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# FINAL
# APPENDIX A

## ADDENDUM
## TO THE FINAL BASELINE RISK ASSESSMENT
## OF THE WOOLFOLK CHEMICAL WORKS SITE

## OPERABLE UNIT #2

**Prepared for Clean Sites, Inc.**

**For submittal to:**
**U.S. Environmental Protection Agency**

**July 5, 1995**

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## Table of Contents


1.0 INTRODUCTION ..... 1-1
1.1 Site Background ..... 1-1
1.1.1 Overall Description of the Woolfolk Chemical Works Site ..... 1-1
1.1.2 Overall Description of the Woolfolk OU-2 Site ..... 1-1

2.0 IDENTIFICATION OF THE CHEMICALS OF CONCERN ..... 2-1
2.1 Chemicals of Concern in Soils ..... 2-2
2.1.1 Metals ..... 2-2
2.1.2 Pesticides ..... 2-3
2.1.3 Semi-Volatile Organic Chemicals and Polynuclear Aromatic Hydrocarbons (PAHs) ..... 2-3
2.1.4 Evaluation of Chemicals Detected in Soil Based on USEPA Soil Screening Levels and Other Criteria ..... 2-5
2.2 Summary of the Chemicals of Concern for Woolfolk OU-2 ..... 2-5

3.0 EXPOSURE ASSESSMENT ..... 3-1
3.1 Exposure Pathway Analysis ..... 3-1
3.1.1 Surface Soils ..... 3-2
3.1.2 Surface and Subsurface Soils ..... 3-2
3.2 Quantification of Exposure ..... 3-5
3.2.1 Estimation of Chemical Intakes ..... 3-5
3.3 Exposure Estimates for Individuals Potentially Exposed to the Chemicals of Concern Under Current and Planned Future Land Use Conditions ..... 3-6

4.0 TOXICITY ASSESSMENT ..... 4-1
4.1 Noncarcinogenic Risks ..... 4-1
4.2 Carcinogenic Risks ..... 4-2
4.3 Toxicological Effects of Lead ..... 4-3

5.0 RISK CHARACTERIZATION ..... 5-1
5.1 Risk Characterization for Current OU-2 Conditions ..... 5-1
5.2 Risk Characterization for Future OU-2 Conditions ..... 5-2
5.3 Evaluation of Risk Assessment Uncertainties ..... 5-3
5.3.1 Uncertainties Related to Estimation of Exposure ..... 5-3
5.3.2 Uncertainties Related to Estimation of Risk ..... 5-7

6.0 SUMMARY AND CONCLUSIONS ..... 6-1

7.0 REFERENCES ..... 7-1

Attachment A Integrated Exposure Uptake Biokinetic Model Blood Lead Calculations

Attachment B Soil Action Levels for the Chemicals of Concern

## List of Tables

Table 2-1 Summary of Surface Soil Data Woolfolk OU-2 ..... 2-7
Table 2-2 Summary of Surface and Subsurface Soil Data Woolfolk OU-2 ..... 2-9
Table 2-3 Comparison of All Chemicals Not Initially Selected as a Chemical of Concern to USEPA Residential Soil Screening Levels-Woolfolk OU-2 ..... 2-11

Table 3-1 Calculation of Intakes of the Chemicals of Concern in Soil ..... 3-7
Table 3-2 Exposure Assumptions ..... 3-9
Table 3-3 Current Maintenance Worker-Exposure to Chemicals in Surface Soils-Average Daily Intakes ..... 3-11
Table 3-4 Current Child Trespasser-Exposure Chemicals in Surface Soils -Average Daily Intakes ..... 3-12
Table 3-5 Current Off-site Child Resident-Exposure to Chemicals in Surface Soils -Average Daily Intakes ..... 3-13
Table 3-6 Future Maintenance Worker-Exposure to Chemicals in Surface and Subsurface Soils-Average Daily Intakes - Average Daily Intakes ..... 3-14
Table 3-7 Future Child Patron-Exposure to Chemicals in Surface and Subsurface Soils-Average Daily Intakes -Average Daily Intakes ..... 3-15
Table 3-8 Future Construction Worker -Exposure to Chemicals in Surface and Subsurface Soils-Average Daily Intakes - Average Daily Intakes ..... 3-16
Table 3-9 Future Institutional Worker -Exposure to Chemicals in Surface and Subsurface Soils-Average Daily Intakes - Average Daily Intakes ..... 3-17

Table 4-1 Inhalation Reference Doses and Slope Factors for the Chemicals of Concern ..... 4-4
Table 4-2 Oral Reference Doses and Slope Factors for the Chemicals of Concern ..... 4-6

**List of Tables** (continued)


Table 5-1 Current Maintenance Worker-Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface Soils....5-10

Table 5-2 Current Child Trespasser-Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface Soils....5-11

Table 5-3 Current Off-Site Child Resident-Noncarcinogenic and Carcinogenic Risks Associated with Inhalation of Chemicals in Surface Soils....5-12

Table 5-4 Future Maintenance Worker-Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface and Subsurface Soils....5-13

Table 5-5 Future Child Patron-Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface and Subsurface Soils....5-14

Table 5-6 Future Construction Worker-Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface and Subsurface Soils....5-15

Table 5-7 Future Institutional Worker-Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface and Subsurface Soils....5-16

Table 6-1 Risk Summary Table....6-4

# 1.0 INTRODUCTION

This addendum to the Final Baseline Risk Assessment for the Woolfolk Chemical Works Site (IC, 1992) assesses possible human health risks that may result from exposure to chemicals of concern detected in Woolfolk Operable Unit #2 (OU-2) soils. The Woolfolk OU-2 consists of properties located on Martin Luther King Drive, Oak Street, and the former flour mill and Holcomb Tire properties in Fort Valley, Georgia. As requested by USEPA Region IV, this assessment considers current and possible future human exposures to chemicals detected in OU-2 soils. In particular, this addendum considers the planned future use of the OU-2 properties as the site of a community library and other institutions.

## 1.1 Site Background

### 1.1.1 Overall Description of the Woolfolk Chemical Works Site

For a more complete description of the Woolfolk Chemical Works Site (the Facility), the reader is referred to the Final Baseline Risk Assessment of the Woolfolk Chemical Works Site (IC, 1992). The following description is excerpted from that report. The Woolfolk Chemical Works Site is located at Preston and Pine Streets adjacent to the central business district of Fort Valley, Georgia. The Facility is bounded to the northwest by Martin Luther King Drive. Throughout its history, the Facility has produced and packaged a variety of organic and inorganic insecticides, pesticides, and herbicides; during World War II, it was used to produce an inorganic intermediate (arsenic trichloride) for the U.S. Army. Historic operations have resulted in both groundwater and soil contamination.

### 1.1.2 Overall Description of the Woolfolk OU-2 Site

In December 1993, the EPA issued a Unilateral Administrative Order (UAO) for removal activities. The UAO specified two options for the "disassociation of residents" from areas where certain soil cleanup levels were exceeded. The first option was the temporary relocation of residents and excavation of soil that exceeded action levels and restoration of properties. The second option was the purchase of properties, permanent relocation of residents and fencing of the affected properties.

As a result of the UAO, some of these properties were purchased by Canadyne-Georgia Corporation and the existing structures demolished. Those properties may be donated to the City of Fort Valley by Canadyne-Georgia for a proposed redevelopment project. The OU-2 site consists of those properties that may be donated as other properties on Martin Luther King Drive and Oak Street, the former flour mill property, and the Holcomb Tire property. Soils were analyzed for metals, pesticides, and semivolatile organic chemicals

in keeping with the chemicals of concern for the Woolfolk Chemical Works site surface soils. Volatile organic chemicals were not chemicals of concern for surface soils at the Woolfolk Chemical Works Facility.

## 2.0 IDENTIFICATION OF THE CHEMICALS OF CONCERN

The purpose of this section of the risk assessment is to determine the chemicals in soil that will be considered in the risk assessment. Soil data used in this risk assessment are from investigations conducted during remedial activities near the Woolfolk Facility. Most of the samples from the investigation of OU-2 soils were taken from the top 6 inches of soil (surface soils, Table 2-1). However, two samples taken from three feet below ground surface (bgs) were included in the data analysis. The combined summary of surface and subsurface soil sampling results is presented in Table 2-2.

The chemicals of concern in soil for OU-2 soil are determined based on a comparison of the concentrations of detected chemicals relative to "background." Conservatively, chemicals in surface soils or subsurface soils are eliminated from this risk assessment only if: 1) chemicals are detected in less than 5% of the samples analyzed or; 2) the detected concentrations of the chemical in soil is similar to background concentrations typically detected in urban environments.

Comparison of OU-2 soil data to "background" concentrations is particularly relevant for metals and polynuclear aromatic hydrocarbons (PAHs). Certain metals and PAHs are known to be present in elevated concentrations in urban soils (Bradley et al., 1994). This is particularly important for areas near highways since both metals and PAHs have been present in automobile emissions, resulting in elevated soil concentrations near highways. Based on the historical release of metals and PAHs from vehicle emissions and the fact that Martin Luther King Drive is a heavily traveled road in Fort Valley, soil metal and PAH concentrations in OU-2 soils are compared to typical urban background.

As an additional screening procedure, soil concentrations of chemicals not initially selected as chemicals of concern were compared to USEPA soil screening levels (SSLs). The USEPA defines the SSL below:

> "A Soil Screening Level is a chemical concentration in soil that represents a level of contamination below which there is no concern under CERCLA, provided conditions associated with the SSLs are met. Generally, if contaminant concentrations in soil fall below the SSL, and there are no significant ecological receptors of concern, then no further study or action is warranted for residential use of that area. Concentrations in soil above either the generic or site-specific screening level would not automatically designate a site as "dirty" or trigger a response action. However, exceeding a screening level suggests that a further evaluation of the potential risks that may be posed by site contaminants is appropriate to determine the need for response action." (USEPA, 1994a)

Thus, SSLs can reasonably be used to identify or eliminate chemicals as chemicals of concern for the risk assessment.

Lastly, chemicals detected in OU-2 soils were compared to USEPA-approved chemicals of concern selected in the Baseline Risk Assessment for the Woolfolk Chemical Works Facility (IC, 1992). The baseline risk assessment was used to identify chemicals that may originate from the Woolfolk Chemical Works Facility and therefore be of concern.

A discussion of the screening procedure used to determine the chemicals of concern in soil for the Woolfolk OU-2 is presented below.

## 2.1 Chemicals of Concern in Soils

### 2.1.1 Metals

Thirteen metals were detected in Woolfolk OU-2 soils. Due to the history of the Woolfolk Facility in formulating pesticides containing arsenic and lead, these metals were retained as chemicals of concern. Average concentrations of barium, beryllium, chromium, cobalt, copper, manganese, nickel, and vanadium in OU-2 soils were less than reported average concentrations in eastern U.S. soils (see table of comparisons below). Only average concentrations of mercury and zinc were above eastern U.S. averages. However, because the background data used for the comparison are not site-specific, detected metal concentrations in OU-2 soils were also compared to USEPA SSLs (Table 2-3). This comparison is discussed in Section 2.1.4 of this appendix.

**Comparison of Soil Metal Concentrations to Reported Background Concentrations**

| Chemical | Average Concentration Detected in OU-2 Soils (mg/kg) | Maximum Concentration Detected in OU-2 Soils (mg/kg) | Average Concentration in Eastern U.S. Soils (mg/kg) [a] | Range of Concentrations Detected in Eastern U.S. Soils (mg/kg) [a] |
|---|---|---|---|---|
| Barium | 76 | 170 | 420 | 10 - 1500 |
| Beryllium | 0.40 | 0.67 | 0.85 | <1 - 7 |
| Cadmium | 0.90 | 1.1 | - | - |
| Chromium | 19.8 | 160 | 52 | 1 - 1000 |
| Cobalt | 2.4 | 4 | 9.2 | <0.3 - 70 |
| Copper | 20 | 130 | 22 | <1 - 700 |
| Manganese | 187 | 610 | 640 | <2 - 7000 |
| Mercury | 0.23 | 0.4 | 0.12 | 0.01 - 3.4 |
| Nickel | 4.9 | 10.3 | 18 | <5 - 700 |
| Vanadium | 24.5 | 106 | 66 | <7 - 300 |
| Zinc | 158 | 610 | 52 | <5 - 2900 |

a Adapted from Shacklette and Boerngen (1984) - Not available

### 2.1.2 Pesticides

Pesticides were detected in all soil samples analyzed at concentrations ranging from 0.009 mg/kg (alpha-BHC) to 5.6 mg/kg (DDE). Given the history of the Woolfolk facility as a pesticide formulator, the 18 pesticides detected in soil were retained as chemicals of concern in Woolfolk OU-2 soil. PCB-1254 was also detected in two soil samples and was retained as a chemical of concern for Woolfolk OU-2 soils.

### 2.1.3 Semi-Volatile Organic Chemicals and Polynuclear Aromatic Hydrocarbons (PAHs)

Fourteen PAHs and three semi-volatile organic chemicals were detected in surface soils. With the exception of carbazole and dibenzofuran, all 17 chemicals have been associated with urban soil.

As a result of both anthropogenic and natural sources, PAHs are ubiquitous in soil. The highest concentrations of PAHs in soil are detected in urban versus agricultural or rural soils. Perhaps the most systematic study conducted to date to evaluate background concentrations of PAHs in urban soils is that of Bradley et al. (1994). Bradley et al. (1994) collected a total of 60 soil samples in urban New England soils; 42 of the surface soil samples were collected within 4 to 6 feet of pavement and 18 were not. A summary of the findings of Bradley et al. (1994) is presented in the table below. With the exception of 2-methylnaphthalene and naphthalene, maximum detected PAH concentrations in OU-2 soils were within a factor of two or below the average concentration of PAHs detected in the Bradley et al. study.

**Comparison of PAH Soil Concentrations from Woolfolk OU-2 With Typical Urban Soil Concentrations**

| PAH | *Woolfolk OU-2 Soils (mg/kg) | Reported PAH Concentrations for Urban Soils | | | | |
|---|---|---|---|---|---|---|
| | | Minimum detect (mg/kg) | Maximum detect (mg/kg) | Arithmetic mean (mg/kg) | Upper 95% interval (mg/kg) | [a]Frequency of detection |
| Acenaphthylene | 0.11 | 0.018 | 1.10 | 0.173 | 0.208 | 24 / 62 |
| Anthracene | 0.094 | 0.029 | 5.70 | 0.351 | 0.535 | 54 / 62 |
| Benzo(a)anthracene | 1.2 | 0.048 | 15.00 | 1.319 | 1.858 | 58 / 62 |
| Benzo(a)pyrene | 1.3 | 0.040 | 13.00 | 1.323 | 1.816 | 57 / 62 |
| Benzo(b)fluoranthene | 1.5 | 0.049 | 12.00 | 1.435 | 1.973 | 55 / 62 |
| Benzo(g,h,i)perylene | 0.73 | 0.200 | 5.90 | 0.891 | 1.195 | 36 / 62 |
| Benzo(k)fluoranthene | 1.5 | 0.043 | 25.00 | 1.681 | 2.522 | 59 / 62 |
| Chrysene | 1.4 | 0.038 | 21.00 | 1.841 | 2.693 | 60 / 62 |
| Fluoranthene | 1.2 | 0.110 | 39.00 | 3.047 | 4.444 | 60 / 62 |
| Indeno(1,2,3-c,d) pyrene | 0.8 | 0.093 | 6.00 | 0.987 | 1.293 | 43 / 62 |
| 2-Methylnaphthalene | 1.2 | 0.017 | 0.64 | 0.151 | 0.173 | 19 / 62 |
| Naphthalene | 0.88 | 0.018 | 0.66 | 0.125 | 0.149 | 35 / 62 |
| Phenanthrene | 0.52 | 0.071 | 36.00 | 1.838 | 2.982 | 61 / 62 |
| Pyrene | 1.7 | 0.082 | 11.00 | 2.398 | 2.945 | 61 / 62 |

Adapted from Bradley et al. (1994)
*Maximum detected concentration in OU-2 soils
a Frequency of detection = number detected/number samples.

Carbazole was detected in only one of twenty-six samples at a concentration of 0.038 mg/kg. Given that it was detected in less than 5% of the samples analyzed at a low concentration, carbazole was eliminated as a chemical of concern in soil.

Dibenzofuran was detected in 2 of 26 soil samples at a maximum concentration of 0.08 mg/kg. No information could be found relating to dibenzofuran concentrations in urban soil. However, given the very low concentrations detected and the relatively low frequency of detection, dibenzofuran was eliminated as a chemical of concern. Further, dibenzofuran is not considered by the USEPA to be a probable or potential human carcinogen.

Naphthalene and 2-methylnaphthalene were detected in 15 and 12 of 26 samples at maximum concentrations of 0.88 and 1.2 mg/kg, respectively. These structurally similar chemicals enter the atmosphere primarily from fugitive emissions and exhaust connected with production and use of fuel oil and gasoline. The primary source of exposure to humans is from air, especially in areas of heavy traffic. Naphthalene and 2-methylnaphthalene are also formed when natural products such as wood or tobacco are burned. Although the maximum concentrations of naphthalene and 2-methylnaphthalene were slightly higher than the levels detected in urban

soils, they are not associated with pesticide formulation and are likely to be from some other anthropogenic source.

Benzoic acid was detected in one of five samples at a concentration of 0.12 mg/kg. Benzoic acid may be released into the environment as emissions from auto exhaust, refuse combustion, and tobacco smoke. Benzoic acid is also widely distributed in nature and naturally occurs in foods such as berries. Benzoic acid is a common food additive, being used as food preservatives at concentrations of 0.1% (Howard, 1989). Given the low concentration detected and its ubiquitous nature, benzoic acid was eliminated as a chemical of concern in soil. Benzoic acid is not considered to be a probable or potential human carcinogen by the USEPA.

Bis(2-ethylhexyl)phthalate was detected in three of 26 samples at a maximum concentration of 0.16 mg/kg. Bis(2-ethylhexyl)phthalate is a man-made chemical that is commonly added to plastics to make them flexible. It is present in plastic products such as food packaging materials, children's toys, flexible tubing, plastic bags and especially vinyl materials at concentrations reaching nearly 40% (ATSDR, 1993). It is also a common laboratory contaminant. Bis(2-ethylhexyl)phthalate can leach from plastic materials into the environment and can be released from burning plastic.

### 2.1.4 Evaluation of Chemicals Detected in Soil Based on USEPA Soil Screening Levels and Other Criteria

Based on the Woolfolk Chemical Works site history, arsenic, lead, and the pesticides were selected as chemicals of concern for OU-2 soils. Table 2-3 compares USEPA SSLs to maximum and average detected concentrations for all other chemicals.

Only beryllium, benzo(a)anthracene, benzo(a)pyrene, and benzo(b and/or k)fluoranthene were above USEPA SSLs. Despite the fact that benzo(a)anthracene, benzo(a)pyrene, and benzo(b and/or k)fluoranthene were detected at concentrations similar to typical urban background levels, these potentially carcinogenic PAHs were retained as chemicals of concern.

Although beryllium exceeded its SSL concentration, it was not selected as a chemical of concern for the Woolfolk Chemical Works Facility baseline risk assessment. There is no known use of beryllium as a pesticide, and the concentrations detected are generally representative of typical background concentrations.

## 2.2 Summary of the Chemicals of Concern for Woolfolk OU-2

The chemicals of concern selected for detailed analyses in this risk assessment are listed below. These chemicals were selected for the following reasons: (1)

frequent detection in soil, (2) presence in soil exceeding background levels, (3) the potential to cause adverse human health effects, (4) persistence and/or mobility in the environment, and (5) history of contamination at the Woolfolk facility.

Chemicals of Concern in OU-2 Soils

| Metals | Semivolatile Organic Chemicals | Pesticides |
|---|---|---|
| Arsenic | Benzo(a)anthracene | Aldrin |
| Lead | Benzo(a)pyrene | BHC-alpha |
| | Benzo(b and/or k)fluoranthene | BHC-delta |
| | | BHC-gamma |
| | | Chlordane-alpha |
| | | Chlordane-gamma |
| | | DDD |
| | | DDE |
| | | DDT |
| | | Dieldrin |
| | | Endosulfan I |
| | | Endosulfan II |
| | | Endrin ketone |
| | | Heptachlor |
| | | Heptachlor epoxide |
| | | Methoxychlor |
| | | PCB-1254 |
| | | Toxaphene |

**Table 2-1**
**Summary of Surface Soil Data**
**Woolfolk OU-2**

| Chemical | Number of Detects/Number of Samples Analyzed | Arithmetic Mean of Detects (mg/kg) | Maximum of Detects (mg/kg) | 95% UCL (mg/kg) | Exposure Point Concentration (mg/kg) |
|---|---|---|---|---|---|
| **Metals** | | | | | |
| Arsenic | 41 / 44 | 4.44E+01 | 1.80E+02 | 7.55E+01 | 7.55E+01 |
| Barium | 39 / 40 | 7.71E+01 | 1.70E+02 | NC | NC |
| Beryllium | 20 / 40 | 4.01E-01 | 6.70E-01 | NC | NC |
| Cadmium | 6 / 44 | 8.97E-01 | 1.10E+00 | NC | NC |
| Chromium | 40 / 40 | 1.84E+01 | 1.60E+02 | NC | NC |
| Cobalt | 27 / 40 | 2.37E+00 | 4.00E+00 | NC | NC |
| Copper | 39 / 40 | 2.03E+01 | 1.30E+02 | NC | NC |
| Lead | 43 / 43 | 1.93E+02 | 5.70E+02 | NC | [a]1.93E+02 |
| Manganese | 39 / 39 | 1.89E+02 | 6.10E+02 | NC | NC |
| Mercury | 22 / 40 | 2.30E-01 | 4.00E-01 | NC | NC |
| Nickel | 27 / 40 | 4.73E+00 | 9.20E+00 | NC | NC |
| Vanadium | 39 / 40 | 2.08E+01 | 5.60E+01 | NC | NC |
| Zinc | 40 / 40 | 1.65E+02 | 6.10E+02 | NC | NC |
| **Semivolatile organic chemicals** | | | | | |
| Acenaphthylene | 2 / 24 | 9.40E-02 | 1.10E-01 | NC | NC |
| Anthracene | 4 / 24 | 5.63E-02 | 9.40E-02 | NC | NC |
| Benzo(a)anthracene | 11 / 24 | 2.21E-01 | 1.20E+00 | 2.64E-01 | 2.64E-01 |
| Benzo(a)pyrene | 10 / 24 | 2.66E-01 | 1.30E+00 | 2.61E-01 | 2.61E-01 |
| Benzo(b and/or k)fluoranthene | 11 / 24 | 3.84E-01 | 1.50E+00 | 3.50E-01 | 3.50E-01 |
| Benzo(g,h,i)perylene | 6 / 24 | 2.69E-01 | 7.30E-01 | NC | NC |
| Benzoic acid | 1 / 3 | 1.20E-01 | 1.20E-01 | NC | NC |
| Bis(2-ethylhexyl)phthalate | 2 / 24 | 1.15E-01 | 1.60E-01 | NC | NC |
| Carbazole | 1 / 24 | 3.80E-02 | 3.80E-02 | NC | NC |
| Chrysene | 14 / 24 | 2.59E-01 | 1.40E+00 | NC | NC |
| Dibenzofuran | 2 / 24 | 6.60E-02 | 8.10E-02 | NC | NC |
| Fluoranthene | 18 / 24 | 2.17E-01 | 1.20E+00 | NC | NC |
| Indeno(1,2,3-c,d)pyrene | 6 / 24 | 2.60E-01 | 8.00E-01 | NC | NC |

**Table 2-1**
**Summary of Surface Soil Data**
**Woolfolk OU-2**

| Chemical | Number of Detects/Number of Samples Analyzed | Arithmetic Mean of Detects (mg/kg) | Maximum of Detects (mg/kg) | 95% UCL (mg/kg) | Exposure Point Concentration (mg/kg) |
|---|---|---|---|---|---|
| Methylnaphthalene (2-) | 12 / 24 | 2.47E-01 | 1.20E+00 | NC | NC |
| Naphthalene | 15 / 24 | 1.60E-01 | 8.80E-01 | NC | NC |
| Phenanthrene | 17 / 24 | 1.75E-01 | 5.20E-01 | NC | NC |
| Pyrene | 10 / 24 | 3.34E-01 | 1.70E+00 | NC | NC |
| **Pesticides** | | | | | |
| Aldrin | 2 / 25 | 1.28E-02 | 2.20E-02 | 9.48E-03 | 9.48E-03 |
| BHC-alpha | 5 / 25 | 4.32E-03 | 8.90E-03 | 7.02E-03 | 7.02E-03 |
| BHC-beta | 9 / 25 | 4.94E-02 | 3.30E-01 | 2.90E-02 | 2.90E-02 |
| BHC-delta | 3 / 25 | 4.70E-02 | 1.30E-01 | 1.50E-02 | 1.50E-02 |
| BHC-gamma | 3 / 25 | 1.72E-02 | 4.30E-02 | 9.26E-03 | 9.26E-03 |
| Chlordane-alpha | 10 / 25 | 2.58E-01 | 5.90E-01 | 8.98E-01 | 5.90E-01 |
| Chlordane-gamma | 12 / 25 | 3.86E-01 | 1.60E+00 | 1.23E+00 | 1.23E+00 |
| DDD | 3 / 3 | 3.60E-02 | 5.80E-02 | 4.05E-01 | 5.80E-02 |
| DDE | 23 / 25 | 7.82E-01 | 5.60E+00 | 3.40E+00 | 3.40E+00 |
| DDT | 25 / 25 | 7.78E-01 | 4.50E+00 | 4.21E+00 | 4.21E+00 |
| Dieldrin | 15 / 25 | 3.07E-01 | 1.50E+00 | 4.91E-01 | 4.91E-01 |
| Endosulfan I | 1 / 25 | 1.60E-01 | 1.60E-01 | 1.29E-02 | 1.29E-02 |
| Endosulfan II | 2 / 25 | 5.60E-02 | 1.00E-01 | 3.25E-02 | 3.25E-02 |
| Endrin ketone | 3 / 25 | 4.49E-02 | 1.00E-01 | 4.04E-02 | 4.04E-02 |
| Heptachlor | 8 / 25 | 2.19E-02 | 1.00E-01 | 1.72E-02 | 1.72E-02 |
| Heptachlor epoxide | 7 / 25 | 2.86E-01 | 1.00E+00 | 2.07E-01 | 2.07E-01 |
| Methoxychlor | 2 / 25 | 4.85E-02 | 5.30E-02 | 8.87E-02 | 5.30E-02 |
| PCB-1254 | 2 / 25 | 3.45E-01 | 4.60E-01 | 1.42E-01 | 1.42E-01 |
| Toxaphene | 9 / 25 | 1.11E+00 | 3.40E+00 | 9.45E-01 | 9.45E-01 |

NC = not calculated

a = arithmetic mean concentration used as exposure point concentration for IEUBK model.

Table 2-2
Summary of Surface and Subsurface Soil Data
Woolfolk OU-2

| Chemical | Number of Detects/Number of Samples Analyzed | Arithmetic Mean of Detects (mg/kg) | Maximum of Detects (mg/kg) | 95% UCL (mg/kg) | Exposure Point Concentration (mg/kg) |
|---|---|---|---|---|---|
| **Metals** | | | | | |
| Arsenic | 42 / 45 | 4.35E+01 | 1.80E+02 | 7.36E+01 | 7.36E+01 |
| Barium | 40 / 42 | 7.64E+01 | 1.70E+02 | NC | NC |
| Beryllium | 20 / 42 | 4.01E-01 | 6.70E-01 | NC | NC |
| Cadmium | 6 / 46 | 8.97E-01 | 1.10E+00 | NC | NC |
| Chromium | 42 / 42 | 1.98E+01 | 1.60E+02 | NC | NC |
| Cobalt | 27 / 42 | 2.37E+00 | 4.00E+00 | NC | NC |
| Copper | 40 / 42 | 2.00E+01 | 1.30E+02 | NC | NC |
| Lead | 44 / 44 | 1.89E+02 | 5.70E+02 | NC | [a]1.89E+02 |
| Manganese | 40 / 40 | 1.87E+02 | 6.10E+02 | NC | NC |
| Mercury | 22 / 42 | 2.30E-01 | 4.00E-01 | NC | NC |
| Nickel | 28 / 42 | 4.93E+00 | 1.03E+01 | NC | NC |
| Vanadium | 41 / 42 | 2.45E+01 | 1.06E+02 | NC | NC |
| Zinc | 42 / 42 | 1.58E+02 | 6.10E+02 | NC | NC |
| **Semivolatile organic chemicals** | | | | | |
| Acenaphthylene | 2 / 26 | 9.40E-02 | 1.10E-01 | NC | NC |
| Anthracene | 4 / 26 | 5.63E-02 | 9.40E-02 | NC | NC |
| Benzo(a)anthracene | 11 / 26 | 2.21E-01 | 1.20E+00 | 2.57E-01 | 2.57E-01 |
| Benzo(a)pyrene | 10 / 26 | 2.66E-01 | 1.30E+00 | 2.54E-01 | 2.54E-01 |
| Benzo(b and/or k)fluoranthene | 11 / 26 | 3.84E-01 | 1.50E+00 | 3.30E-01 | 3.30E-01 |
| Benzo(g,h,i)perylene | 6 / 26 | 2.69E-01 | 7.30E-01 | NC | NC |
| Benzoic acid | 1 / 5 | 1.20E-01 | 1.20E-01 | NC | NC |
| Bis(2-ethylhexyl)phthalate | 3 / 26 | 9.10E-02 | 1.60E-01 | NC | NC |
| Carbazole | 1 / 26 | 3.80E-02 | 3.80E-02 | NC | NC |
| Chrysene | 14 / 26 | 2.59E-01 | 1.40E+00 | NC | NC |
| Dibenzofuran | 2 / 26 | 6.60E-02 | 8.10E-02 | NC | NC |
| Fluoranthene | 18 / 26 | 2.17E-01 | 1.20E+00 | NC | NC |

**Table 2-2**
**Summary of Surface and Subsurface Soil Data**
**Woolfolk OU-2**

| Chemical | Number of Detects/Number of Samples Analyzed | Arithmetic Mean of Detects (mg/kg) | Maximum of Detects (mg/kg) | 95% UCL (mg/kg) | Exposure Point Concentration (mg/kg) |
|---|---|---|---|---|---|
| Indeno(1,2,3-c,d)pyrene | 6 / 26 | 2.60E-01 | 8.00E-01 | NC | NC |
| Methylnaphthalene (2-) | 12 / 26 | 2.47E-01 | 1.20E+00 | NC | NC |
| Naphthalene | 15 / 26 | 1.60E-01 | 8.80E-01 | NC | NC |
| Phenanthrene | 17 / 26 | 1.75E-01 | 5.20E-01 | NC | NC |
| Pyrene | 10 / 26 | 3.34E-01 | 1.70E+00 | NC | NC |
| **Pesticides** | | | | | |
| Aldrin | 2 / 27 | 1.28E-02 | 2.20E-02 | 9.78E-03 | 9.78E-03 |
| BHC-alpha | 5 / 27 | 4.32E-03 | 8.90E-03 | 7.53E-03 | 7.53E-03 |
| BHC-beta | 10 / 27 | 4.94E-02 | 3.30E-01 | 3.10E-02 | 3.10E-02 |
| BHC-delta | 3 / 27 | 4.70E-02 | 1.30E-01 | 1.44E-02 | 1.44E-02 |
| BHC-gamma | 3 / 27 | 1.72E-02 | 4.30E-02 | 9.64E-03 | 9.64E-03 |
| Chlordane-alpha | 10 / 27 | 2.58E-01 | 5.90E-01 | 7.43E-01 | 5.90E-01 |
| Chlordane-gamma | 12 / 27 | 3.86E-01 | 1.60E+00 | 9.67E-01 | 9.67E-01 |
| DDD | 3 / 4 | 3.60E-02 | 5.80E-02 | 1.21E-01 | 5.80E-02 |
| DDE | 24 / 27 | 7.55E-01 | 5.60E+00 | 3.08E+00 | 3.08E+00 |
| DDT | 27 / 27 | 7.31E-01 | 4.50E+00 | 3.43E+00 | 3.43E+00 |
| Dieldrin | 15 / 27 | 3.07E-01 | 1.50E+00 | 3.94E-01 | 3.94E-01 |
| Endosulfan I | 1 / 27 | 1.60E-01 | 1.60E-01 | 1.28E-02 | 1.28E-02 |
| Endosulfan II | 2 / 27 | 5.60E-02 | 1.00E-01 | 3.08E-02 | 3.08E-02 |
| Endrin ketone | 3 / 27 | 4.49E-02 | 1.00E-01 | 3.75E-02 | 3.75E-02 |
| Heptachlor | 8 / 27 | 2.19E-02 | 1.00E-01 | 1.62E-02 | 1.62E-02 |
| Heptachlor epoxide | 7 / 27 | 2.86E-01 | 1.00E+00 | 1.59E-01 | 1.59E-01 |
| Methoxychlor | 2 / 27 | 4.85E-02 | 5.30E-02 | 9.10E-02 | 5.30E-02 |
| PCB-1254 | 2 / 27 | 3.45E-01 | 4.60E-01 | 1.53E-01 | 1.53E-01 |
| Toxaphene | 10 / 27 | 1.07E+00 | 3.40E+00 | 8.95E-01 | 8.95E-01 |

NC = not calculated

a = arithmetic mean concentration used as exposure point concentration for IEUBK model.

**Table 2-3**
**Comparison of All Chemicals Not Initially Selected as a Chemical of Concern to USEPA Residential Soil Screening Levels**
**Woolfolk OU-2**

| | OU-2 Data Summary | | | *Pathway Specific Values for Surface Soils | | |
|---|---|---|---|---|---|---|
| **Chemical** | Number of Detects/Number of Samples Analyzed | Arithmetic Mean of Detects (mg/kg) | Maximum of Detects (mg/kg) | USEPA Residential SSL | Does the Maximum Detected Concentration Exceed the USEPA SSL? | Does the Mean Concentration Exceed the USEPA SSL? |
| **Metals** | | | | | | |
| Barium | 40 / 42 | 7.64E+01 | 1.70E+02 | 5.50E+03 | no | no |
| Beryllium | 20 / 42 | 4.01E-01 | 6.70E-01 | 1.00E-01 | ••yes•• | ••yes•• |
| Cadmium | 6 / 46 | 8.97E-01 | 1.10E+00 | 3.90E+01 | no | no |
| Chromium | 42 / 42 | 1.98E+01 | 1.60E+02 | 3.90E+02 | no | no |
| Cobalt | 27 / 42 | 2.37E+00 | 4.00E+00 | NA | NA | NA |
| Copper | 40 / 42 | 2.00E+01 | 1.30E+02 | NA | NA | NA |
| Manganese | 40 / 40 | 1.87E+02 | 6.10E+02 | NA | NA | NA |
| Mercury | 22 / 42 | 2.30E-01 | 4.00E-01 | 2.30E+01 | no | no |
| Nickel | 28 / 42 | 4.93E+00 | 1.03E+01 | 1.60E+03 | no | no |
| Vanadium | 41 / 42 | 2.45E+01 | 1.06E+02 | 5.50E+02 | no | no |
| Zinc | 42 / 42 | 1.58E+02 | 6.10E+02 | 2.30E+04 | no | no |
| **Semivolatile organic chemicals** | | | | | | |
| Acenaphthylene | 2 / 26 | 9.40E-02 | 1.10E-01 | NA | no | no |
| Anthracene | 4 / 26 | 5.63E-02 | 9.40E-02 | 2.30E+04 | no | no |
| Benzo(a)anthracene | 11 / 26 | 2.21E-01 | 1.20E+00 | 9.00E-01 | ••yes•• | no |
| Benzo(a)pyrene | 10 / 26 | 2.66E-01 | 1.30E+00 | 9.00E-02 | ••yes•• | ••yes•• |
| Benzo(b and/or k)fluoranthene | 11 / 26 | 3.84E-01 | 1.50E+00 | 9.00E-01 | ••yes•• | no |
| Benzo(g,h,i)perylene | 6 / 26 | 2.69E-01 | 7.30E-01 | NA | NA | NA |
| Benzoic acid | 1 / 5 | 1.20E-01 | 1.20E-01 | 3.10E+05 | no | no |
| Bis(2-ethylhexyl)phthalate | 3 / 26 | 9.10E-02 | 1.60E-01 | 4.60E+01 | no | no |
| Carbazole | 1 / 26 | 3.80E-02 | 3.80E-02 | 3.20E+01 | no | no |
| Chrysene | 14 / 26 | 2.59E-01 | 1.40E+00 | 8.80E+01 | no | no |
| Dibenzofuran | 2 / 26 | 6.60E-02 | 8.10E-02 | NA | NA | NA |
| Fluoranthene | 18 / 26 | 2.17E-01 | 1.20E+00 | 3.10E+03 | no | no |
| Indeno(1,2,3-c,d)pyrene | 6 / 26 | 2.60E-01 | 8.00E-01 | 9.00E-01 | no | no |
| Methylnaphthalene (2-) | 12 / 26 | 2.47E-01 | 1.20E+00 | NA | NA | NA |
| Naphthalene | 15 / 26 | 1.60E-01 | 8.80E-01 | 3.10E+03 | no | no |
| Phenanthrene | 17 / 26 | 1.75E-01 | 5.20E-01 | NA | NA | NA |
| Pyrene | 10 / 26 | 3.34E-01 | 1.70E+00 | 2.30E+03 | no | no |

NA - not applicable (comparison could not be made due to lack of a a soil screening level)
*Based on the lower of either the ingestion or inhalation pathway soil screening levels

## 3.0 EXPOSURE ASSESSMENT

The objectives of the exposure assessment are to evaluate potential pathways of human exposure to the chemicals of concern detected in soils at the proposed redevelopment project area on Martin Luther King Drive and Oak Street, soils at the former flour mill property, and soils at the Holcomb Tire property. These areas are collectively known as Operable Unit #2 (OU-2). Once complete exposure pathways are identified, chemical intakes associated with each pathway and each potentially exposed population are calculated. This section analyzes exposure conditions associated with current and future use of the OU-2 properties.

Human exposure to the chemicals present in soil may occur via three routes; ingestion, inhalation, and skin contact. Under both current and future exposure conditions, soil exposure was assumed to occur in the absence of wearing personal protection equipment such as respirators or special clothing. Under future conditions, the impact of paving a portion of the proposed redevelopment area on future soil exposure is taken into account.

This exposure assessment calculates chemical intakes for potentially exposed populations which could be considered representative of "reasonable maximum exposures" (RME). For RME estimates, exposure assumptions and parameters are selected to represent the 90th or 95th percentile for various assumptions including duration of exposure, years exposed, exposure point concentrations, and others. The intent of the RME scenario is to calculate chemical intakes which would not underestimate exposure under conservative exposure conditions.

### 3.1 Exposure Pathway Analysis

As stated by the USEPA, an exposure pathway "describes the course a chemical or physical agent takes from the source to the exposed individual. An exposure pathway analysis links the sources, locations, and types of environmental releases with population locations and activity patterns to determine the significant pathways of human exposure" (USEPA 1989a).

An exposure pathway is made up of four elements. These are:

- A source and mechanism of chemical release,
- A retention or transport medium,
- A point of potential human contact with the contaminated medium, and;
- An exposure route at the contact point.

In the following discussion, exposure pathways to site chemicals in soil are identified. In part, selection of these exposure pathways are based on the planned future use of the redevelopment property, which will be the site of a community library and another institution. Designation of an exposure pathway as "complete" indicates that human exposure is possible, but does not necessarily mean that exposure will actually occur. Possible pathways of exposure are discussed in the following sections.

### 3.1.1 Surface Soils

In its current state, individuals may have direct contact with OU-2 surface soils. Trespassers and maintenance workers in the OU-2 areas could ingest soil and have skin contact with OU-2 soils. In addition, these individuals may be exposed to fugitive dusts that may be released from unvegetated or uncovered OU-2 soils. For this reason, a maintenance worker and a trespassing child were considered to be potentially exposed to chemicals in OU-2 surface soils by the ingestion, skin contact, and inhalation routes of exposure.

In addition, nearby off-site residents may also be inhale dusts released from OU-2 soils that are transported from the site. For this reason, inhalation exposure for an off-site resident is also assessed. A young child resident is evaluated as the most sensitive off-site receptor because the amount of air inhaled relative to body weight is higher for a child than an adult. Because off-site residents are unlikely to have direct skin contact with OU-2 soils, the ingestion and skin contact exposure pathways are considered incomplete for the current off-site child resident.

In summary, under current site conditions, the following exposure pathways were considered to be complete:

<u>On-site Maintenance Worker</u>
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

<u>On-site Child Trespasser</u>
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

<u>Off-site Child Resident</u>
Inhalation of chemicals in OU-2 surface soils

### 3.1.2 Surface and Subsurface Soils

Given that excavation of soil may be necessary for future construction that may occur in OU-2, subsurface soil results were also included to assess possible future exposure to chemicals in soil. Chemicals in subsurface soils may be brought to the surface during excavation and construction activities,

resulting in possible human exposure. For this reason, two subsurface soil samples collected in OU-2 at the Holcomb Tire property are also included as being representative of possible future soil exposure conditions.

The area of OU-2 along Martin Luther King Drive is the proposed future site of a public library and an institution. Plans indicate that the new library site will occupy approximately 600 feet of frontage along Martin Luther King Drive. According to the proposed plan, the library will be accessible from driveways on Martin Luther King Drive and Oak Street. More than 80% of the property will be covered by the library building and a paved parking lot. The rest of the property will be landscaped. The Holcomb Tire property is also paved.

Given that much of the OU-2 soils will be covered by pavement or the library building, the potential for future human contact with chemicals in these soils will be markedly reduced.

Individuals that may be exposed to chemicals in surface and subsurface soils were considered to be a future maintenance worker (such as a groundskeeper), a child visiting the library (child patron), an institutional worker (such as a librarian), and a construction worker.

A construction worker was assumed to be exposed to soils in the absence of any pavement to prevent soil contact. This assumption is reasonable since construction workers would be exposed to soils before the library site is paved.

A future maintenance worker, future child patron, and future institutional worker were assumed to be exposed to soils following completion of the library. Because the amount of exposed soil surface in OU-2 will be reduced by the library building and the associated parking lot, the amount of future soil ingestion accounted for by soils in the OU-2 area was reduced by 0.50. This assumption is quite conservative since 85% of the library site soils will be covered by pavement or a building and because the Holcomb Tire property is also paved.

It is well recognized by the USEPA that paving can reduce human exposure to affected surface soils. For example, with regard to lead in surface soils, the USEPA states that:

> "Increasingly aggressive exposure-reduction activities are warranted at higher soil lead levels, with very high levels indicating that soil abatement may be necessary. For purposes of prioritizing abatements, the Agency recommends soil abatement when lead levels are found at 5000 parts per million or more in residential bare soil. Appropriate activities at this level of lead concentration may include removal and replacement of the soil, the use of more permanent covers (*e.g.*, paving), or other activities." (USEPA, 1994b)

Thus, it is appropriate to use a 0.50 "fraction ingested" (FI) term when assessing soil ingestion exposure from soils in the OU-2 area.

A future institutional worker was considered to have less soil exposure than the future maintenance worker or the future child patron. Unlike the maintenance worker or the child patron, the institutional worker can be assumed to spend almost all of the workday inside of the library building or institution. For this reason, the institutional worker is likely to ingest only soils that have infiltrated the library building or institution from the outside. The USEPA has recommended that a coefficient of 0.70 be used to adjust outdoor soil lead concentrations to an indoor household dust concentration. The USEPA states that:

> "We recommend a default soil-to-dust coefficient of 0.70, which represents some real sites where soil is a major contribution to household dust." (USEPA, 1994b)

and;

> "The current default is appropriate to neighborhoods or residences in which loose particles of surface soil are readily transported into the house." (USEPA, 1994b)

Thus, it is reasonable that for an institutional worker, indoor dust in an building would be only 70% composed of outdoor soil.

As discussed above, the amount of outdoor soil from OU-2 was assumed to be 0.5 based on the amount of affected surface soil that will be paved. For the institutional worker, the amount of ingestion of affected outdoor soil will depend on: 1) the amount of outdoor dust that is released from affected source areas and; 2) the degree to which the affected outdoor dust, once released from an exposed area of soil, infiltrates the indoor environment. The amount of soil ingested from OU-2 soils was reduced to 0.35 (0.5 x 0.7 = 0.35) for the future institutional worker to account for the effect of pavement in reducing the amount of affected soil surface (0.5) and to account for the amount of indoor dust that will be composed of outdoor soil (0.7).

In summary, under future site conditions, the following exposure pathways were considered to be complete:

<u>On-site Maintenance Worker</u>
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

<u>On-site Child Patron</u>
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

On-site Construction Worker
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

On-site Institutional Worker
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

## 3.2 Quantification of Exposure

### 3.2.1 Estimation of Chemical Intakes

Chemical intakes may be calculated for current and future human receptors for each complete exposure pathway once the concentration of the chemical in soil is known and the factors associated with human exposure to soil have been assessed. The USEPA (USEPA, 1992a) directs that the 95 percent upper confidence limit (UCL) on the arithmetic mean concentration of chemicals detected in soil be used to assess exposure. When the 95% UCL on the arithmetic mean exceeds the maximum detected concentration, the maximum detected value is often conservatively used to estimate chemical intake (USEPA, 1992a). The calculated 95% UCLs on the arithmetic mean for the chemicals of concern in surface soil and surface and subsurface soils are presented in Tables 2-1 and 2-2, respectively.

The 95% upper confidence limits on the arithmetic mean concentration for chemicals detected in surface and subsurface soils were calculated according to the formula:

$$95\%\ \mathrm{UCL} = e^{\left(\bar{y} + 0.5\, s^2 + \frac{sH_{1-a}}{\sqrt{n-1}}\right)}$$

where:
e = the exponential function
$\bar{y}$ = arithmetic mean of n log-transformed data measurements
$s^2$ = variance of n log transformed data measurements
$H_{1-a}$ = value looked up in a statistical table. This table was further modified using LaGrangian four-point interpolation to provide additional H values in accord with the method suggested by Gilbert (1987)
n = the number of samples

When a chemical was not detected in a soil sample, the detection limit concentration was conservatively used in calculating the 95% UCL for that chemical.

Equations used to calculate chemical intakes from soil are presented in Table 3-1. Exposure variables used to calculate chemical intakes from soil via ingestion, inhalation, and dermal contact are presented in Tables 3-2 for current and future human receptors.

## 3.3 Exposure Estimates for Individuals Potentially Exposed to the Chemicals of Concern Under Current and Planned Future Land Use Conditions

Estimated chemical intakes resulting from soil exposure for the current on-site maintenance worker, on-site child trespasser, and off-site child resident are presented in Tables 3-3, 3-4, and 3-5 respectively. These intakes were calculated using the 95% UCLs calculated for chemicals in surface soil as presented in Table 2-1.

For future human receptors, chemical intakes resulting from soil exposure are presented in Tables 3-6, 3-7, 3-8, and 3-9 for the on-site maintenance worker, on-site child patron, on-site construction worker, and on-site institutional worker, respectively. These intakes were calculated using the 95% UCLs calculated for chemicals in surface and subsurface soil as presented in Table 2-2.

Estimates of daily chemical intake are expressed as average daily intakes or lifetime average daily intakes. Average daily intakes are calculated over the assumed period of exposure whereas lifetime average daily intakes are calculated over a lifetime (70 years). Average daily intakes are used to calculate noncancer risks and lifetime average daily intakes are used to calculate added lifetime cancer risks resulting from exposure to chemicals in soil.

Average daily intakes and lifetime average daily intakes for ingested and inhaled chemicals of concern are expressed as intakes rather than absorbed doses. Dermal average daily intakes are calculated as absorbed doses.

Daily intakes of lead from soil exposure in milligrams of lead per kilogram of body weight per day were not calculated. The USEPA requires the use of the IEUBK model to assess lead intake and the resulting blood lead concentration associated with exposure to lead in dust, soil, food, drinking water, and air (USEPA, 1994b). The IEUBK model is applicable only to children aged 7 years and younger. There is currently no equivalent model for assessing lead exposure in older children and adults. Risk associated with exposure to lead in soil is addressed in Section 5.

## Table 3-1
## Calculation of Intakes of the Chemicals of Concern in Soil

| Exposure Pathway | Exposure Equation | Exposure variables |
|---|---|---|
| **Air**<br>Inhalation of particulate phase chemicals | Average daily intake =<br>$\frac{CS \times PC \times VR \times EF \times ED \times CF}{BW \times AT}$ | CS = Concentration of chemical in particulate (mg/kg)<br>PC = Particulate concentration in air ($mg/m^3$); for all receptors except the construction worker, PC was set to 0.00036 $mg/m^3$ in accordance with USEPA, 1994a. For the construction worker, PC was assumed to be 0.6 $mg/m^3$ due to soil disturbance.<br>VR = Inhalation rate ($m^3$/day or event)<br>EF = Exposure frequency (days or events/year)<br>ED = Exposure duration (years)<br>CF = Conversion factor ($10^{-6}$ kg/mg)<br>BW = Body weight (kg)<br>AT =Averaging time (period over which exposure is averaged) |
| **Soil**<br>Ingestion of soil | Average daily intake =<br>$\frac{CS \times IR \times FI \times BA \times EF \times ED \times CF}{BW \times AT}$ | CS = Chemical concentration in soil (mg/kg)<br>IR = Ingestion rate (mg soil/day)<br>FI = Fraction ingested from affected source (unitless)<br>BA = Bioavailable fraction in soil (0.6 for arsenic; 1 for other chemicals)<br>EF = Exposure frequency (days/year)<br>ED = Exposure duration (years)<br>CF= Conversion factor ($1 \times 10^{-6}$ kg/mg)<br>BW = Body weight (kg)<br>AT =Averaging time (period over which exposure is averaged) |

**Table 3-1** (continued)

| Exposure Pathway | Exposure Equation | Exposure variables |
|---|---|---|
| Dermal absorption of chemicals in soil | Average daily intake = $\frac{CS \times SA \times AF \times ABS \times EF \times ED \times CF}{BW \times AT}$ | CS = Chemical concentration in soil (mg/kg)<br>SA = Skin surface area available for contact ($cm^2$)<br>AF = Adherence of soil to skin ($mg/cm^2$)<br>ABS = Fraction of chemical absorbed through the skin (unitless); arsenic, 0.001, all organic chemicals- 0.01<br>EF = Exposure frequency (days/year)<br>ED = Exposure Duration (years)<br>CF= Conversion factor ($1 \times 10^{-6}$ kg/mg)<br>BW = Body Weight (kg)<br>AT =Averaging time (period over which exposure is averaged) |

## Table 3-2
## Exposure Assumptions

Key to Assumptions

| | |
|---|---|
| BW | Body weight (kg) |
| IR | Soil ingestion rate (mg/day) |
| FI | Fraction of soil intake from affected source (unitless) |
| VR | Ventilation rate ($m^3$/day) |
| PC | Dust concentration in air (mg/$m^3$) |
| SA | Skin surface area exposed ($cm^2$) |
| AF | Amount of soil adhering to skin (mg/$cm^2$) |
| EF | Days exposed per year (days/year) |
| ED | Number of years exposed (years) |
| $AT_{nc}$ | Averaging time for non-carcinogens (days) |
| $AT_c$ | Averaging time for potential carcinogens (days) |

**Current Exposure Assumptions**

| Exposure Parameter | Maintenance Worker | Child Trespasser | Off-Site Child Resident | References |
|---|---|---|---|---|
| BW | 70 | 40 | 15 | USEPA, 1991 |
| IR | 100 | 100 | NA | USEPA, 1991 |
| FI | 1 | 1 | NA | Judgment |
| VR | 20 | 5 | 11.8 | USEPA, 1991; CARB, 1993; Finley et al., 1994 |
| PC | 0.00036 | 0.00036 | 0.00036 | USEPA, 1994a |
| SA | 5800 | 4000 | NA | USEPA, 1992b |
| AF | 1 | 1 | NA | USEPA, 1992b |
| EF | 50 | 75 | 350 | Judgment |
| ED | 25 | 9 | 6 | USEPA, 1991 |
| $AT_{nc}$ | 9125 | 3285 | 2190 | - |
| $AT_c$ | 25,550 | 25,550 | 25,550 | - |

NA - not applicable; the off-site child resident would not contact affected on-site soils

## Table 3-2 (continued)

Key to Assumptions

| | |
|---|---|
| BW | Body weight (kg) |
| IR | Soil ingestion rate (mg/day) |
| FI | Fraction of soil intake from affected source (unitless) |
| VR | Ventilation rate ($m^3$/day) |
| PC | Dust concentration in air (mg/$m^3$) |
| SA | Skin surface area exposed ($cm^2$) |
| AF | Amount of soil adhering to skin (mg/$cm^2$) |
| EF | Days exposed per year (days/year) |
| ED | Number of years exposed (years) |
| $AT_{nc}$ | Averaging time for non-carcinogens (days) |
| $AT_c$ | Averaging time for potential carcinogens (days) |

**Future Exposure Conditions**

| Exposure Parameter | Maintenance Worker | Child Patron | Construction Worker | Institutional Worker | References |
|---|---|---|---|---|---|
| BW | 70 | 40 | 70 | 70 | USEPA, 1991 |
| IR | 100 | 100 | 480 | 50 | USEPA, 1991 |
| FI | 0.5 | 0.5 | 1 | 0.35 | Judgment |
| VR | 20 | 5 | 20 | 20 | USEPA, 1991; CARB, 1993 |
| PC | 0.00036 | 0.00036 | 0.6 | 0.00036 | GRI, 1988; USEPA, 1994a |
| SA | 5800 | 4000 | 17,550 | 5800 | USEPA, 1992b |
| AF | 1 | 1 | 1 | 0.5 | USEPA, 1992b |
| EF | 50 | 75 | 60 | 250 | Judgment: USEPA, 1991 |
| ED | 25 | 9 | 1 | 25 | Judgment; USEPA, 1991 |
| $AT_{nc}$ | 9125 | 3285 | 365 | 9125 | - |
| $AT_c$ | 25,550 | 25,550 | 25,550 | 25,550 | - |

**Table 3-3**
**Current Maintenance Worker**
**Exposure to Chemicals in Surface Soils**
**Average Daily Intakes**

| Chemical | Average Daily Intake | | | Lifetime Average Daily Intake | | |
|---|---|---|---|---|---|---|
| | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day |
| **Metals** | | | | | | |
| Arsenic | 1.18E-05 | 8.57E-07 | 1.06E-09 | 4.22E-06 | 3.06E-07 | 3.80E-10 |
| Lead | | See Section 5 | | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | nc | nc | nc | 1.85E-08 | 1.07E-08 | na |
| Benzo(a)pyrene | nc | nc | nc | 1.82E-08 | 1.06E-08 | na |
| Benzo(b or k) fluoranthene | nc | nc | nc | 2.45E-08 | 1.42E-08 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 1.86E-09 | 1.08E-09 | 1.34E-13 | 6.63E-10 | 3.84E-10 | 4.77E-14 |
| BHC-alpha | 1.37E-09 | 7.97E-10 | 9.90E-14 | 4.91E-10 | 2.85E-10 | 3.53E-14 |
| BHC-beta | 5.67E-09 | 3.29E-09 | 4.08E-13 | 2.02E-09 | 1.17E-09 | 1.46E-13 |
| BHC-delta | 2.93E-09 | 1.70E-09 | 2.11E-13 | na | na | na |
| BHC-gamma | 1.81E-09 | 1.05E-09 | 1.30E-13 | 6.47E-10 | 3.75E-10 | na |
| Chlordane-alpha | 1.76E-07 | 1.02E-07 | 1.26E-11 | 6.27E-08 | 3.64E-08 | 4.52E-12 |
| Chlordane-gamma | 2.41E-07 | 1.40E-07 | 1.74E-11 | 8.62E-08 | 5.00E-08 | 6.20E-12 |
| DDD | 7.93E-08 | 4.60E-08 | 5.71E-12 | 2.83E-08 | 1.64E-08 | na |
| DDE | 6.66E-07 | 3.86E-07 | 4.80E-11 | 2.38E-07 | 1.38E-07 | na |
| DDT | 8.24E-07 | 4.78E-07 | 5.93E-11 | 2.94E-07 | 1.71E-07 | 2.12E-11 |
| Dieldrin | 9.61E-08 | 5.58E-08 | 6.92E-12 | 3.43E-08 | 1.99E-08 | 2.47E-12 |
| Endosulfan I | 2.53E-09 | 1.47E-09 | 1.82E-13 | na | na | na |
| Endosulfan II | 6.36E-09 | 3.69E-09 | 4.58E-13 | na | na | na |
| Endrin ketone | 7.91E-09 | 4.59E-09 | 5.70E-13 | na | na | na |
| Heptachlor | 3.36E-09 | 1.95E-09 | 2.42E-13 | 1.20E-09 | 6.96E-10 | 8.64E-14 |
| Heptachlor epoxide | 4.05E-08 | 2.35E-08 | 2.92E-12 | 1.45E-08 | 8.39E-09 | 1.04E-12 |
| Methoxychlor | 1.74E-08 | 1.01E-08 | 1.25E-12 | na | na | na |
| PCB 1254 | 2.78E-08 | 1.61E-08 | 2.00E-12 | 9.94E-09 | 5.76E-09 | na |
| Toxaphene | 1.85E-07 | 1.07E-07 | 1.33E-11 | 6.61E-08 | 3.83E-08 | 4.76E-12 |

na - not applicable-chemical is not considered to be a potential carcinogen

**Table 3-4**
**Current Child Trespasser**
**Exposure to Chemicals in Surface Soils**
**Average Daily Intakes**

| Chemical | Average Daily Intake | | | Lifetime Average Daily Intake | | |
|---|---|---|---|---|---|---|
| | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day |
| **Metals** | | | | | | |
| Arsenic | 3.10E-05 | 1.55E-06 | 1.40E-09 | 3.99E-06 | 1.99E-07 | 1.80E-10 |
| Lead | | see Section 5 | | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | nc | nc | nc | 1.74E-08 | 6.97E-09 | na |
| Benzo(a)pyrene | nc | nc | nc | 1.72E-08 | 6.90E-09 | na |
| Benzo(b or k) fluoranthene | nc | nc | nc | 2.31E-08 | 9.25E-09 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 4.87E-09 | 1.95E-09 | 1.75E-13 | 6.26E-10 | 2.51E-10 | 2.25E-14 |
| BHC-alpha | 3.61E-09 | 1.44E-09 | 1.30E-13 | 4.64E-10 | 1.86E-10 | 1.67E-14 |
| BHC-beta | 1.49E-08 | 5.95E-09 | 5.36E-13 | 1.91E-09 | 7.65E-10 | 6.89E-14 |
| BHC-delta | 7.68E-09 | 3.07E-09 | 2.77E-13 | na | na | na |
| BHC-gamma | 4.76E-09 | 1.90E-09 | 1.71E-13 | 6.11E-10 | 2.45E-10 | na |
| Chlordane-alpha | 4.61E-07 | 1.84E-07 | 1.66E-11 | 5.93E-08 | 2.37E-08 | 2.13E-12 |
| Chlordane-gamma | 6.33E-07 | 2.53E-07 | 2.28E-11 | 8.14E-08 | 3.26E-08 | 2.93E-12 |
| DDD | 2.08E-07 | 8.32E-08 | 7.49E-12 | 2.68E-08 | 1.07E-08 | na |
| DDE | 1.75E-06 | 6.99E-07 | 6.29E-11 | 2.25E-07 | 8.99E-08 | na |
| DDT | 2.16E-06 | 8.65E-07 | 7.79E-11 | 2.78E-07 | 1.11E-07 | 1.00E-11 |
| Dieldrin | 2.52E-07 | 1.01E-07 | 9.08E-12 | 3.24E-08 | 1.30E-08 | 1.17E-12 |
| Endosulfan I | 6.65E-09 | 2.66E-09 | 2.39E-13 | na | na | na |
| Endosulfan II | 1.67E-08 | 6.68E-09 | 6.01E-13 | na | na | na |
| Endrin ketone | 2.08E-08 | 8.31E-09 | 7.48E-13 | na | na | na |
| Heptachlor | 8.82E-09 | 3.53E-09 | 3.18E-13 | 1.13E-09 | 4.54E-10 | 4.08E-14 |
| Heptachlor epoxide | 1.06E-07 | 4.25E-08 | 3.83E-12 | 1.37E-08 | 5.47E-09 | 4.92E-13 |
| Methoxychlor | 4.56E-08 | 1.82E-08 | 1.64E-12 | na | na | na |
| PCB 1254 | 7.30E-08 | 2.92E-08 | 2.63E-12 | 9.39E-09 | 3.76E-09 | na |
| Toxaphene | 4.86E-07 | 1.94E-07 | 1.75E-11 | 6.24E-08 | 2.50E-08 | 2.25E-12 |

na - not applicable-chemical is not considered to be a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor

Table 3-5
Current Off-Site Child Resident
Inhalation of Chemicals in Surface Soils
Average Daily Intakes

| Chemical | Average Daily Inhalation mg/kg/day | Lifetime Average Daily Inhalation mg/kg/day |
|---|---|---|
| **Metals** | | |
| Arsenic | 1.22E-08 | 1.04E-09 |
| Lead | See Section 5 | * |
| **Semivolatile organic chemicals** | | |
| Benz(a)anthracene | 4.25E-11 | na |
| Benzo(a)pyrene | 4.20E-11 | na |
| Benzo(b or k) fluoranthene | 5.64E-11 | na |
| **Pesticides/PCBs** | | |
| Aldrin | 1.53E-12 | 1.31E-13 |
| BHC-alpha | 1.13E-12 | 9.70E-14 |
| BHC-beta | 4.67E-12 | 4.00E-13 |
| BHC-delta | 2.41E-12 | na |
| BHC-gamma | 1.49E-12 | na |
| Chlordane-alpha | 1.45E-10 | 1.24E-11 |
| Chlordane-gamma | 1.99E-10 | 1.70E-11 |
| DDD | 6.53E-11 | na |
| DDE | 5.48E-10 | na |
| DDT | 6.78E-10 | 5.81E-11 |
| Dieldrin | 7.91E-11 | 6.78E-12 |
| Endosulfan I | 2.08E-12 | na |
| Endosulfan II | 5.24E-12 | na |
| Endrin ketone | 6.51E-12 | na |
| Heptachlor | 2.77E-12 | 2.37E-13 |
| Heptachlor epoxide | 3.33E-11 | 2.86E-12 |
| Methoxychlor | 1.43E-11 | na |
| PCB 1254 | 2.29E-11 | na |
| Toxaphene | 1.52E-10 | 1.31E-11 |

na - not applicable-chemical is not a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor

Table 3-6
Future Maintenance Worker
Exposure to Chemicals in Surface and Subsurface Soils
Average Daily Intakes

| Chemical | Average Daily Intake | | | Lifetime Average Daily Intake | | |
|---|---|---|---|---|---|---|
| | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day |
| **Metals** | | | | | | |
| Arsenic | 5.76E-06 | 8.35E-07 | 1.04E-09 | 2.06E-06 | 2.98E-07 | 3.70E-10 |
| Lead | See Section 5 | | | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | nc | nc | nc | 8.98E-09 | 1.04E-08 | na |
| Benzo(a)pyrene | nc | nc | nc | 8.88E-09 | 1.03E-08 | na |
| Benzo(b or k) fluoranthene | nc | nc | nc | 1.15E-08 | 1.34E-08 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 9.57E-10 | 1.11E-09 | 1.38E-13 | 3.42E-10 | 3.96E-10 | 4.92E-14 |
| BHC-alpha | 7.37E-10 | 8.54E-10 | 1.06E-13 | 2.63E-10 | 3.05E-10 | 3.79E-14 |
| BHC-beta | 3.04E-09 | 3.52E-09 | 4.37E-13 | 1.08E-09 | 1.26E-09 | 1.56E-13 |
| BHC-delta | 1.41E-09 | 1.63E-09 | 2.03E-13 | na | na | na |
| BHC-gamma | 9.43E-10 | 1.09E-09 | 1.36E-13 | 3.37E-10 | 3.91E-10 | na |
| Chlordane-alpha | 5.77E-08 | 6.70E-08 | 8.31E-12 | 2.06E-08 | 2.39E-08 | 2.97E-12 |
| Chlordane-gamma | 9.46E-08 | 1.10E-07 | 1.36E-11 | 3.38E-08 | 3.92E-08 | 4.87E-12 |
| DDD | 5.68E-09 | 6.58E-09 | 8.17E-13 | 2.03E-09 | 2.35E-09 | na |
| DDE | 3.01E-07 | 3.50E-07 | 4.34E-11 | 1.08E-07 | 1.25E-07 | na |
| DDT | 3.36E-07 | 3.90E-07 | 4.84E-11 | 1.20E-07 | 1.39E-07 | 1.73E-11 |
| Dieldrin | 3.86E-08 | 4.47E-08 | 5.55E-12 | 1.38E-08 | 1.60E-08 | 1.98E-12 |
| Endosulfan I | 1.26E-09 | 1.46E-09 | 1.81E-13 | na | na | na |
| Endosulfan II | 3.02E-09 | 3.50E-09 | 4.35E-13 | na | na | na |
| Endrin ketone | 3.67E-09 | 4.26E-09 | 5.28E-13 | na | na | na |
| Heptachlor | 1.58E-09 | 1.84E-09 | 2.28E-13 | 5.65E-10 | 6.56E-10 | 8.14E-14 |
| Heptachlor epoxide | 1.55E-08 | 1.80E-08 | 2.24E-12 | 5.55E-09 | 6.44E-09 | 8.00E-13 |
| Methoxychlor | 5.19E-09 | 6.02E-09 | 7.47E-13 | na | na | na |
| PCB 1254 | 1.49E-08 | 1.73E-08 | 2.15E-12 | 5.33E-09 | 6.18E-09 | na |
| Toxaphene | 8.76E-08 | 1.02E-07 | 1.26E-11 | 3.13E-08 | 3.63E-08 | 4.51E-12 |

na - not applicable; chemical is not a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor

Table 3-7
Future Child Patron
Exposure to Chemicals in Surface and Subsurface Soils
Average Daily Intakes

| Chemical | Average Daily Intake | | | Lifetime Average Daily Intake | | |
|---|---|---|---|---|---|---|
| | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day |
| **Metals** | | | | | | |
| Arsenic | 1.51E-05 | 1.51E-06 | 1.36E-09 | 1.94E-06 | 1.94E-07 | 1.75E-10 |
| Lead | | See Section 5 | | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | nc | nc | nc | 8.49E-09 | 6.79E-09 | na |
| Benzo(a)pyrene | nc | nc | nc | 8.39E-09 | 6.71E-09 | na |
| Benzo(b or k) fluoranthene | nc | nc | nc | 1.09E-08 | 8.72E-09 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 2.51E-09 | 2.01E-09 | 1.81E-13 | 3.23E-10 | 2.58E-10 | 2.33E-14 |
| BHC-alpha | 1.93E-09 | 1.55E-09 | 1.39E-13 | 2.49E-10 | 1.99E-10 | 1.79E-14 |
| BHC-beta | 7.97E-09 | 6.38E-09 | 5.74E-13 | 1.03E-09 | 8.20E-10 | 7.38E-14 |
| BHC-delta | 3.70E-09 | 2.96E-09 | 2.66E-13 | na | na | na |
| BHC-gamma | 2.48E-09 | 1.98E-09 | 1.78E-13 | 3.18E-10 | 2.55E-10 | na |
| Chlordane-alpha | 1.52E-07 | 1.21E-07 | 1.09E-11 | 1.95E-08 | 1.56E-08 | 1.40E-12 |
| Chlordane-gamma | 2.48E-07 | 1.99E-07 | 1.79E-11 | 3.19E-08 | 2.56E-08 | 2.30E-12 |
| DDD | 1.49E-08 | 1.19E-08 | 1.07E-12 | 1.92E-09 | 1.53E-09 | na |
| DDE | 7.91E-07 | 6.33E-07 | 5.70E-11 | 1.02E-07 | 8.14E-08 | na |
| DDT | 8.82E-07 | 7.06E-07 | 6.35E-11 | 1.13E-07 | 9.07E-08 | 8.16E-12 |
| Dieldrin | 1.01E-07 | 8.10E-08 | 7.29E-12 | 1.30E-08 | 1.04E-08 | 9.37E-13 |
| Endosulfan I | 3.29E-09 | 2.64E-09 | 2.37E-13 | na | na | na |
| Endosulfan II | 7.92E-09 | 6.34E-09 | 5.70E-13 | na | na | na |
| Endrin ketone | 9.63E-09 | 7.71E-09 | 6.94E-13 | na | na | na |
| Heptachlor | 4.15E-09 | 3.32E-09 | 2.99E-13 | 5.34E-10 | 4.27E-10 | 3.85E-14 |
| Heptachlor epoxide | 4.08E-08 | 3.27E-08 | 2.94E-12 | 5.25E-09 | 4.20E-09 | 3.78E-13 |
| Methoxychlor | 1.36E-08 | 1.09E-08 | 9.80E-13 | na | na | na |
| PCB 1254 | 3.92E-08 | 3.13E-08 | 2.82E-12 | 5.04E-09 | 4.03E-09 | na |
| Toxaphene | 2.30E-07 | 1.84E-07 | 1.66E-11 | 2.96E-08 | 2.37E-08 | 2.13E-12 |

na - not applicable; chemical is not potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor

**Table 3-8**
**Future Construction Worker**
**Exposure to Chemicals in Surface and Subsurface Soils**
**Average Daily Intakes**

| Chemical | Average Daily Intake | | | Lifetime Average Daily Intake | | |
|---|---|---|---|---|---|---|
| | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day |
| **Metals** | | | | | | |
| Arsenic | 6.64E-05 | 3.03E-06 | 2.07E-06 | 9.48E-07 | 4.33E-08 | 2.96E-08 |
| Lead | | See Section 5 | | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | nc | nc | nc | 4.14E-09 | 1.51E-09 | na |
| Benzo(a)pyrene | nc | nc | nc | 4.09E-09 | 1.50E-09 | na |
| Benzo(b or k) fluoranthene | nc | nc | nc | 5.31E-09 | 1.94E-09 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 1.10E-08 | 4.03E-09 | 2.76E-10 | 1.58E-10 | 5.76E-11 | 3.94E-12 |
| BHC-alpha | 8.49E-09 | 3.10E-09 | 2.12E-10 | 1.21E-10 | 4.43E-11 | 3.03E-12 |
| BHC-beta | 3.50E-08 | 1.28E-08 | 8.75E-10 | 5.00E-10 | 1.83E-10 | 1.25E-11 |
| BHC-delta | 1.62E-08 | 5.93E-09 | 4.06E-10 | na | na | na |
| BHC-gamma | 1.09E-08 | 3.97E-09 | 2.72E-10 | 1.55E-10 | 5.68E-11 | na |
| Chlordane-alpha | 6.65E-07 | 2.43E-07 | 1.66E-08 | 9.50E-09 | 3.47E-09 | 2.38E-10 |
| Chlordane-gamma | 1.09E-06 | 3.99E-07 | 2.73E-08 | 1.56E-08 | 5.69E-09 | 3.89E-10 |
| DDD | 6.54E-08 | 2.39E-08 | 1.63E-09 | 9.34E-10 | 3.41E-10 | na |
| DDE | 3.47E-06 | 1.27E-06 | 8.68E-08 | 4.96E-08 | 1.81E-08 | na |
| DDT | 3.87E-06 | 1.42E-06 | 9.68E-08 | 5.53E-08 | 2.02E-08 | 1.38E-09 |
| Dieldrin | 4.44E-07 | 1.62E-07 | 1.11E-08 | 6.35E-09 | 2.32E-09 | 1.59E-10 |
| Endosulfan I | 1.45E-08 | 5.29E-09 | 3.61E-10 | na | na | na |
| Endosulfan II | 3.48E-08 | 1.27E-08 | 8.69E-10 | na | na | na |
| Endrin ketone | 4.23E-08 | 1.55E-08 | 1.06E-09 | na | na | na |
| Heptachlor | 1.82E-08 | 6.67E-09 | 4.56E-10 | 2.60E-10 | 9.52E-11 | 6.51E-12 |
| Heptachlor epoxide | 1.79E-07 | 6.55E-08 | 4.48E-09 | 2.56E-09 | 9.36E-10 | 6.40E-11 |
| Methoxychlor | 5.97E-08 | 2.18E-08 | 1.49E-09 | na | na | na |
| PCB 1254 | 1.72E-07 | 6.29E-08 | 4.30E-09 | 2.46E-09 | 8.98E-10 | na |
| Toxaphene | 1.01E-06 | 3.69E-07 | 2.52E-08 | 1.44E-08 | 5.27E-09 | 3.60E-10 |

na - not applicable; chemical is not a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor

**Table 3-9**
**Future Institutional Worker**
**Exposure to Chemicals in Surface and Subsurface Soils**
**Average Daily Intakes**

| Chemical | Average Daily Intake | | | Lifetime Average Daily Intake | | |
|---|---|---|---|---|---|---|
| | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day | Ingestion mg/kg/day | Dermal mg/kg/day | Inhalation mg/kg/day |
| **Metals** | | | | | | |
| Arsenic | 1.01E-05 | 2.09E-06 | 5.19E-09 | 3.60E-06 | 7.46E-07 | 1.85E-09 |
| Lead | | See Section 5 | | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | nc | nc | nc | 1.57E-08 | 2.60E-08 | na |
| Benzo(a)pyrene | nc | nc | nc | 1.55E-08 | 2.57E-08 | na |
| Benzo(b or k) fluoranthene | nc | nc | nc | 2.02E-08 | 3.34E-08 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 1.67E-09 | 2.78E-09 | 6.89E-13 | 5.98E-10 | 9.91E-10 | 2.46E-13 |
| BHC-alpha | 1.29E-09 | 2.14E-09 | 5.30E-13 | 4.60E-10 | 7.63E-10 | 1.89E-13 |
| BHC-beta | 5.32E-09 | 8.81E-09 | 2.19E-12 | 1.90E-09 | 3.15E-09 | 7.81E-13 |
| BHC-delta | 2.46E-09 | 4.08E-09 | 1.01E-12 | na | na | na |
| BHC-gamma | 1.65E-09 | 2.74E-09 | 6.79E-13 | 5.89E-10 | 9.77E-10 | na |
| Chlordane-alpha | 1.01E-07 | 1.67E-07 | 4.16E-11 | 3.61E-08 | 5.98E-08 | 1.48E-11 |
| Chlordane-gamma | 1.66E-07 | 2.74E-07 | 6.81E-11 | 5.91E-08 | 9.80E-08 | 2.43E-11 |
| DDD | 9.93E-09 | 1.65E-08 | 4.09E-12 | 3.55E-09 | 5.88E-09 | na |
| DDE | 5.27E-07 | 8.74E-07 | 2.17E-10 | 1.88E-07 | 3.12E-07 | na |
| DDT | 5.88E-07 | 9.74E-07 | 2.42E-10 | 2.10E-07 | 3.48E-07 | 8.64E-11 |
| Dieldrin | 6.75E-08 | 1.12E-07 | 2.78E-11 | 2.41E-08 | 3.99E-08 | 9.92E-12 |
| Endosulfan I | 2.20E-09 | 3.64E-09 | 9.04E-13 | na | na | na |
| Endosulfan II | 5.28E-09 | 8.75E-09 | 2.17E-12 | na | na | na |
| Endrin ketone | 6.42E-09 | 1.06E-08 | 2.64E-12 | na | na | na |
| Heptachlor | 2.77E-09 | 4.59E-09 | 1.14E-12 | 9.89E-10 | 1.64E-09 | 4.07E-13 |
| Heptachlor epoxide | 2.72E-08 | 4.51E-08 | 1.12E-11 | 9.72E-09 | 1.61E-08 | 4.00E-12 |
| Methoxychlor | 9.08E-09 | 1.50E-08 | 3.73E-12 | na | na | na |
| PCB 1254 | 2.61E-08 | 4.33E-08 | 1.07E-11 | 9.33E-09 | 1.55E-08 | na |
| Toxaphene | 1.53E-07 | 2.54E-07 | 6.31E-11 | 5.47E-08 | 9.07E-08 | 2.25E-11 |

na - not applicable; chemical is not a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor

# 4.0 TOXICITY ASSESSMENT

## 4.1 Noncarcinogenic Risks

The noncarcinogenic effects of the chemicals of concern were assessed by comparing chemical intakes calculated in Section 3.3 with USEPA reference doses (RfDs). The USEPA definition of the RfD is presented below.

> "The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of the daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a portion of the lifetime, in the case of a subchronic RfD, or during a lifetime, in the case of a chronic RfD." (USEPA, 1989b)

The USEPA derives RfDs for inhalation and oral exposure for subchronic exposures (2 weeks to 7 years) and chronic exposures (7 years and longer) for many chemicals. Inhalation and oral reference doses for the chemicals of concern are presented in Tables 4-1 and 4-2. Chronic RfDs were used to assess inhalation risks to the off-site child resident, future maintenance worker, future library personnel, and future library patrons. Subchronic RfDs were used to assess noncancer risks to construction workers. For instances where only a chronic reference dose exists, the chronic reference dose was also used as the subchronic reference dose.

The RfDs used in this assessment are generally derived from animal studies. The results of these studies are extrapolated to humans using appropriate factors to adjust for uncertainties resulting from:

- Extrapolation from the results of animal studies to humans,
- Extrapolation from the results of short-term animal studies,
- Extrapolation from exposure levels in animal studies that demonstrate an effect rather than a no-effect level and,
- Variation within individuals of the same species.

For any particular chemical, an intake that exceeds the RfD for that chemical indicates that an adverse health effect may occur. The intake/RfD is defined by the USEPA to be the hazard quotient (HQ) for a chemical. As a general rule, when the HQ < 1, it is unlikely that an adverse health effect will occur. The chance of observing an effect increases as the HQ increasingly exceeds unity. The USEPA directs that the HQ for each chemical and each route of

exposure be summed to calculate a hazard index (HI). This process conservatively assumes that simultaneous exposure to multiple chemicals at intakes below the RfD may produce an adverse health effect if the HI exceeds one. When calculated according to USEPA methods, the HI assumes that the effects of each chemical are additive. The HI is used as a screen to determine whether or not the effects of intake of multiple chemicals may be of concern. If the HI is less than one, there is little reason to expect that any adverse effect will result from concurrent exposure to all of the chemicals of concern.

The USEPA does not derive dermal RfDs for chemicals. However, since dermal exposure may add to the overall intake of a chemical and possibly cause an adverse effect, the oral RfD is used to calculate a dermal RfD (when an oral RfD is available). The USEPA requires that when gastrointestinal absorption of a chemical is low, the oral RfD must be corrected for absorption before it is used to assess health effects possibly associated with dermal absorption of that chemical. Dermal RfDs were derived from oral RfDs according to the method described in the Final Baseline Risk Assessment for the Woolfolk Chemical Works Site (IC, 1992).

## 4.2 Carcinogenic Risks

The chemicals of concern that are considered by the USEPA to be potentially carcinogenic in humans are presented in Tables 4-1 and 4-2. With the exception of arsenic, the potential carcinogenicity of the other chemicals of concern has been extrapolated from animal studies. This is reflected in the "B" USEPA Group classification of these chemicals.

Slope factors for the potentially carcinogenic chemicals of concern were determined by the USEPA by applying the linearized multistage model to data from animal carcinogenicity studies or human epidemiological studies. In the absence of data concerning the carcinogenic potential of very low doses of a chemical, linearized multistage modeling is used to generate estimates of carcinogenic potency. Inherent in the linearized multistage model is the provision that there is no dose, no matter how small, that is not associated with some carcinogenic risk. The USEPA defaults to this conservative position in the absence of firm scientific data to support the application of the linearized multistage model. The uncertainties associated with weight-of-evidence classifications and use of the linearized multistage model are addressed in a later section of this report. Multiplication of the lifetime average daily intake by the slope factor [in $(mg/kg/day)^{-1}$] produces a unitless estimate of lifetime cancer risk. Increased lifetime cancer risk calculated by this method is often expressed in terms of 1 in ten thousand (1E-04), 1 in one hundred thousand (1E-05), or 1 in one million (1E-06). As with the calculation of the hazard index, added lifetime cancer risks are summed across pathways of potential exposure. As directed by the USEPA (USEPA, 1989a), the lifetime

cancer risks resulting from exposure to chemicals in soil are assumed to be additive.

### 4.3 Toxicological Effects of Lead

Unlike other chemicals for which human exposure is calculated in terms of chemical intake (intake in milligrams of chemical per kilogram of body weight per day, mg/kg/day), risks associated with exposure to lead are based on blood lead concentrations. Due to the existence of an ever-growing database relating blood lead concentration (typically expressed in terms of micrograms of lead per deciliter of blood, µg/dL) and human toxicity, blood lead concentration is the most direct means by which the toxic effects of lead in humans can be assessed.

The USEPA and others have developed lead exposure models for evaluating blood lead concentrations associated with intake of lead from food, water, air, and soil. The USEPA lead model (integrated exposure uptake biokinetic model) is calibrated for use only for children ages 7 and younger (USEPA, 1994b). The USEPA IEUBK is used for calculating blood lead concentrations for the off-site child resident exposed to lead in OU-2 surface soils.

Table 4-1
Inhalation Reference Doses and Slope Factors for Chemicals of Concern

| Chemical | Reference Doses | | | | | Slope Factors | | |
|---|---|---|---|---|---|---|---|---|
| | Non-carcinogenic effects | RfC (RfD)[a] Subchronic (mg/kg/day) | Safety Factor | RfC (RfD)[a] Chronic (mg/kg/day) | Safety Factor | Carcinogenic Effects | Slope Factor $(mg/kg/day)^{-1}$ | EPA Group |
| **Metals** | | | | | | | | |
| Arsenic | - | - | - | - | - | Lung cancer | 1.50E+01 | A |
| Lead | - | - | - | - | - | Kidney tumors | - | B2 |
| **Pesticides and PCBs** | | | | | | | | |
| Aldrin | - | - | - | - | - | Liver carcinoma | 1.70E+01 | B2 |
| BHC-gamma | - | - | - | - | - | - | - | - |
| BHC-alpha | - | - | - | - | - | Liver tumors | 6.30E+00 | B2 |
| BHC-beta | - | - | - | - | - | Liver tumors | 1.80E+00 | C |
| BHC-delta | - | - | - | - | - | - | - | - |
| Chlordane-alpha | - | - | - | - | - | Liver carcinoma | 1.30E+00 | - |
| Chlordane-gamma | - | - | - | - | - | Liver carcinoma | 1.30E+00 | - |
| DDD | - | - | - | - | - | - | - | - |
| DDE | - | - | - | - | - | - | - | - |
| DDT | - | - | - | - | - | Liver tumors | 3.40E-01 | - |
| Dieldrin | - | - | - | - | - | Liver carcinoma | 1.60E+01 | B2 |

Table 4-1 (continued)

| Chemical | Reference Doses | | | | | Slope Factors | | |
|---|---|---|---|---|---|---|---|---|
| | Non-carcinogenic effects | RfC (RfD)[a] Subchronic (mg/kg/day) | Safety Factor | RfC (RfD)[a] Chronic (mg/kg/day) | Safety Factor | Carcinogenic Effects | Slope Factor $(mg/kg/day)^{-1}$ | EPA Group |
| Endosulfan I | - | - | - | - | - | - | - | - |
| Endosulfan II | - | - | - | - | - | - | - | - |
| Endrin ketone | - | - | - | - | - | - | - | - |
| Heptachlor | - | - | - | - | - | Liver carcinoma | 4.50E+00 | B2 |
| Heptachlor epoxide | - | - | - | - | - | Liver carcinoma | 9.10E+00 | B2 |
| Methoxychlor | - | - | - | - | - | - | - | - |
| PCB-1254 | - | - | - | - | - | - | - | B2 |
| Toxaphene | - | - | - | - | - | Liver tumors | 1.12E+00 | B2 |

Adapted from US EPA Health Effects Assessment Summary Tables (1994) and IRIS (1/95)

[a] RfD in parenthesis calculated from RfC ($mg/m^3$) using the formula: $RfC \times \frac{20\ m^3/day}{70\ kg} = RfD\ (mg/kg/day)$

[b] Converted to mg/kg/day from inhalation unit risk ($mg/m^3$) using the formula: $\text{Unit risk} \times \frac{70\ kg}{20\ m^3/day} \times \frac{1000\ \mu g}{1\ gm} = \text{Slope factor}$

- = USEPA has not derived an RfD or Slope Factor

USEPA Weight of Evidence Classification for Carcinogens

A. Human carcinogen (sufficient evidence of carcinogenicity in humans)
B. Probable human carcinogen (B1-limited evidence of carcinogenicity in humans; B2-sufficient evidence of carcinogenicity in animals with inadequate evidence in humans)
C. Possible human carcinogen (limited evidence of carcinogenicity in animals, in the absence of human data)
D. Not classifiable as to human carcinogenicity (inadequate or no evidence)
E. Evidence of noncarcinogenicity for humans (no evidence of carcinogenicity in animal studies)

Table 4-2
Oral Reference Doses and Slope Factors for Chemicals of Concern

| Chemical | Reference Doses | | | | | Slope Factors | | |
|---|---|---|---|---|---|---|---|---|
| | Non-carcinogenic effects | RfD Subchronic (mg/kg/day) | Safety Factor | RfD Chronic (mg/kg/day) | Safety Factor | Carcinogenic Effects | Slope Factor $(mg/kg/day)^{-1}$ | EPA Group |
| **Metals** | | | | | | | | |
| Arsenic | Keratosis, hyperpigmentation | 3.00E-04 | 3 | 3.00E-04 | 3 | Skin cancer | 1.50E+00 | A |
| Lead | - | - | - | - | - | Kidney tumors | - | B2 |
| **Pesticides and PCBs** | | | | | | | | |
| Aldrin | Liver lesions | 3.00E-05 | 1000 | 3.00E-05 | 1000 | - | 1.70E+01 | B2 |
| BHC-gamma | Liver and kidney toxicity | 3.00E-03 | 100 | 3.00E-04 | 1000 | Liver tumors | 1.30E+00 | C |
| BHC-alpha | - | - | - | - | - | - | 6.30E+00 | B2 |
| BHC-beta | - | - | - | - | - | - | 1.80E+00 | C |
| BHC-delta | - | - | - | - | - | - | | |
| Chlordane-alpha | - | - | - | - | - | - | - | - |
| Chlordane-gamma | - | - | - | - | - | - | - | - |
| DDD | - | - | - | - | - | - | 2.40E-01 | B2 |
| DDE | - | - | - | - | - | - | 3.40E-01 | B2 |
| DDT | Liver lesions | 5.00E-04 | 100 | 5.00E-04 | 100 | - | 3.40E-01 | B2 |
| Dieldrin | Liver lesions | 5.00E-05 | 100 | 5.00E-05 | 100 | - | 1.60E+01 | B2 |

Table 4-2 (continued)

| Chemical | Reference Doses | | | | | Slope Factors | | |
|---|---|---|---|---|---|---|---|---|
| | Non-carcinogenic effects | RfD Subchronic (mg/kg/day) | Safety Factor | RfD Chronic (mg/kg/day) | Safety Factor | Carcinogenic Effects | Slope Factor $(mg/kg/day)^{-1}$ | EPA Group |
| Endosulfan I | Decreased weight gain, kidney toxicity, aneurysms | 6.00E-03 | 100 | 6.00E-03 | 100 | - | - | - |
| Endosulfan II | Decreased weight gain, kidney toxicity, aneurysms | 6.00E-03 | 100 | 6.00E-03 | 100 | - | - | - |
| Endrin ketone | Convulsions, liver lesions | - | - | - | - | - | - | - |
| Heptachlor | Increased liver weight | 5.00E-04 | 300 | 5.00E-04 | 300 | - | 4.50E+00 | B2 |
| Heptachlor epoxide | Increased relative liver weight | 1.30E-05 | 1000 | 1.30E-05 | 1000 | - | 9.10E+00 | B2 |
| Methoxychlor | Reproductive effects | 5.00E-03 | 1000 | 5.00E-03 | 1000 | - | - | - |
| PCB-1254 | Immune system toxicity | 5.00E-05 | 100 | 2.00E-05 | 300 | - | 7.70E+00 | B2 |
| Toxaphene | - | - | - | - | - | - | 1.10E+00 | B2 |

Adapted from US EPA Health Effects Assessment Summary Tables (1994) and IRIS (5/95)
- = USEPA has not derived an RfD or Slope Factor
[a] Adapted from US EPA Health Effects Assessment Summary Tables (1994)

USEPA Weight of Evidence Classification for Carcinogens
A. Human carcinogen (sufficient evidence of carcinogenicity in humans)
B. Probable human carcinogen (B1-limited evidence of carcinogenicity in humans; B2-sufficient evidence of carcinogenicity in animals with inadequate evidence in humans)
C. Possible human carcinogen (limited evidence of carcinogenicity in animals, in the absence of human data)
D. Not classifiable as to human carcinogenicity (inadequate or no evidence)
E. Evidence of noncarcinogenicity for humans (no evidence of carcinogenicity in animal studies)

## 5.0 RISK CHARACTERIZATION

Hazard quotients and lifetime cancer risks calculated for human receptors exposed to the chemicals of concern in OU-2 soils are discussed below in Sections 5.1 and 5.2, respectively.

### 5.1 Risk Characterization for Current OU-2 Conditions

Under current exposure conditions, a maintenance worker, child trespasser, and off-site child resident were assumed to be exposed to the chemicals of concern in OU-2 surface soils. Risks to these populations are discussed below.

Hazard quotients and lifetime cancer risks calculated for the current maintenance worker are presented in Table 5-1. The total hazard index (sum of all hazard quotients for the ingestion and dermal exposure pathways) was 0.068. This value is less than 1, indicating that a maintenance worker would be unlikely to experience noncarcinogenic health effects as a result of exposure to the chemicals of concern in OU-2 surface soils. About 63% of the total hazard index is attributable to arsenic.

Added lifetime cancer risk for the current maintenance worker exposed to surface soils in OU-2 was calculated to be 9E-06. Nearly all of the calculated lifetime cancer risk was calculated to be associated with exposure to arsenic and dieldrin in OU-2 surface soils. This level of risk is within the range of added lifetime cancer risk accepted by the USEPA (i.e., 1E-06 to 1E-04).

Hazard quotients and lifetime cancer risks for the current child trespasser and current off-site child resident are presented in Tables 5-2 and 5-3, respectively. The chronic total hazard index calculated for the child trespasser was 0.17, indicating that exposure to the chemicals of concern in surface soil would be unlikely to cause noncarcinogenic adverse health effects. No hazard index could be calculated for the off-site child resident due to lack of inhalation reference doses for the chemicals of concern. Overall lifetime cancer risks calculated for the current child trespasser and current off-site child resident were 8E-06 (Table 5-2) and 2E-08 (Table 5-3), respectively. These risks are within the range of added lifetime cancer risks accepted by the USEPA.

#### 5.1.1 Lead Risk Characterization

As stated in Section 3.3 of this report, the USEPA integrated exposure uptake biokinetic (IEUBK) model for lead is used to assess blood lead increases that may be associated with exposure to lead in air, drinking water, food, and soil and dust. The IEUBK 0.99D lead model is applicable only to children aged 7 years and younger.

As discussed in Section 3.1.1 of this report, the current off-site child resident is considered to be exposed to chemicals in OU-2 soils only by the inhalation route of exposure. However, for the output of the IEUBK model to be meaningful, it is reasonable to consider lead exposure from all sources. For this reason, the IEUBK lead exposure model was used to assess exposure to the lead in air, soil and dust, food, and drinking water. With the exception of the soil lead concentration, IEUBK default exposure parameters were used to calculate the blood lead concentration. The assumed soil lead concentration (193 mg/kg) is the arithmetic mean concentration of lead in on-site OU-2 surface soils. In addition, the "multiple source analysis" option was selected to calculate the indoor dust lead concentration (the default is 0.7 times the outdoor soil lead concentration). Because an on-site soil lead concentration is used to assess blood lead concentrations in the exposed off-site child resident, the calculations can be considered particularly conservative. The results of the IEUBK modeling are attached in Appendix A.

The results of the IEUBK model calculations are presented in the table below.

**Blood Lead Concentrations Associated with Current Off-Site Exposure to 193 mg/kg Lead in Soil**

| Age Group (years) | Blood Lead Level (µg/dl) | Total Lead Uptake (µg/day) |
|---|---|---|
| 0.5-1 | 3.7 | 6.88 |
| 1-2 | 4.1 | 9.80 |
| 2-3 | 3.8 | 10.28 |
| 3-4 | 3.6 | 10.31 |
| 4-5 | 3.1 | 8.75 |
| 5-6 | 2.7 | 8.57 |
| 6-7 | 2.5 | 8.69 |

Considering the above IEUBK model calculations, a 1-2 year old child would experience the highest blood lead concentration from exposure to lead in soil. The CDC blood lead level of concern for children is 10 µg/dl (CDC, 1991). The probability that a 1-2 year old child's blood lead concentration would exceed 10 µg/dl was graphed and is attached in Appendix A. According to the graph of probability calculations, the risk of exceeding the CDC blood lead level of concern (10 µg/dl) is 2.7%. This is below the 5% risk typically targeted by the USEPA, indicating that a soil lead concentration of 193 mg/kg is unlikely to result in a blood lead concentration in excess of 10 µg/dl for the current child resident.

## 5.2 Risk Characterization for Future OU-2 Conditions

Under future exposure conditions, a maintenance worker, a child patron of

the library, a cons [illegible] ıstitutional worker were assumed to be exposed to t [illegible] OU-2 surface and subsurface soils. Risks to these po [illegible] ıelow. Differences in exposure to chemicals in soil [illegible] e exposure conditions primarily relate to the future paving of much of the OU-2 property.

Under current exposure conditions, fencing also limits direct human contact with soil. This fencing is assumed to be absent under future conditions.

Hazard quotients and lifetime cancer risks calculated for the future maintenance worker are presented in Table 5-4. The total hazard index (sum of all hazard quotients for the ingestion and dermal exposure pathways) was 0.036. This value is less than 1, indicating that a maintenance worker would be unlikely to experience noncarcinogenic health effects as a result of exposure to the chemicals of concern in OU-2 surface and subsurface soils.

Added lifetime cancer risk for the future maintenance worker exposed to surface and subsurface soils in OU-2 was calculated to be 5E-06. The calculated risk for the future maintenance worker is lower than the current maintenance worker (Table 5-1) largely as a result of the effect of paving areas of OU-2 for a parking lot for the proposed library. As noted above, this level of risk is within the range of added lifetime cancer risk considered acceptable by the USEPA (i.e., 1E-06 to 1E-04).

Total hazard indices for the future child patron (Table 5-5), future construction worker (Table 5-6), and future institutional worker (Table 5-7) were 0.086, 0.33, and 0.072, respectively. These values are less than 1, indicating that future exposure to surface and subsurface soils is unlikely to result in noncarcinogenic health effects for these potential receptors.

In addition, lifetime cancer risks calculated for the future child patron, future construction worker, and future institutional worker were calculated to be 4E-06, 2E-06, and 1E-05, respectively. These lifetime cancer risks are within the range of added lifetime cancer risks considered acceptable by the USEPA.

## 5.3 Evaluation of Risk Assessment Uncertainties

Several areas of uncertainty were associated with the estimation of chemical intakes from exposure to soil and air and the characterization of risk. For ease of discussion, uncertainties are discussed as they relate to either the estimation of exposure or the evaluation of chemical toxicity.

### 5.3.1 Uncertainties Related to Estimation of Exposure

Uncertainties associated with estimation of exposure to the chemicals of concern in soil primarily relate to:

- the selected frequencies of human contact with chemicals in soil and;
- the selection of exposure variables to estimate oral, dermal, and inhalation intakes of the chemicals of concern in soil;

These areas of uncertainty are discussed below.

Determining the frequency of contact with chemicals in OU-2 soils is clearly dependent on site-specific factors, several of which remain uncertain. These factors include how long the OU-2 area will remain in its current state, the degree to which regular maintenance of the property will be required, the type of landscaping to be used at the library, and others.

The current and future maintenance workers were assumed to be exposed to the OU-2 soils 50 days per year for 25 years. This assumption is compatible with a once weekly visit to the site over 50 working weeks per year or two weekly visits per week over the warmest months of the year. These assumptions are unlikely to underestimate exposure, particularly since individuals providing these services have comparatively short periods of tenure with their employer. For example, the US Department of Labor reports that laborers not employed in a construction have a median tenure with their current employer of 3.3 years (US Department of Labor, 1993). Thus, it is relatively unlikely that an individual would remain to provide site maintenance for the OU-2 properties for 25 years.

It was also assumed that a child would trespass on OU-2 75 days per year for 9 years. From the results of a recent study by Silvers et al. (1994), the assumption of 75 days of exposure to chemicals in soil can be considered conservative. Silvers et al. surveyed 1000 households in six states to determine the activity patterns of children between the ages of 5 to 12 years. A total of 182 households was surveyed in California. The time children participated in various activities (sleeping, attending school, eating meals, etc.) was recorded. In addition, the amount of time spent in outdoor and indoor play at home and away from home was also recorded. From their study, Silvers et al. concluded the following:

> "Children between 5 and 12 years of age spend much more time indoors than outdoors. The average time spent indoors by children in New York, New Jersey, Pennsylvania, Washington, and Oregon during Fall and Winter is almost 22.8 h per day. The children in California are not far behind, at about 22.7 h per day spent inside. The California Air Resources Board obtained nearly identical results for California children: 22.0 h inside. Children also spend a great deal of time at home. These results alone have great import for exposure and risk assessments of children; they indicate that attention should be focused on indoor, on-site hazards."

Thus, the estimated frequency of exposure to soils in OU-2 is likely to overestimate soil exposure that a child may experience.

A construction worker was assumed to have contact with OU-2 for 60 days (12 work weeks) during construction of the new library. Many construction jobs are specialized, and construction workers most likely to experience the high level of contact with soil assumed in this report (such as laborers) would be limited to the excavation phase of the project. For example, to excavate the footprint of the new library (2154 square yards) to a depth of one yard would require approximately 20 days using a three-person crew with a hydraulic backhoe with a 1 cubic yard scoop (Means, 1995). Thus, 60 days is a reasonably conservative value for the assumed number of days that a construction worker would spend in contact with OU-2 soils.

In addition to the frequencies and duration of exposure assumed to occur at the OU-2 site, the degree of exposure to soils is also somewhat uncertain. Estimates of exposure to these soils depend on the assumed amount of air inhaled, the amount of soil ingested, the amount of skin surface soiled, the amount of soil adhering to the skin, and the amount of a chemical absorbed through the skin from soil.

In keeping with the USEPA default assumption, construction workers were assumed to ingest 480 mg of soil per day. A review of the USEPA source for this assumption leads to the speculation of Hawley (1985). Hawley calculated that with an <u>assumed</u> soil adherence of 3.5 $mg/cm^2$ to the surface of the hands, an adult would ingest (presumably by licking or mouthing) half of the soil present on the inside of the surfaces of the thumb and fingers of both hands twice daily. However, it is noteworthy that if the EPA recommended upper bound soil adherence value is used (1 $mg/cm^2$; as cited in USEPA, 1992b) is substituted into Hawley's equation, a soil ingestion rate of 137 mg/day is calculated. Thus, the 480 mg/day soil ingestion rate that the USEPA states "may be used" is unsupported by any empirical observation or study and is likely to overestimate soil ingestion in a construction worker.

An additional uncertainty is the degree to which individuals would be exposed to OU-2 soils following construction of the community library along Martin Luther King Drive. For example, the USEPA provides for the use of the "FI" (fraction of soil ingested from affected soils) term to account for site-specific circumstances that could diminish site soil ingestion. Clearly, paving much of the future library property (according to the proposed plan, about 85% of the library site will be covered by the library itself or will be paved) will reduce possible contact with soils. A 0.5 factor for reducing the fraction of soil intake from OU-2 soils is a reasonably conservative assumption under such circumstances.

The amount of soil ingested from OU-2 soils was reduced to 0.35 (0.5 x 0.7 =

0.35) for the future institutional worker to account for the effect of pavement in reducing the amount of affected soil surface (0.5) and to account for the amount of indoor dust that will be composed of outdoor soil (0.7).

Uncertainties associated with dermal exposure estimates for chemicals in soil are primarily associated with the lack of chemical-specific data concerning the rate or amount of chemical that is absorbed through the skin. The fractions of dermal absorption of chemicals from soil were 0.001 for arsenic and 0.01 for pesticides.

In addition, the amount of soil adhering to the skin is an important but somewhat uncertain factor in estimating the amount of a chemical that will be absorbed through the skin. This report uses the USEPA recommended upper bound value of 1 mg/ $cm^2$ as a soil adherence value for all receptors except the institutional worker. It should be noted that these values are derived from studies that examined the adherence of soil to the hands and for this reason, the selected soil adherence values probably overestimate adherence of soil to skin for other areas of the body. For example, EPA states that:

> "However, these studies [Que Hee et al. (1989) and Driver et al. (1989)] were conducted under laboratory conditions and examined adherence to hands only after intimate contact with soil. Such contact may not be representative of normal behavior. Parts of the body that have less intimate contact with the soil will likely have lower values." [Emphasis added]

and

> "Thus, the lower end of this range (0.2) may be the best value to represent an average over all exposed skin and 1 mg may be a reasonable upper value."
> (pages 8-16 and 8-17, USEPA, 1992b)

Considering this information, the assumption of a 1 mg/$cm^2$ soil-to-skin adherence value for the current trespasser, current and future maintenance worker, child patron, and construction worker will likely overestimate the amount of soil adherence to the overall exposed skin surface area of these receptors.

The institutional worker was assumed to have a 0.5 mg/$cm^2$ soil adherence to the skin. This value is reasonable, given that the institutional worker will work indoors. Further, the 0.5 mg/$cm^2$ soil adherence value is similar to the results of Driver et al. (1989). Driver observed that unsieved soils adhered to the hands of an individual that directly pressed the hands into soil at a density of 0.58 mg/$cm^2$. It is further noteworthy that the hands comprise only about 5% to 6% (1000 to 1200 $cm^2$) of the body surface. Clearly, other exposed parts of an institutional worker's body would contact less soil or dust,

indicating th 5 mg/cm$^2$ value for one-quarter of the overall body approximation of the amount of soil that adheres orker.

The amount of skin surface area assumed to be exposed is compatible primarily with warm weather exposure in each assumed case. In particular, per the USEPA recommended parameter, the future construction worker is assumed to have the head, arms, hands, trunk, and legs exposed to soil. This type of exposure would likely overestimate construction worker exposure for all except the hottest months of the year.

Chemicals of concern with low or no appreciable volatility (pesticides, PCBs, and arsenic) were assessed by assuming that the dust concentration in air was 0.00036 mg/m$^3$ for all receptors except the construction worker. The 0.00036 mg/m$^3$ level is the same value recommended for use by the USEPA for the Atlanta area (USEPA, 1994a). The USEPA calculated this dust concentration with the Cowherd fugitive dust emission model and the assumptions that a typical site is 30 acres and 50% vegetated.

The 0.6 mg/m$^3$ dust concentration assumed for the construction worker is intended to account for increased dust concentrations associated with excavation of soil. These values are reasonably conservative given previous observations of dust concentrations around construction areas. For example, dust concentrations measured in a general construction area ranged from 0.094 mg/m$^3$ to 0.593 mg/ m$^3$ with a median concentration of 0.280 mg/ m$^3$ (Cowherd et al., 1974). Thus, a 0.6 mg/m$^3$ airborne dust concentration is likely to represent the upper bound of conditions likely to exist at a construction site.

Additionally, all dust particles present in air were assumed to be respirable and that all dust in air is composed of site soil. It was also assumed that the wind blows in the direction of the receptors 100% of the time. These assumptions would also tend to result in overestimation of chemical exposure from inhalation of particulates.

Given the above discussion, it is unlikely that current or future exposure to the chemicals of concern in OU-2 soils will be underestimated using the exposure parameters presented in Table 3-2.

### 5.3.2 Uncertainties Related to Estimation of Risk

Uncertainties associated with characterization of risks associated with the chemicals of concern primarily relate to the characterization of carcinogenic risk.

Perhaps the greatest uncertainty associated with the risk assessment process is the evaluation of carcinogenic risk due to chemical exposure. The fundamental principles underlying risk assessment for carcinogenic chemicals remain arguable, including the tenet that every potential carcinogen is associated with some degree of carcinogenic risk, no matter how small the dose. The belief that chemically induced cancer is a non-threshold process is a conservative default policy that the EPA assumes to ensure the protection of human health. However, there is little biological basis to support the widespread application of this policy to all potential carcinogens.

The EPA default policy for potential chemical carcinogens mandates that results from high-dose animal studies be extrapolated to exposures in humans that are thousands of times lower. The EPA uses a mathematical model known as the linearized multistage model to extrapolate from high doses to very low doses. As applied by the EPA, the linearized multistage model leads to quantitative estimates of cancer risk that are conservative, upper bound approximations of lifetime cancer risk. The EPA expressed the following uncertainty in using the linearized multistage model to determine carcinogenic risks in humans:

> *"It should be emphasized that the linearized multistage procedure leads to a plausible upper limit to the risk that is consistent with some proposed mechanisms of carcinogenesis. Such an estimate, however, does not necessarily give a realistic prediction of the risk. The true value of risk is unknown, and may be as low as zero. The range of risks, defined by the upper limit given by the chosen model and the lower limit which may be stated as low as zero, should be explicitly stated." (51 Federal Register 33998)*

Thus, according to the EPA commentary cited above, carcinogenic risks estimated using the linearized multistage procedure lead to conservative but not necessarily realistic estimates of risk. The National Research Council has also commented concerning use of the linearized multistage model, stating:

> *"The linearized multistage model is widely used to estimate cancer risks associated with environmental exposures (EPA, 1987) and is said to provide an upper-limit estimate of low-dose response. To some degree, the model's wide use reflects its mathematical flexibility.* ***However, biologic support for the assumption of linearity at low doses remains largely inferential and probably wrong in a high proportion of cases*** *(emphasis added) (Bailar et al., 1988). (NRC, 1989)*

For these reasons, it is likely that the risks calculated in this report will substantially overestimate the actual risks which may be associated with exposure to the chemicals of concern in soil.

Table 5-1

Current Maintenance Worker

Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface Soils

| Chemical | Chronic Hazard Quotient | | | Lifetime Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Ingestion | Dermal | Inhalation | Ingestion | Dermal | Inhalation |
| **Metals** | | | | | | |
| Arsenic | 3.94E-02 | 3.17E-03 | - | 6.33E-06 | 5.10E-07 | 5.70E-09 |
| Lead | - | - | - | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | - | - | - | 1.35E-08 | 9.77E-09 | na |
| Benzo(a)pyrene | - | - | - | 1.33E-07 | 9.65E-08 | na |
| Benzo(b or k) fluoranthene | - | - | - | 1.79E-08 | 1.29E-08 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 6.19E-05 | 4.48E-05 | - | 1.13E-08 | 8.17E-09 | 8.11E-13 |
| BHC-alpha | - | - | - | 3.09E-09 | 1.79E-09 | 2.23E-13 |
| BHC-beta | - | - | - | 3.64E-09 | 2.11E-09 | 2.62E-13 |
| BHC-delta | - | - | - | na | na | na |
| BHC-gamma | 6.04E-06 | 3.50E-06 | - | 8.41E-10 | 4.88E-10 | na |
| Chlordane-alpha | 2.93E-03 | 2.12E-03 | - | 8.16E-08 | 5.91E-08 | 5.87E-12 |
| Chlordane-gamma | 4.02E-03 | 2.92E-03 | - | 1.12E-07 | 8.12E-08 | 8.07E-12 |
| DDD | - | - | - | 6.79E-09 | 4.93E-09 | na |
| DDE | - | - | - | 8.09E-08 | 5.86E-08 | na |
| DDT | 1.65E-03 | 1.19E-03 | - | 1.00E-07 | 7.25E-08 | 7.20E-12 |
| Dieldrin | 1.92E-03 | 1.39E-03 | - | 5.49E-07 | 3.98E-07 | 3.96E-11 |
| Endosulfan I | 4.22E-07 | 2.72E-07 | - | na | na | na |
| Endosulfan II | 1.06E-06 | 6.84E-07 | - | na | na | na |
| Endrin ketone | - | - | - | na | na | na |
| Heptachlor | 6.72E-06 | 3.90E-06 | - | 5.40E-09 | 3.13E-09 | 3.89E-13 |
| Heptachlor epoxide | 3.11E-03 | 1.81E-03 | - | 1.32E-07 | 7.63E-08 | 9.47E-12 |
| Methoxychlor | 3.47E-06 | 2.01E-06 | - | na | na | na |
| PCB 1254 | 1.39E-03 | 8.07E-04 | - | 7.65E-08 | 4.44E-08 | na |
| Toxaphene | - | - | - | 7.27E-08 | 5.27E-08 | 5.23E-12 |
| Pathway Risk | 5.5 E-02 | 3.13 E-02 | 0.0 E+00 | 7.7 E-06 | 1.5 E-06 | 5.8 E-09 |
| Risk for All Pathways | 6.8 E-02 | | | 9 E-06 | | |

(-) Hazard quotient could not be calculated due to lack of a reference dose

na - not applicable; chemical is not a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor for assessing the potential carcinogenic risk from lead.

Table 5-2
Current Child Trespasser
Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface Soils

| Chemical | Chronic Hazard Quotient | | | Lifetime Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Ingestion | Dermal | Inhalation | Ingestion | Dermal | Inhalation |
| **Metals** | | | | | | |
| Arsenic | 1.03E-01 | 5.75E-03 | - | 5.98E-06 | 3.32E-07 | 2.69E-09 |
| Lead | - | - | - | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | - | - | - | 1.27E-08 | 5.09E-09 | na |
| Benzo(a)pyrene | - | - | - | 1.26E-07 | 5.03E-08 | na |
| Benzo(b or k) fluoranthene | - | - | - | 1.69E-08 | 6.75E-09 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 1.62E-04 | 8.12E-05 | - | 1.06E-08 | 5.32E-09 | 3.83E-13 |
| BHC-alpha | - | - | - | 2.92E-09 | 1.17E-09 | 1.05E-13 |
| BHC-beta | - | - | - | 3.44E-09 | 1.38E-09 | 1.24E-13 |
| BHC-delta | - | - | - | na | na | na |
| BHC-gamma | 1.59E-05 | 6.34E-06 | - | 7.95E-10 | 3.18E-10 | na |
| Chlordane-alpha | 7.69E-03 | 3.84E-03 | - | 7.71E-08 | 3.85E-08 | 2.78E-12 |
| Chlordane-gamma | 1.06E-02 | 5.28E-03 | - | 1.06E-07 | 5.29E-08 | 3.81E-12 |
| DDD | - | - | - | 6.42E-09 | 3.21E-09 | na |
| DDE | - | - | - | 7.64E-08 | 3.82E-08 | na |
| DDT | 4.33E-03 | 2.16E-03 | - | 9.45E-08 | 4.73E-08 | 3.40E-12 |
| Dieldrin | 5.05E-03 | 2.52E-03 | - | 5.19E-07 | 2.60E-07 | 1.87E-11 |
| Endosulfan I | 1.11E-06 | 4.92E-07 | - | na | na | na |
| Endosulfan II | 2.78E-06 | 1.24E-06 | - | na | na | na |
| Endrin ketone | - | - | - | na | na | na |
| Heptachlor | 1.76E-05 | 7.06E-06 | - | 5.10E-09 | 2.04E-09 | 1.84E-13 |
| Heptachlor epoxide | 8.18E-03 | 3.27E-03 | - | 1.24E-07 | 4.97E-08 | 4.48E-12 |
| Methoxychlor | 9.12E-06 | 3.65E-06 | - | na | na | na |
| PCB 1254 | 3.65E-03 | 1.46E-03 | - | 7.23E-08 | 2.89E-08 | na |
| Toxaphene | - | - | - | 6.87E-08 | 3.43E-08 | 2.47E-12 |
| Pathway Risk | 1.4 E-01 | 2.4 E-02 | 0.0 E+00 | 7.3 E-06 | 9.6 E-07 | 2.7 E-09 |
| Risk for All Pathways | 1.7 E-01 | | | 8 E-06 | | |

(-) Hazard quotient could not be calculated due to lack of a reference dose

na - not applicable; chemical is not a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor for assessing the potential carcinogenic risk from lead.

Table 5-3
Current Off-Site Child Resident
Noncarcinogenic and Carcinogenic Risks Associated with
Inhalation of Chemicals in Surface Soils

| Chemical | Inhalation Hazard Quotient | Inhalation Lifetime Cancer Risk |
|---|---|---|
| **Metals** | | |
| Arsenic | - | 1.56E-08 |
| Lead | - | * |
| **Semivolatile organic chemicals** | | |
| Benz(a)anthracene | - | na |
| Benzo(a)pyrene | - | na |
| Benzo(b or k) fluoranthene | - | na |
| **Pesticides/PCBs** | | |
| Aldrin | - | 2.23E-12 |
| BHC-alpha | - | 6.11E-13 |
| BHC-beta | - | 7.20E-13 |
| BHC-delta | - | na |
| BHC-gamma | - | na |
| Chlordane-alpha | - | 1.61E-11 |
| Chlordane-gamma | - | 2.21E-11 |
| DDD | - | na |
| DDE | - | na |
| DDT | - | 1.98E-11 |
| Dieldrin | - | 1.09E-10 |
| Endosulfan I | - | na |
| Endosulfan II | - | na |
| Endrin ketone | - | na |
| Heptachlor | - | 1.07E-12 |
| Heptachlor epoxide | - | 2.60E-11 |
| Methoxychlor | - | na |
| PCB 1254 | - | na |
| Toxaphene | - | 1.44E-11 |
| Pathway Risk | 0.0 E+00 | 2 E-08 |
| Risk for All Pathways | | |

(-) Hazard quotient could not be calculated due to lack of a reference dose

na - not applicable; chemical is not a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor for assessing the potential carcinogenic risk from lead.

Table 5-4

Future Maintenance Worker

Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface and Subsurface Soils

| Chemical | Chronic Hazard Quotient | | | Lifetime Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Ingestion | Dermal | Inhalation | Ingestion | Dermal | Inhalation |
| **Metals** | | | | | | |
| Arsenic | 1.92E-02 | 3.09E-03 | - | 3.09E-06 | 4.97E-07 | 5.56E-09 |
| Lead | - | - | - | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | - | - | - | 6.56E-09 | 9.51E-09 | na |
| Benzo(a)pyrene | - | - | - | 6.48E-08 | 9.40E-08 | na |
| Benzo(b or k) fluoranthene | - | - | - | 8.42E-09 | 1.22E-08 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 3.19E-05 | 4.63E-05 | - | 5.81E-09 | 8.43E-09 | 8.37E-13 |
| BHC-alpha | - | - | - | 1.66E-09 | 1.92E-09 | 2.39E-13 |
| BHC-beta | - | - | - | 1.95E-09 | 2.27E-09 | 2.81E-13 |
| BHC-delta | - | - | - | na | na | na |
| BHC-gamma | 3.14E-06 | 3.65E-06 | - | 4.38E-10 | 5.08E-10 | na |
| Chlordane-alpha | 9.62E-04 | 1.40E-03 | - | 2.68E-08 | 3.89E-08 | 3.86E-12 |
| Chlordane-gamma | 1.58E-03 | 2.29E-03 | - | 4.39E-08 | 6.37E-08 | 6.33E-12 |
| DDD | - | - | - | 4.86E-10 | 7.05E-10 | na |
| DDE | - | - | - | 3.66E-08 | 5.31E-08 | na |
| DDT | 6.72E-04 | 9.74E-04 | - | 4.08E-08 | 5.92E-08 | 5.87E-12 |
| Dieldrin | 7.71E-04 | 1.12E-03 | - | 2.20E-07 | 3.19E-07 | 3.17E-11 |
| Endosulfan I | 2.09E-07 | 2.70E-07 | - | na | na | na |
| Endosulfan II | 5.03E-07 | 6.48E-07 | - | na | na | na |
| Endrin ketone | - | - | - | na | na | na |
| Heptachlor | 3.16E-06 | 3.67E-06 | - | 2.54E-09 | 2.95E-09 | 3.66E-13 |
| Heptachlor epoxide | 1.20E-03 | 1.39E-03 | - | 5.05E-08 | 5.86E-08 | 7.28E-12 |
| Methoxychlor | 1.04E-06 | 1.20E-06 | - | na | na | na |
| PCB 1254 | 7.46E-04 | 8.66E-04 | - | 4.10E-08 | 4.76E-08 | na |
| Toxaphene | - | - | - | 3.44E-08 | 4.99E-08 | 4.96E-12 |
| Pathway Risk | 2.6 E-02 | 1.0 E-02 | 0.0 E+00 | 3.7 E-06 | 1.3 E-06 | 5.6 E-09 |
| Risk for All Pathways | 3.6 E-02 | | | 5 E-06 | | |

(-) Hazard quotient could not be calculated due to lack of a reference dose

na - not applicable; chemical is not a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor for assessing the potential carcinogenic risk from lead.

Table 5-5
Future Child Patron
Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface and Subsurface Soils

| Chemical | Chronic Hazard Quotient | | | Lifetime Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Ingestion | Dermal | Inhalation | Ingestion | Dermal | Inhalation |
| **Metals** | | | | | | |
| Arsenic | 5.04E-02 | 5.60E-03 | - | 2.92E-06 | 3.24E-07 | 2.62E-09 |
| Lead | - | - | - | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | - | - | - | 6.20E-09 | 6.20E-09 | na |
| Benzo(a)pyrene | - | - | - | 6.12E-08 | 6.12E-08 | na |
| Benzo(b or k) fluoranthene | - | - | - | 7.96E-09 | 7.96E-09 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 8.37E-05 | 8.37E-05 | - | 5.49E-09 | 5.49E-09 | 3.95E-13 |
| BHC-alpha | - | - | - | 1.57E-09 | 1.25E-09 | 1.13E-13 |
| BHC-beta | - | - | - | 1.85E-09 | 1.48E-09 | 1.33E-13 |
| BHC-delta | - | - | - | na | na | na |
| BHC-gamma | 8.25E-06 | 6.60E-06 | - | 4.14E-10 | 3.31E-10 | na |
| Chlordane-alpha | 2.53E-03 | 2.53E-03 | - | 2.53E-08 | 2.53E-08 | 1.82E-12 |
| Chlordane-gamma | 4.14E-03 | 4.14E-03 | - | 4.15E-08 | 4.15E-08 | 2.99E-12 |
| DDD | - | - | - | 4.60E-10 | 4.60E-10 | na |
| DDE | - | - | - | 3.46E-08 | 3.46E-08 | na |
| DDT | 1.76E-03 | 1.76E-03 | - | 3.86E-08 | 3.86E-08 | 2.78E-12 |
| Dieldrin | 2.02E-03 | 2.02E-03 | - | 2.08E-07 | 2.08E-07 | 1.50E-11 |
| Endosulfan I | 5.49E-07 | 4.88E-07 | - | na | na | na |
| Endosulfan II | 1.32E-06 | 1.17E-06 | - | na | na | na |
| Endrin ketone | - | - | - | na | na | na |
| Heptachlor | 8.31E-06 | 6.65E-06 | - | 2.40E-09 | 1.92E-09 | 1.73E-13 |
| Heptachlor epoxide | 3.14E-03 | 2.51E-03 | - | 4.78E-08 | 3.82E-08 | 3.44E-12 |
| Methoxychlor | 2.72E-06 | 2.18E-06 | - | na | na | na |
| PCB 1254 | 1.96E-03 | 1.57E-03 | - | 3.88E-08 | 3.10E-08 | na |
| Toxaphene | - | - | - | 3.25E-08 | 3.25E-08 | 2.34E-12 |
| Pathway Risk | 6.6 E-02 | 2.0 E-02 | 0.0 E-00 | 3.5 E-05 | 8.6 E-07 | 2.7 E-09 |
| Risk for All Pathways | | 8.6 E-02 | | | 4 E-06 | |

(-) Hazard quotient could not be calculated due to lack of a reference dose

na - not applicable; chemical is not a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor for assessing the potential carcinogenic risk from lead.

Table 5-6
Future Construction Worker
Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface and Subsurface Soils

| Chemical | Subchronic Hazard Quotient | | | Lifetime Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Ingestion | Dermal | Inhalation | Ingestion | Dermal | Inhalation |
| **Metals** | | | | | | |
| Arsenic | 2.21E-01 | 1.12E-02 | - | 1.42E-06 | 7.22E-08 | 4.44E-07 |
| Lead | - | - | - | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | - | - | - | 3.02E-09 | 1.38E-09 | na |
| Benzo(a)pyrene | - | - | - | 2.99E-08 | 1.36E-08 | na |
| Benzo(b or k) fluoranthene | - | - | - | 3.88E-09 | 1.77E-09 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 3.68E-04 | 1.68E-04 | - | 2.68E-09 | 1.22E-09 | 6.69E-11 |
| BHC-alpha | - | - | - | 7.64E-10 | 2.79E-10 | 1.91E-11 |
| BHC-beta | - | - | - | 9.00E-10 | 3.29E-10 | 2.25E-11 |
| BHC-delta | - | - | - | na | na | na |
| BHC-gamma | 3.62E-05 | 1.32E-05 | - | 2.02E-10 | 7.38E-11 | na |
| Chlordane-alpha | 1.11E-02 | 5.07E-03 | - | 1.24E-08 | 5.64E-09 | 3.09E-10 |
| Chlordane-gamma | 1.82E-02 | 8.30E-03 | - | 2.02E-08 | 9.25E-09 | 5.06E-10 |
| DDD | - | - | - | 2.24E-10 | 1.02E-10 | na |
| DDE | - | - | - | 1.69E-08 | 7.71E-09 | na |
| DDT | 7.74E-03 | 3.54E-03 | - | 1.88E-08 | 8.59E-09 | 4.70E-10 |
| Dieldrin | 8.88E-03 | 4.06E-03 | - | 1.02E-07 | 4.64E-08 | 2.54E-09 |
| Endosulfan I | 2.41E-06 | 9.79E-07 | - | na | na | na |
| Endosulfan II | 5.79E-06 | 2.35E-06 | - | na | na | na |
| Endrin ketone | - | - | - | na | na | na |
| Heptachlor | 3.65E-05 | 1.33E-05 | - | 1.17E-09 | 4.28E-10 | 2.93E-11 |
| Heptachlor epoxide | 1.38E-02 | 5.04E-03 | - | 2.33E-08 | 8.51E-09 | 5.82E-10 |
| Methoxychlor | 1.19E-05 | 4.37E-06 | - | na | na | na |
| PCB 1254 | 8.60E-03 | 3.14E-03 | - | 1.89E-08 | 6.92E-09 | na |
| Toxaphene | - | - | - | 1.59E-08 | 7.25E-09 | 3.96E-10 |
| Pathway Risk | 2.9E-01 | 3.1E-02 | 0.0E+00 | 1.2E-06 | 1.9E-02 | 4.5E-07 |
| Risk for All Pathways | 3.3E-01 | | | 2E-06 | | |

(-) Hazard quotient could not be calculated due to lack of a reference dose

na - not applicable; chemical is not a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor for assessing the potential carcinogenic risk from lead.

**Table 5-7**
**Future Institutional Worker**
**Noncarcinogenic and Carcinogenic Risks Associated with Exposure to Chemicals in Surface and Subsurface Soils**

| Chemical | Chronic Hazard Quotient | | | Lifetime Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Ingestion | Dermal | Inhalation | Ingestion | Dermal | Inhalation |
| **Metals** | | | | | | |
| Arsenic | 3.36E-02 | 7.74E-03 | - | 5.40E-06 | 1.24E-06 | 2.78E-08 |
| Lead | - | - | - | * | * | * |
| **Semivolatile organic chemicals** | | | | | | |
| Benz(a)anthracene | - | - | - | 1.15E-08 | 2.38E-08 | na |
| Benzo(a)pyrene | - | - | - | 1.13E-07 | 2.35E-07 | na |
| Benzo(b or k) fluoranthene | - | - | - | 1.47E-08 | 3.05E-08 | na |
| **Pesticides/PCBs** | | | | | | |
| Aldrin | 5.58E-05 | 1.16E-04 | - | 1.02E-08 | 2.11E-08 | 4.18E-12 |
| BHC-alpha | - | - | - | 2.90E-09 | 4.81E-09 | 1.19E-12 |
| BHC-beta | - | - | - | 3.42E-09 | 5.66E-09 | 1.41E-12 |
| BHC-delta | - | - | - | na | na | na |
| BHC-gamma | 5.50E-06 | 9.12E-06 | - | 7.66E-10 | 1.27E-09 | na |
| Chlordane-alpha | 1.68E-03 | 3.49E-03 | - | 4.69E-08 | 9.72E-08 | 1.93E-11 |
| Chlordane-gamma | 2.76E-03 | 5.72E-03 | - | 7.69E-08 | 1.59E-07 | 3.16E-11 |
| DDD | - | - | - | 8.51E-10 | 1.76E-09 | na |
| DDE | - | - | - | 6.40E-08 | 1.33E-07 | na |
| DDT | 1.18E-03 | 2.44E-03 | - | 7.14E-08 | 1.48E-07 | 2.94E-11 |
| Dieldrin | 1.35E-03 | 2.80E-03 | - | 3.86E-07 | 7.99E-07 | 1.59E-10 |
| Endosulfan I | 3.66E-07 | 6.74E-07 | - | na | na | na |
| Endosulfan II | 8.80E-07 | 1.62E-06 | - | na | na | na |
| Endrin ketone | - | - | - | na | na | na |
| Heptachlor | 5.54E-06 | 9.18E-06 | - | 4.45E-09 | 7.38E-09 | 1.83E-12 |
| Heptachlor epoxide | 2.09E-03 | 3.47E-03 | - | 8.84E-08 | 1.47E-07 | 3.64E-11 |
| Methoxychlor | 1.82E-06 | 3.01E-06 | - | na | na | na |
| PCB 1254 | 1.31E-03 | 2.16E-03 | - | 7.18E-08 | 1.19E-07 | na |
| Toxaphene | - | - | - | 6.02E-08 | 1.25E-07 | 2.48E-11 |
| Pathway Risk | 4.4 E-02 | 2.8 E-02 | 0.0 E-00 | 6.4 E-06 | 3.3 E-06 | 2.8 E-08 |
| Risk for All Pathways | | 7.2 E-02 | | | 1 E-05 | |

(-) Hazard quotient could not be calculated due to lack of a reference dose

na - not applicable; chemical is not a potential carcinogen

*-lead is considered to be a probable human carcinogen by the USEPA. There is no slope factor for assessing the potential carcinogenic risk from lead.

## 6.0 SUMMARY AND CONCLUSIONS

The objective of the risk assessment for the Woolfolk Operable Unit #2 (OU-2) was to evaluate possible human risks that may be associated with current or future exposure to chemicals detected in soils.

Chemicals of concern in OU-2 soils were determined by comparison of detected soil concentrations to eastern US or urban background concentrations. With the exception of arsenic and lead, detected concentrations of metals were within typical background soil concentrations or lower than USEPA soil screening levels for residential property. Arsenic and lead were retained as chemicals of concern. Detected concentrations of polynuclear aromatic hydrocarbons (PAHs) were also compared to typical urban background concentrations to screen out chemicals that are associated with typical urban background sources. With the exception of 2-methylnaphthalene and naphthalene, average detected concentrations were within a factor of two of typical concentrations detected in urban soils. The PAHs benzo(a)anthracene, benzo(a)pyrene, and benzo(b or k)fluoranthene exceeded USEPA soil screening levels for residential areas. These PAH compounds were retained as chemicals of concern. All pesticides detected in OU-2 soils were retained as chemicals of concern.

Possible pathways of human exposure to the chemicals of concern in OU-2 soils were evaluated under current and proposed future site conditions. Much of the OU-2 property is the proposed site of a future community library. As such, possible receptors exposed to soils as a result of future use of OU-2 as the site of a library were identified. The potential current and future receptors and complete pathways of exposure to chemicals in OU-2 soils are listed below.

**Current Site Conditions**

<u>On-site Maintenance Worker</u>
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

<u>On-site Child Trespasser</u>
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

<u>Off-site Child Resident</u>
Inhalation of chemicals in OU-2 surface soils

**Future Site Conditions**

<u>On-site Maintenance Worker</u>
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

<u>On-site Child Patron</u>
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

On-site Construction Worker
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

On-site Institutional Worker
Ingestion, skin contact, and inhalation of chemicals in OU-2 surface soils

Calculated noncancer and lifetime cancer risks associated with exposure to the chemicals of concern in OU-2 soils are summarized in Table 6-1. As determined by calculating hazard indices, it is unlikely that current or future human receptors would experience noncarcinogenic adverse health effects as a result of exposure to the chemicals of concern in OU-2 soils.

Calculated lifetime cancer risks for current receptors exposed to soil were 9 E-06, 8 E-06, and 2 E-08 for the maintenance worker, child trespasser, and off-site child resident, respectively. These lifetime cancer risks are below or within the 1 E-06 (one in one million) to 1 E-04 (one in ten thousand) range of acceptable added lifetime cancer risk established by the USEPA. Calculated lifetime cancer risks were primarily due to arsenic and dieldrin in soil.

Calculated lifetime cancer risks for future receptors exposed to OU-2 soils were 5 E-06, 4 E-06, 2 E-06, and 1 E-05 for the maintenance worker, child patron, construction worker, and institutional worker, respectively. As with the current receptors, calculated lifetime cancer risks resulting from exposure to OU-2 soils were due primarily to arsenic and dieldrin. These added lifetime cancer risks are also within the range considered acceptable by the USEPA.

Risk posed by exposure to lead in OU-2 soil was evaluated using the USEPA's IEUBK lead model. Because this model is applicable only to children ages 7 years and younger, lead risk was evaluated only for the off-site child resident. However, young children are widely recognized as being the most sensitive receptor for lead exposure and toxicity. Thus, risks calculated for a young child receptor can be considered to conservatively account for risks for less sensitive receptors such as older children and adults.

Given conservative USEPA default assumptions regarding exposure to lead in soil, air, water, and food, the resulting geometric mean blood lead concentrations calculated using the IEUBK lead model were below 10 μg/dl. The probability of a blood lead concentration in excess of 10 μg/dl was acceptably low (2.7%) in the most sensitive age group (1 to 2 years) assumed to be exposed to lead in soil.

In summary, assessment of potential health risks resulting from exposure to chemicals in OU-2 soils indicates that:

- Current and future human receptors that may be exposed to chemicals in OU-2 soils would be unlikely to experience noncarcinogenic health effects.

- Lifetime cancer risks calculated for current and future receptors exposed to soils were at or below 1 E-05. These calculated lifetime cancer risks are within the 1E-06 to 1E-04 range of risks accepted by the USEPA.

- Exposure to lead at the concentrations detected in OU-2 soils is very unlikely to result in blood lead concentrations that would exceed the 10 μg/dl target blood lead concentration established by the CDC and USEPA.

## Table 6-1
## Risk Summary Table

| Potentially Exposed Population | Route of Exposure to Chemicals in Soil | Risk Posed by Chemicals of Concern | |
|---|---|---|---|
| | | Hazard Index | Lifetime Cancer Risk |
| **Current Maintenance Worker** | | | |
| | Incidental ingestion of surface soils | 5.5E-02 | 7.7 E-06 |
| | Dermal contact with surface soils | 1.3E-02 | 1.5 E-06 |
| | Inhalation of chemicals released from surface soil as fugitive dusts | - | 5.8 E-09 |
| | | Sum = 6.8E-02 | Sum = 9 E-06 |
| **Current Child Trespasser** | | | |
| | Incidental ingestion of surface soils | 1.4E-01 | 7.3 E-06 |
| | Dermal contact with surface soils | 2.4 E-02 | 9.6 E-07 |
| | Inhalation of chemicals released from surface soil as fugitive dusts | - | 2.7 E-09 |
| | | Sum = 1.7E-01 | Sum = 8 E-06 |
| **Current Child Resident** | | | |
| | Inhalation of chemicals released from surface soil as fugitive dusts | - | 2 E-08 |

## Table 6-1 (continued)

| Potentially Exposed Population | Route of Exposure to Chemicals in Soil | Risk Posed by Chemicals of Concern: Hazard Index | Risk Posed by Chemicals of Concern: Lifetime Cancer Risk |
|---|---|---|---|
| **Future Maintenance Worker** | | | |
| | Incidental ingestion of soils | 2.5E-02 | 3.7 E-06 |
| | Dermal contact with soils | 1.1E-02 | 1.3 E-06 |
| | Inhalation of chemicals released from soil as fugitive dusts | - | 5.6 E-09 |
| | | Sum = 3.6E-02 | Sum = 5 E-06 |
| **Future Child Patron** | | | |
| | Incidental ingestion of soils | 1.4 E-01 | 3.5 E-06 |
| | Dermal contact with soils | 2.4 E-02 | 8.6 E-07 |
| | Inhalation of chemicals released from soil as fugitive dusts | - | 2.7 E-09 |
| | | Sum = 8.6E-02 | Sum = 4 E-06 |
| **Future Construction Worker** | | | |
| | Incidental ingestion of soils | 2.9 E-01 | 1.7 E-06 |
| | Dermal contact with soils | 2.8 E-02 | 1.9 E-07 |
| | Inhalation of chemicals released from soil as fugitive dusts | - | 4.5 E-07 |
| | | Sum = 3.3E-01 | Sum = 2 E-06 |
| **Future Institutional Worker** | | | |
| | Incidental ingestion of soils | 4.4 E-02 | 6.4 E-06 |
| | Dermal contact with soils | 2.8 E-02 | 3.3 E-06 |
| | Inhalation of chemicals released from soil as fugitive dusts | - | 2.8 E-08 |
| | | Sum = 7.2E-02 | Sum = 1 E-05 |

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# Attachment A

## Integrated Exposure Uptake Biokinetic Model
## Blood Lead Calculations

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

| Age | Time Outdoors (hr) | Vent. Rate (m3/day) | Lung Abs. (%) |
|---|---|---|---|
| 0-1 | 1.0 | 2.0 | 32.0 |
| 1-2 | 2.0 | 3.0 | 32.0 |
| 2-3 | 3.0 | 5.0 | 32.0 |
| 3-4 | 4.0 | 5.0 | 32.0 |
| 4-5 | 4.0 | 5.0 | 32.0 |
| 5-6 | 4.0 | 7.0 | 32.0 |
| 6-7 | 4.0 | 7.0 | 32.0 |

DIET: DEFAULT

DRINKING WATER Conc: 4.00 ug Pb/L DEFAULT
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: Multiple Source Analysis

| Age | Soil (ug Pb/g) | House Dust (ug Pb/g) |
|---|---|---|
| 0-1 | 193.0 | 145.1 |
| 1-2 | 193.0 | 145.1 |
| 2-3 | 193.0 | 145.1 |
| 3-4 | 193.0 | 145.1 |
| 4-5 | 193.0 | 145.1 |
| 5-6 | 193.0 | 145.1 |
| 6-7 | 193.0 | 145.1 |

Additional Dust Sources: None DEFAULT
Soil contribution conversion factor: 0.70
Air contribution conversion factor: 100.0

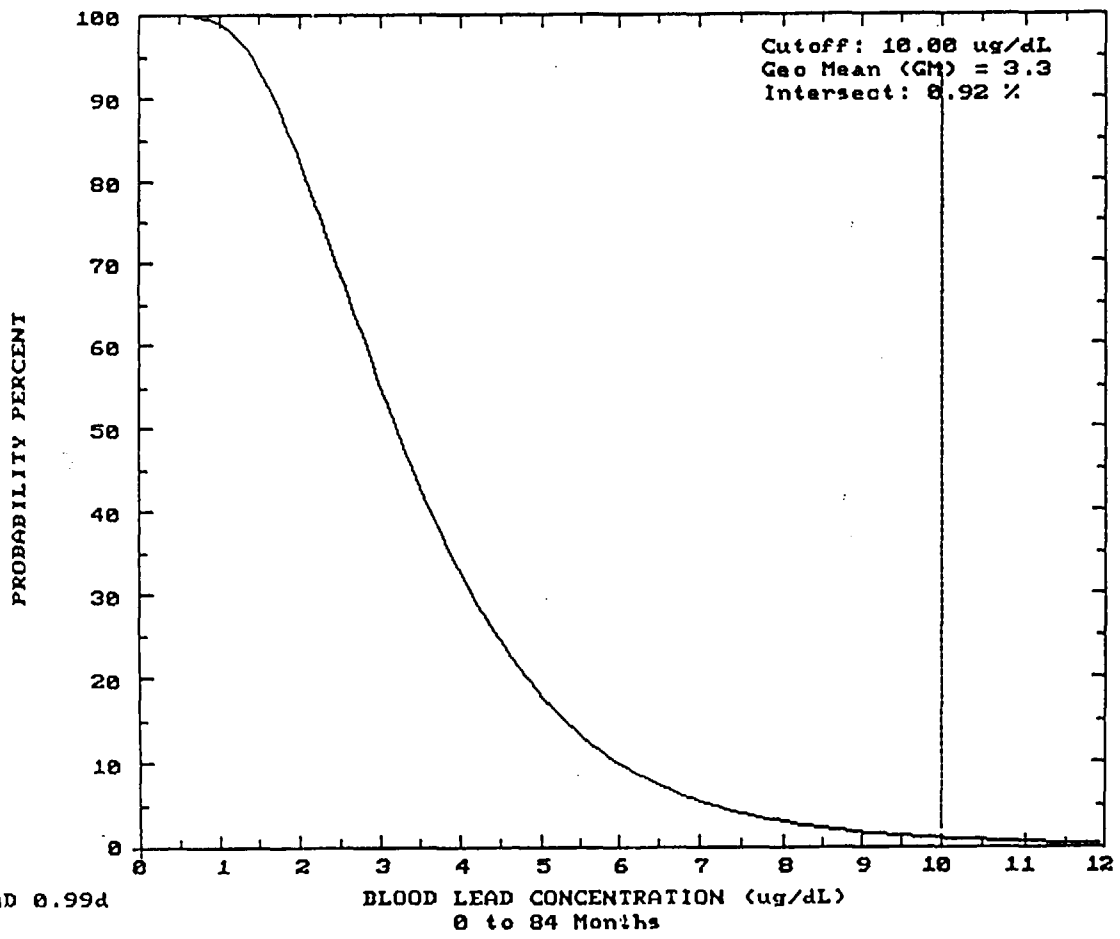
PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

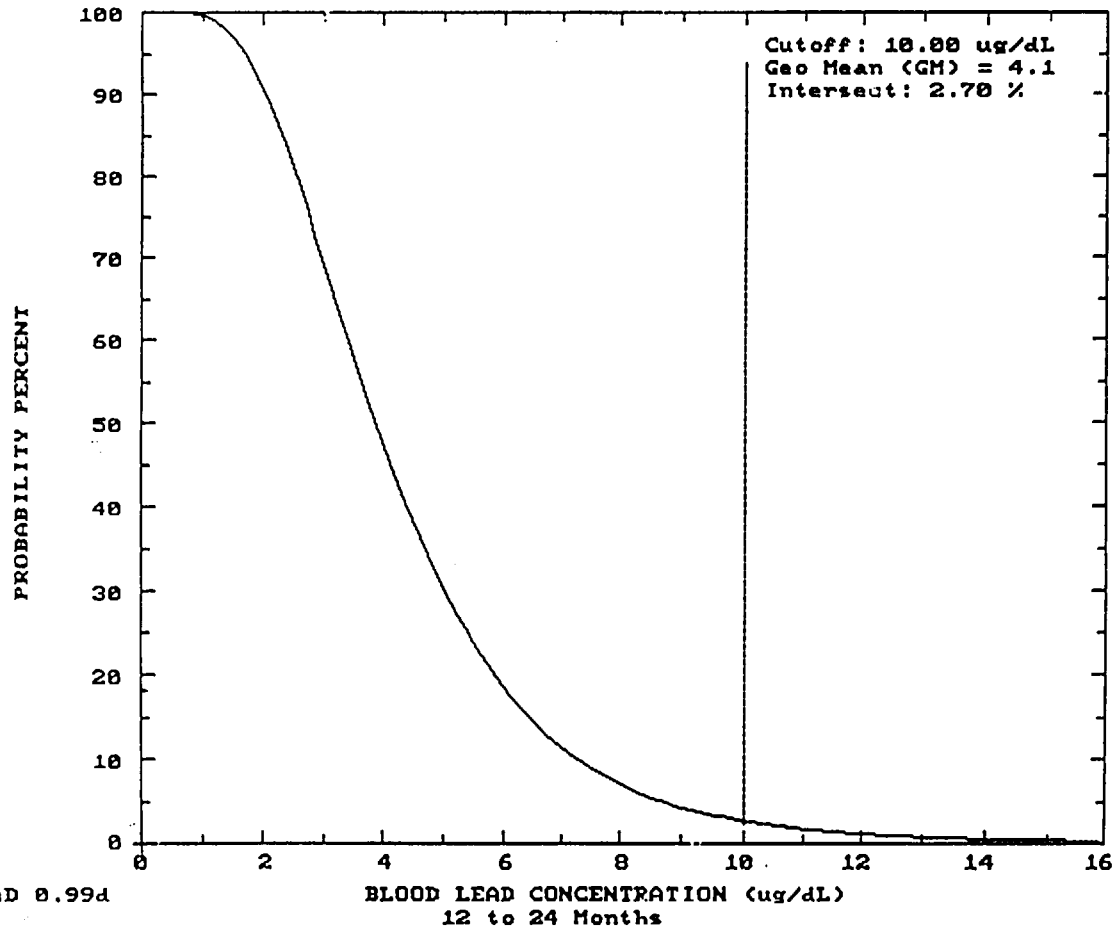
CALCULATED BLOOD Pb and Pb UPTAKES:

| YEAR | Blood Level (ug/dL) | Total Uptake (ug/day) | Soil+Dust Uptake (ug/day) |
|---|---|---|---|
| 0.5-1: | 3.7 | 6.88 | 3.93 |
| 1-2: | 4.1 | 9.80 | 6.19 |
| 2-3: | 3.8 | 10.28 | 6.25 |
| 3-4: | 3.6 | 10.31 | 6.32 |
| 4-5: | 3.1 | 8.75 | 4.77 |
| 5-6: | 2.7 | 8.57 | 4.32 |
| 6-7: | 2.5 | 8.69 | 4.09 |

| YEAR | Diet Uptake (ug/day) | Water Uptake (ug/day) | Paint Uptake (ug/day) | Air Uptake (ug/day) |
|---|---|---|---|---|
| 0.5-1: | 2.56 | 0.37 | 0.00 | 0.02 |
| 1-2: | 2.65 | 0.92 | 0.00 | 0.03 |
| 2-3: | 3.01 | 0.96 | 0.00 | 0.06 |
| 3-4: | 2.92 | 0.99 | 0.00 | 0.07 |
| 4-5: | 2.87 | 1.05 | 0.00 | 0.07 |
| 5-6: | 3.04 | 1.11 | 0.00 | 0.09 |
| 6-7: | 3.37 | 1.14 | 0.00 | 0.09 |


Cutoff: 10.00 ug/dL
Geo Mean (GM) = 3.3
Intersect: 0.92 %
PROBABILITY PERCENT
100
90
80
70
60
50
40
30
20
10
0
0
1
2
3
4
5
6
7
8
9
10
11
12
BLOOD LEAD CONCENTRATION (ug/dL)
0 to 84 Months

LEAD 0.99d


Cutoff: 10.00 ug/dL
Geo Mean (GM) = 4.1
Intersect: 2.70 %
PROBABILITY PERCENT
100
90
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
14
16
BLOOD LEAD CONCENTRATION (ug/dL)
12 to 24 Months

LEAD 0.99d

# Attachment B

## Soil Action Levels for the Chemicals of Concern

Calculated soil action levels are based on the equations presented below and assumptions presented in Tables 3-1 and 3-2 of Appendix A and the reference doses and slope factors presented in Tables 4-1 and 4-2.

For potential carcinogens:

$$Csoil = \frac{TR \times BW \times AT}{EF \times ED \times 10^{-6}\,kg/mg \times [(SF_o \times IR \times FI \times BA) + (SF_d \times SA \times AF \times ABS) + (SFi \times PC \times VR)]}$$

where:
$C_{soil}$ = soil action level
TR = target risk level
SFo = oral slope factor
SFd = dermal slope factor derived from the oral slope factor
SFi = inhalation slope factor
(all other variables are used as they are defined in the risk assessment)

For noncarcinogens:

$$Csoil = \frac{HQ \times BW \times ED \times 365\,days/year}{EF \times ED \times 10^{-6}\,kg/mg \times [(\frac{1}{RfDo} \times IR \times FI \times BA) + (\frac{1}{RfDd} \times SA \times AF \times ABS) + (\frac{1}{RfDi} \times PC \times VR)]}$$

where:
$C_{soil}$ = soil action level
HQ = target hazard quotient (which = 1)
RfDo = oral reference dose
RfDd = dermal reference dose derived from the oral reference dose
RfDi = inhalation reference dose
(all other variables are used as they are defined in the risk assessment)

**Attachment B Table 1**
**Soil Action Levels**
**Current Maintenance Worker**

| Chemical | Soil Action Level Noncancer Risk (mg/kg) | Soil Action Level Based on a Lifetime Cancer Risk $2\times10^{-6}$ (mg/kg) | $1\times10^{-5}$ (mg/kg) | $1\times10^{-4}$ (mg/kg) |
|---|---|---|---|---|
| **Metals** | | | | |
| Arsenic | 1.77E+03 | 1.10E+03 | 1.10E+02 | 1.10E+01 |
| Lead | - | na | na | na |
| **Semivolatile organic chemicals** | | | | |
| Benz(a)anthracene | - | 1.14E+03 | 1.14E+02 | 1.14E+01 |
| Benzo(a)pyrene | - | 1.14E+02 | 1.14E+01 | 1.14E+00 |
| Benzo(b or k) fluoranthene | - | 1.14E+03 | 1.14E+02 | 1.14E+01 |
| **Pesticides/PCBs** | | | | |
| Aldrin | 8.89E+01 | 4.88E+01 | 4.88E+00 | 4.88E-01 |
| BHC-alpha | - | 1.44E+02 | 1.44E+01 | 1.44E+00 |
| BHC-beta | - | 5.03E+02 | 5.03E+01 | 5.03E+00 |
| BHC-delta | - | na | na | na |
| BHC-gamma | 9.70E+02 | 6.97E+02 | 6.97E+01 | 6.97E+00 |
| Chlordane-alpha | 1.78E+02 | 6.38E+02 | 6.38E+01 | 6.38E+00 |
| Chlordane-gamma | 1.78E+02 | 6.38E+02 | 6.38E+01 | 6.38E+00 |
| DDD | - | 3.46E+03 | 3.46E+02 | 3.46E+01 |
| DDE | - | 2.44E+03 | 2.44E+02 | 2.44E+01 |
| DDT | 1.48E+03 | 2.44E+03 | 2.44E+02 | 2.44E+01 |
| Dieldrin | 1.48E+02 | 5.18E+01 | 5.18E+00 | 5.18E-01 |
| Endosulfan I | 1.86E+04 | na | na | na |
| Endosulfan II | 1.86E+04 | na | na | na |
| Endrin ketone | - | na | na | na |
| Heptachlor | 1.62E+03 | 2.01E+02 | 2.01E+01 | 2.01E+00 |
| Heptachlor epoxide | 4.20E+01 | 9.95E+01 | 9.95E+00 | 9.95E-01 |
| Methoxychlor | 1.62E+04 | na | na | na |
| PCB 1254 | 6.47E+01 | 1.18E+02 | 1.18E+01 | 1.18E+00 |
| Toxaphene | - | 7.54E+02 | 7.54E+01 | 7.54E+00 |

na-not applicable (not a potential carcinogen)

(-)- due to lack of reference dose, action level could not be calculated

**Attachment B Table 2**
**Soil Action Levels**
**Current Child Trespasser**

| Chemical | Soil Action Level Noncancer Risk (mg/kg) | Soil Action Level Based on a Lifetime Cancer Risk $1 \times 10^{-6}$ (mg/kg) | $1 \times 10^{-7}$ (mg/kg) | $1 \times 10^{-8}$ (mg/kg) |
|---|---|---|---|---|
| **Metals** | | | | |
| Arsenic | 6.92E+02 | 1.19E+03 | 1.19E+02 | 1.19E+01 |
| Lead | - | na | na | na |
| **Semivolatile organic chemicals** | | | | |
| Benz(a)anthracene | - | 1.48E+03 | 1.48E+02 | 1.48E+01 |
| Benzo(a)pyrene | - | 1.48E+02 | 1.48E+01 | 1.48E+00 |
| Benzo(b or k) fluoranthene | - | 1.48E+03 | 1.48E+02 | 1.48E+01 |
| **Pesticides/PCBs** | | | | |
| Aldrin | 3.89E+01 | 5.94E+01 | 5.94E+00 | 5.94E-01 |
| BHC-alpha | - | 1.72E+02 | 1.72E+01 | 1.72E+00 |
| BHC-beta | - | 6.01E+02 | 6.01E+01 | 6.01E+00 |
| BHC-delta | - | na | na | na |
| BHC-gamma | 4.17E+02 | 8.32E+02 | 8.32E+01 | 8.32E+00 |
| Chlordane-alpha | 7.79E+01 | 7.76E+02 | 7.76E+01 | 7.76E+00 |
| Chlordane-gamma | 7.79E+01 | 7.76E+02 | 7.76E+01 | 7.76E+00 |
| DDD | - | 4.21E+03 | 4.21E+02 | 4.21E+01 |
| DDE | - | 2.97E+03 | 2.97E+02 | 2.97E+01 |
| DDT | 6.49E+02 | 2.97E+03 | 2.97E+02 | 2.97E+01 |
| Dieldrin | 6.49E+01 | 6.31E+01 | 6.31E+00 | 6.31E-01 |
| Endosulfan I | 8.09E+03 | na | na | na |
| Endosulfan II | 8.09E+03 | na | na | na |
| Endrin ketone | - | na | na | na |
| Heptachlor | 6.95E+02 | 2.40E+02 | 2.40E+01 | 2.40E+00 |
| Heptachlor epoxide | 1.81E+01 | 1.19E+02 | 1.19E+01 | 1.19E+00 |
| Methoxychlor | 6.95E+03 | na | na | na |
| PCB 1254 | 2.78E+01 | 1.40E+02 | 1.40E+01 | 1.40E+00 |
| Toxaphene | - | 9.18E+02 | 9.18E+01 | 9.18E+00 |

na-not applicable (not a potential carcinogen)

(-)- due to lack of reference dose, action level could not be calculated

**Attachment B Table 3**
**Soil Action Levels**
**Current Off-Site Child Resident**

| Chemical | Soil Action Level Noncancer Risk (mg/kg) | Soil Action Level Based on a Lifetime Cancer Risk | | |
|---|---|---|---|---|
| | | $1 \times 10^{-6}$ (mg/kg) | $1 \times 10^{-5}$ (mg/kg) | $1 \times 10^{-4}$ (mg/kg) |
| **Metals** | | | | |
| Arsenic | - | 4.83E+05 | 4.83E+04 | 4.83E+03 |
| Lead | - | na | na | na |
| **Semivolatile organic chemicals** | | | | |
| Benz(a)anthracene | - | na | na | na |
| Benzo(a)pyrene | - | na | na | na |
| Benzo(b or k) fluoranthene | - | na | na | na |
| **Pesticides/PCBs** | | | | |
| Aldrin | - | 4.26E+05 | 4.26E+04 | 4.26E+03 |
| BHC-alpha | - | 1.15E+06 | 1.15E+05 | 1.15E+04 |
| BHC-beta | - | 4.02E+06 | 4.02E+05 | 4.02E+04 |
| BHC-delta | - | na | na | na |
| BHC-gamma | - | na | na | na |
| Chlordane-alpha | - | 5.57E+06 | 5.57E+05 | 5.57E+04 |
| Chlordane-gamma | - | 5.57E+06 | 5.57E+05 | 5.57E+04 |
| DDD | - | na | na | na |
| DDE | - | na | na | na |
| DDT | - | 2.13E+07 | 2.13E+06 | 2.13E+05 |
| Dieldrin | - | 4.53E+05 | 4.53E+04 | 4.53E+03 |
| Endosulfan I | - | na | na | na |
| Endosulfan II | - | na | na | na |
| Endrin ketone | - | na | na | na |
| Heptachlor | - | 1.61E+06 | 1.61E+05 | 1.61E+04 |
| Heptachlor epoxide | - | 7.96E+05 | 7.96E+04 | 7.96E+03 |
| Methoxychlor | - | na | na | na |
| PCB 1254 | - | na | na | na |
| Toxaphene | - | 6.58E+06 | 6.58E+05 | 6.58E+04 |

na-not applicable (not a potential carcinogen)

(-)- due to lack of reference dose, action level could not be calculated

**Attachment B Table 4**
**Soil Action Levels**
**Future Maintenance Worker**

| Chemical | Soil Action Level Noncancer Risk (mg/kg) | Soil Action Level Based on a Lifetime Cancer Risk $1 \times 10^{-6}$ (mg/kg) | $1 \times 10^{-5}$ (mg/kg) | $1 \times 10^{-4}$ (mg/kg) |
|---|---|---|---|---|
| **Metals** | | | | |
| Arsenic | 3.30E+03 | 2.05E+03 | 2.05E+02 | 2.05E+01 |
| Lead | - | na | na | na |
| **Semivolatile organic chemicals** | | | | |
| Benz(a)anthracene | - | 1.60E+03 | 1.60E+02 | 1.60E+01 |
| Benzo(a)pyrene | - | 1.60E+02 | 1.60E+01 | 1.60E+00 |
| Benzo(b or k) fluoranthene | - | 1.60E+03 | 1.60E+02 | 1.60E+01 |
| **Pesticides/PCBs** | | | | |
| Aldrin | 1.25E+02 | 6.87E+01 | 6.87E+00 | 6.87E-01 |
| BHC-alpha | - | 2.10E+02 | 2.10E+01 | 2.10E+00 |
| BHC-beta | - | 7.36E+02 | 7.36E+01 | 7.36E+00 |
| BHC-delta | - | na | na | na |
| BHC-gamma | 1.42E+03 | 1.02E+03 | 1.02E+02 | 1.02E+01 |
| Chlordane-alpha | 2.50E+02 | 8.98E+02 | 8.98E+01 | 8.98E+00 |
| Chlordane-gamma | 2.50E+02 | 8.98E+02 | 8.98E+01 | 8.98E+00 |
| DDD | - | 4.87E+03 | 4.87E+02 | 4.87E+01 |
| DDE | - | 3.44E+03 | 3.44E+02 | 3.44E+01 |
| DDT | 2.09E+03 | 3.44E+03 | 3.44E+02 | 3.44E+01 |
| Dieldrin | 2.09E+02 | 7.30E+01 | 7.30E+00 | 7.30E-01 |
| Endosulfan I | 2.68E+04 | na | na | na |
| Endosulfan II | 2.68E+04 | na | na | na |
| Endrin ketone | - | na | na | na |
| Heptachlor | 2.37E+03 | 2.94E+02 | 2.94E+01 | 2.94E+00 |
| Heptachlor epoxide | 6.15E+01 | 1.46E+02 | 1.46E+01 | 1.46E+00 |
| Methoxychlor | 2.37E+04 | na | na | na |
| PCB 1254 | 9.46E+01 | 1.72E+02 | 1.72E+01 | 1.72E+00 |
| Toxaphene | - | 1.06E+03 | 1.06E+02 | 1.06E+01 |

na-not applicable (not a potential carcinogen)

(-)- due to lack of reference dose, action level could not be calculated

**Attachment B Table 5**
**Soil Action Levels**
**Future Child Patron**

| Chemical | Soil Action Level Noncancer Risk (mg/kg) | Soil Action Level Based on a Lifetime Cancer Risk $1 \times 10^{-6}$ (mg/kg) | $1 \times 10^{-5}$ (mg/kg) | $1 \times 10^{-4}$ (mg/kg) |
|---|---|---|---|---|
| **Metals** | | | | |
| Arsenic | 1.31E+03 | 2.27E+03 | 2.27E+02 | 2.27E+01 |
| Lead | - | na | na | na |
| **Semivolatile organic chemicals** | | | | |
| Benz(a)anthracene | - | 2.07E+03 | 2.07E+02 | 2.07E+01 |
| Benzo(a)pyrene | - | 2.07E+02 | 2.07E+01 | 2.07E+00 |
| Benzo(b or k) fluoranthene | - | 2.07E+03 | 2.07E+02 | 2.07E+01 |
| **Pesticides/PCBs** | | | | |
| Aldrin | 5.84E+01 | 8.91E+01 | 8.91E+00 | 8.91E-01 |
| BHC-alpha | - | 2.67E+02 | 2.67E+01 | 2.67E+00 |
| BHC-beta | - | 9.35E+02 | 9.35E+01 | 9.35E+00 |
| BHC-delta | - | na | na | na |
| BHC-gamma | 6.49E+02 | 1.29E+03 | 1.29E+02 | 1.29E+01 |
| Chlordane-alpha | 1.17E+02 | 1.16E+03 | 1.16E+02 | 1.16E+01 |
| Chlordane-gamma | 1.17E+02 | 1.16E+03 | 1.16E+02 | 1.16E+01 |
| DDD | - | 6.31E+03 | 6.31E+02 | 6.31E+01 |
| DDE | - | 4.45E+03 | 4.45E+02 | 4.45E+01 |
| DDT | 9.73E+02 | 4.45E+03 | 4.45E+02 | 4.45E+01 |
| Dieldrin | 9.73E+01 | 9.46E+01 | 9.46E+00 | 9.46E-01 |
| Endosulfan I | 1.24E+04 | na | na | na |
| Endosulfan II | 1.24E+04 | na | na | na |
| Endrin ketone | - | na | na | na |
| Heptachlor | 1.08E+03 | 3.74E+02 | 3.74E+01 | 3.74E+00 |
| Heptachlor epoxide | 2.81E+01 | 1.85E+02 | 1.85E+01 | 1.85E+00 |
| Methoxychlor | 1.08E+04 | na | na | na |
| PCB 1254 | 4.33E+01 | 2.18E+02 | 2.18E+01 | 2.18E+00 |
| Toxaphene | - | 1.38E+03 | 1.38E+02 | 1.38E+01 |

na-not applicable (not a potential carcinogen)

(-)- due to lack of reference dose, action level could not be calculated

**Attachment B Table 6**
**Soil Action Levels**
**Future Construction Worker**

| Chemical | Soil Action Level Noncancer Risk (mg/kg) | Soil Action Level Based on a Lifetime Cancer Risk | | |
|---|---|---|---|---|
| | | $1 \times 10^{-6}$ (mg/kg) | $1 \times 10^{-5}$ (mg/kg) | $1 \times 10^{-4}$ (mg/kg) |
| **Metals** | | | | |
| Arsenic | 3.17E+02 | 3.80E+03 | 3.80E+02 | 3.80E+01 |
| Lead | - | na | na | na |
| **Semivolatile organic chemicals** | | | | |
| Benz(a)anthracene | - | 5.84E+03 | 5.84E+02 | 5.84E+01 |
| Benzo(a)pyrene | - | 5.84E+02 | 5.84E+01 | 5.84E+00 |
| Benzo(b or k) fluoranthene | - | 5.84E+03 | 5.84E+02 | 5.84E+01 |
| **Pesticides/PCBs** | | | | |
| Aldrin | 1.83E+01 | 2.46E+02 | 2.46E+01 | 2.46E+00 |
| BHC-alpha | - | 7.09E+02 | 7.09E+01 | 7.09E+00 |
| BHC-beta | - | 2.48E+03 | 2.48E+02 | 2.48E+01 |
| BHC-delta | - | na | na | na |
| BHC-gamma | 1.95E+03 | 3.50E+03 | 3.50E+02 | 3.50E+01 |
| Chlordane-alpha | 3.65E+01 | 3.22E+03 | 3.22E+02 | 3.22E+01 |
| Chlordane-gamma | 3.65E+01 | 3.22E+03 | 3.22E+02 | 3.22E+01 |
| DDD | - | 1.78E+04 | 1.78E+03 | 1.78E+02 |
| DDE | - | 1.25E+04 | 1.25E+03 | 1.25E+02 |
| DDT | 3.04E+02 | 1.23E+04 | 1.23E+03 | 1.23E+02 |
| Dieldrin | 3.04E+01 | 2.62E+02 | 2.62E+01 | 2.62E+00 |
| Endosulfan I | 3.79E+03 | na | na | na |
| Endosulfan II | 3.79E+03 | na | na | na |
| Endrin ketone | - | na | na | na |
| Heptachlor | 3.25E+02 | 9.92E+02 | 9.92E+01 | 9.92E+00 |
| Heptachlor epoxide | 8.45E+00 | 4.91E+02 | 4.91E+01 | 4.91E+00 |
| Methoxychlor | 3.25E+03 | na | na | na |
| PCB 1254 | 3.25E+01 | 5.91E+02 | 5.91E+01 | 5.91E+00 |
| Toxaphene | - | 3.81E+03 | 3.81E+02 | 3.81E+01 |

na-not applicable (not a potential carcinogen)

(-)- due to lack of reference dose, action level could not be calculated

**Attachment B Table 7**
**Soil Action Levels**
**Future Institutional Worker**

| Chemical | Soil Action Level Noncancer Risk (mg/kg) | Soil Action Level Based on a Lifetime Cancer Risk | | |
|---|---|---|---|---|
| | | $1 \times 10^{-6}$ (mg/kg) | $1 \times 10^{-5}$ (mg/kg) | $1 \times 10^{-4}$ (mg/kg) |
| **Metals** | | | | |
| Arsenic | 1.78E+03 | 1.10E+03 | 1.10E+02 | 1.10E+01 |
| Lead | See Section 5 | #DIV/0! | #DIV/0! | #DIV/0! |
| | | 0.00E+00 | | |
| **Semivolatile organic chemicals** | | | | |
| Benz(a)anthracene | - | 7.29E+02 | 7.29E+01 | 7.29E+00 |
| Benzo(a)pyrene | - | 7.29E+01 | 7.29E+00 | 7.29E-01 |
| Benzo(b or k) fluoranthene | - | 7.29E+02 | 7.29E+01 | 7.29E+00 |
| **Pesticides/PCBs** | | 0.00E+00 | | |
| Aldrin | 5.70E+01 | 3.13E+01 | 3.13E+00 | 3.13E-01 |
| BHC-alpha | - | 9.77E+01 | 9.77E+00 | 9.77E-01 |
| BHC-beta | - | 3.42E+02 | 3.42E+01 | 3.42E+00 |
| BHC-delta | - | na | na | na |
| BHC-gamma | 6.59E+02 | 4.73E+02 | 4.73E+01 | 4.73E+00 |
| Chlordane-alpha | 1.14E+02 | 4.09E+02 | 4.09E+01 | 4.09E+00 |
| Chlordane-gamma | 1.14E+02 | 4.09E+02 | 4.09E+01 | 4.09E+00 |
| DDD | - | 2.22E+03 | 2.22E+02 | 2.22E+01 |
| DDE | - | 1.57E+03 | 1.57E+02 | 1.57E+01 |
| DDT | 9.51E+02 | 1.57E+03 | 1.57E+02 | 1.57E+01 |
| Dieldrin | 9.51E+01 | 3.33E+01 | 3.33E+00 | 3.33E-01 |
| Endosulfan I | 1.23E+04 | na | na | na |
| Endosulfan II | 1.23E+04 | na | na | na |
| Endrin ketone | - | na | na | na |
| Heptachlor | 1.10E+03 | 1.37E+02 | 1.37E+01 | 1.37E+00 |
| Heptachlor epoxide | 2.86E+01 | 6.76E+01 | 6.76E+00 | 6.76E-01 |
| Methoxychlor | 1.10E+04 | na | na | na |
| PCB 1254 | 4.40E+01 | 7.99E+01 | 7.99E+00 | 7.99E-01 |
| Toxaphene | - | 4.84E+02 | 4.84E+01 | 4.84E+00 |

na-not applicable (not a potential carcinogen)

(-)- due to lack of reference dose, action level could not be calculated

# FINAL
# APPENDIX B

## SOIL DATA

## OPERABLE UNIT #2

July 5, 1995

# Appendix B Soil Data
## Metals (concentrations in mg/kg)

| Station ID | 013-SLA | 013-SLB | 014-SLA | 014-SLB | 016-SLA | 023-SLA | 023-SLB | 026-SLA |
|---|---|---|---|---|---|---|---|---|
| Location | | | | | | | | |
| Depth (feet) | | | | | | | | |
| Other Description | 328 MLK | 328 MLK | 400 MLK | 400 MLK | 327 MLK | 216 Oak | 216 Oak | 323 Oak |
| | | | | | | | | |
| Arsenic | 59 | 24 | 32 | 27 | 33 | 29 | 180 | 36 |
| Barium | 110 | 70 | 60 | 55 | 35 | 64 | 87 | 39 |
| Beryllium | 0.65 | 0.55 | 0.65 | 0.61 | 0.53 | 0.67 | 0.66 | 0.22 |
| Cadmium | <0.84 | <0.83 | <0.84 | <0.85 | <0.83 | <0.84 | <0.83 | 0.7 |
| Chromium | 17 | 12 | 15 | 13 | 11 | 14 | 15 | 13 |
| Cobalt | <1.8 | 1.6 | <1.5 | 2 | <1.5 | <1.5 | 2.1 | 1.7 |
| Copper | 19 | 19 | 19 | 19 | 14 | 21 | 20 | 7.4 |
| Lead | 180 | 150 | 280 | 170 | 100 | 150 | 110 | 340 |
| Manganese | 270 | 140 | 190 | 230 | 120 | 150 | 150 | 120 |
| Mercury | 0.32 | <0.10 | 0.32 | 0.28 | <0.10 | <0.10 | <0.10 | <0.10 |
| Nickel | 4.5 | 4.1 | 4.5 | 4.2 | <4 | 6.6 | 5.4 | 3.8 |
| Vanadium | 22 | 14 | 19 | 19 | 16 | 23 | 20 | 10 |
| Zinc | 310 | 50 | 68 | 95 | 72 | 130 | 150 | 130 |

# Appendix B Soil Data
## Metals (concentrations in mg/kg)

| Station ID | 026-SLB | 027-SLA | 027-SLB | 028-SLA | 028-SLB | 029-SLA | 029-SLB | 032-SLA |
|---|---|---|---|---|---|---|---|---|
| Location | | | | | | | | |
| Depth (feet) | | | | | | | | |
| Other Description | 323 Oak | 319 MLK | 319 MLK | 315 MLK | 315 MLK | | | 201 Oakland Hts |
| | | | | | | | | |
| Arsenic | 41 | 41 | 32 | 110 | 36 | 110 | 37 | 23 |
| Barium | 69 | 70 | 140 | 63 | 49 | 62 | 61 | 51 |
| Beryllium | 0.3 | 0.29 | 0.27 | 0.33 | 0.18 | 0.31 | 0.25 | 0.22 |
| Cadmium | <0.61 | <1 | <0.59 | <0.58 | <0.52 | 0.66 | <0.50 | <0.44 |
| Chromium | 12 | 18 | 14 | 15 | 9.1 | 17 | 9 | 12 |
| Cobalt | 2.2 | 2.8 | 2.5 | 2.1 | 1.9 | 2.2 | 2.3 | 1.6 |
| Copper | 8.1 | 11 | 20 | 8.9 | 52 | 12 | 11 | 4.5 |
| Lead | 190 | 240 | 210 | 230 | 210 | 330 | 160 | 94 |
| Manganese | 170 | 170 | 220 | 170 | 140 | 130 | 140 | 120 |
| Mercury | <0.10 | <0.10 | 0.21 | <0.10 | <0.10 | 0.14 | 0.14 | 0.21 |
| Nickel | 4.2 | 5.9 | 2.2 | 4.3 | 3 | 4.3 | 6.4 | 2 |
| Vanadium | 17 | 18 | 14 | 18 | 9.1 | 19 | 9.2 | 19 |
| Zinc | 110 | 150 | 260 | 140 | 120 | 180 | 130 | 84 |

Appendix B Soil Data
Metals (concentrations in mg/kg)

| Station ID | 032-SLB | 032-SLC | 041-SLA | 041-SLB | 042-SLA | 042-SLB | 043-SLA | 043-SLB |
|---|---|---|---|---|---|---|---|---|
| Location | | | | | | | | |
| Depth (feet) | | | | | | | | |
| Other Description | 201 Oakland Hts | 201 Oakland Hts | 202 Oak | 202 Oak | 204 Oak | 204 Oak | 321 MLK | 321 MLK |
| | | | | | | | | |
| Arsenic | 33 | 36 | 20 | 45 | 23 | 60 | 38 | 41 |
| Barium | 170 | 160 | 60 | 65 | 67 | 140 | 64 | 75 |
| Beryllium | 0.43 | 0.36 | 0.24 | 0.29 | <0.87 | <0.88 | <0.87 | <0.87 |
| Cadmium | 1.1 | <1 | <0.54 | <0.59 | <0.99 | <1 | <1 | <1 |
| Chromium | 20 | 17 | 24 | 14 | 14 | 16 | 14 | 14 |
| Cobalt | 3.1 | 3.5 | 2 | 2.6 | 1.6 | 2.7 | 1.6 | 2.5 |
| Copper | 40 | 17 | 13 | 11 | 18 | 15 | 13 | 11 |
| Lead | 570 | 480 | 120 | 200 | 140 | 130 | 290 | 150 |
| Manganese | 150 | 200 | 270 | 220 | 140 | 210 | 180 | 200 |
| Mercury | 0.22 | 0.19 | 0.24 | 0.36 | 0.13 | 0.29 | <0.10 | 0.13 |
| Nickel | 2.9 | 4.8 | 2 | 2.8 | <7.6 | <7.6 | <7.6 | <7.6 |
| Vanadium | 26 | 23 | 22 | 23 | 15 | 17 | 16 | 18 |
| Zinc | 250 | 180 | 63 | 98 | 99 | 220 | 190 | 160 |

Appendix B Soil Data
Metals (concentrations in mg/kg)

| Station ID | 044-SLA | 044-SLB | 045-SLA | 045-SLB | A09-SLA | A09-SLB | A10-SLA | A10-SLB |
|---|---|---|---|---|---|---|---|---|
| Location | | | | | | | | |
| Depth (feet) | | | | | | | | |
| Other Description | 311 MLK | 311 MLK | 305 MLK | 305 MLK | 307 MLK | 307 MLK | 309 MLK | 309 MLK |
| | | | | | | | | |
| Arsenic | 73 | 37 | 68 | 42 | 33 | 62 | 21 | 42 |
| Barium | 100 | 77 | 76 | 61 | 59 | 91 | 53 | 36 |
| Beryllium | <0.88 | <0.89 | <0.87 | <0.88 | <0.25 | <1 | <0.22 | <0.22 |
| Cadmium | <1 | 1.1 | <1 | <1 | <0.75 | <1 | <0.65 | <0.65 |
| Chromium | 21 | 14 | 160 | 17 | 18 | 22 | 11 | 13 |
| Cobalt | 2.8 | 1.9 | 3.1 | <1.5 | <3 | <3 | <2 | <2 |
| Copper | 27 | 17 | 16 | 7.7 | 14 | 12 | 13 | 12 |
| Lead | 420 | 160 | 330 | 93 | 360 | 210 | 270 | 60 |
| Manganese | 150 | 150 | 170 | 610 | 150 | 150 | 81 | 95 |
| Mercury | 0.17 | <0.11 | 0.15 | <0.1 | 0.37 | 0.4 | <0.10 | <0.10 |
| Nickel | <7.6 | <7.7 | 8.1 | <7.7 | 3.6 | 5.8 | <1.7 | 3.5 |
| Vanadium | 22 | 17 | 40 | 24 | <20 | 32 | 12 | 19 |
| Zinc | 250 | 220 | 210 | 150 | 270 | 230 | 91 | 96 |

# Appendix B Soil Data
## Metals (concentrations in mg/kg)

| Station ID | A33-SLA | A34-SLA | A35-SLA | WC-137-SLA | WC-137-SLB | WC-SS4(0-1) | WC-SS5(0-1) | WC-SS8(0-1) |
|---|---|---|---|---|---|---|---|---|
| Location | | | | | | | | |
| Depth (feet) | | | | | | Surface | Surface | Surface |
| Other Description | lot N of RR | lot N of RR | lot N of RR | 317 MLK | 317 MLK | Flour Mill | Flour Mill | Flour Mill |
| | | | | | | | | |
| Arsenic | 24 | 58 | 24 | 74 | 30 | <1.9 | <1.9 | 2.3 |
| Barium | 120 | 120 | 82 | 77 | 65 | | | |
| Beryllium | <1 | <1 | <1 | <0.24 | <0.23 | | | |
| Cadmium | <0.62 | 0.91 | 0.91 | <0.96 | <0.94 | <0.64 | <0.62 | <0.64 |
| Chromium | 9.4 | 20 | 7.5 | 19 | 12 | | | |
| Cobalt | 3.2 | 4 | 2.6 | <1.7 | 1.8 | | | |
| Copper | 27 | 33 | 130 | 13 | 41 | | | |
| Lead | 82 | 170 | 160 | 250 | 170 | 2.6 | 2.4 | 2.7 |
| Manganese | 160 | 560 | 200 | 200 | 220 | | | |
| Mercury | 0.21 | 0.24 | 0.22 | <0.12 | <0.12 | | | |
| Nickel | 7 | 9.2 | 7.6 | <4.6 | 5 | | | |
| Vanadium | 22 | 40 | 9.5 | 20 | 14 | | | |
| Zinc | 100 | 420 | 610 | 160 | 140 | | | |

# Appendix B Soil Data
## Metals (concentrations in mg/kg)

| Station ID | WC-SS9(0-1) | WC-SS36 | WRID60SS | WRID63SS | WRID70SS | WRID7BFSS | WRID73SS |
|---|---|---|---|---|---|---|---|
| Location | | | | | | | |
| Depth (feet) | Surface | Surface | Surface | 3 | Surface | Surface (below backfill) | 3 |
| Other Description | Flour Mill | Holcomb Tire | Holcomb Tire | Holcomb Tire | Holcomb Tire | Holcomb Tire | Holcomb Tire |
| | | | | | | | |
| Arsenic | 2.4 | 62.1 | | | <2 | 18 | 7.1 |
| Barium | | | 49.5 | <8.8 | <3.4 | 53.7 | 49.7 |
| Beryllium | | | <0.24 | <0.25 | <0.22 | <0.21 | <0.3 |
| Cadmium | <0.64 | | <0.96 | <0.99 | <0.9 | <0.83 | <0.88 |
| Chromium | | | 26.7 | 52.9 | 7.4 | 9 | 40.6 |
| Cobalt | | | <1.2 | <1.2 | <1.1 | <6 | <1.7 |
| Copper | | | 10 | <6.1 | <3 | 13.3 | 9.2 |
| Lead | 3.6 | | | | 3.7 | 33.4 | 19.7 |
| Manganese | | | | | 5.8 | 283 | 101 |
| Mercury | | | 0.12 | <0.12 | <0.11 | <0.1 | <0.11 |
| Nickel | | | <4.9 | <1.7 | <1.6 | <5.4 | 10.3 |
| Vanadium | | | 56 | 106 | 30.9 | 28.4 | 85.2 |
| Zinc | | | 162 | 22.1 | 4.7 | 55.6 | 20.5 |

# Appendix B Soil Data

## Semivolatile Organic Chemicals, Pesticides, and PCBs (concentrations in µg/kg)

| Station ID | 013-SLP | 014-SLP | 016-SLP | 023-SLP | 026-SLP | 027-SLP | 028-SLP | 029-SLP | 032-SLP | 041-SLP | 042-SLP | 043-SLP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | | | | | | | | | | | | |
| Depth (feet) | | | | | | | | | | | | |
| Other Description | 328 MLK | 400 MLK | 327 MLK | 216 Oak | 323 MLK | 319 MLK | 315 MLK | 313 MLK | 201 Oakland Hts | 202 Oak | 204 Oak | 321 MLK |
| | | | | | | | | | | | | |
| Acenaphthylene | <340 | <350 | <340 | <340 | <340 | 78 | 110 | <340 | <350 | <350 | <340 | <340 |
| Anthracene | <340 | <350 | <340 | <340 | <340 | 36 | 94 | 56 | <350 | <350 | <340 | <340 |
| Benzo(a)anthracene | 93 | <350 | 39 | <340 | 69 | 270 | 1200 | 150 | 210 | <350 | <340 | 73 |
| Benzo(a)pyrene | 93 | <350 | <340 | <340 | <340 | 420 | 1300 | 120 | 170 | <350 | <340 | 79 |
| Benzo(b and/or k)fluoranthene | 110 | <350 | <340 | <340 | 140 | 720 | 1500 | 150 | 280 | <350 | <340 | <340 |
| Benzo(g,h,i)perylene | <340 | <350 | <340 | <340 | <340 | 460 | 730 | <340 | 210 | <350 | <340 | <340 |
| Benzoic acid | | | | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | <340 | <350 | <340 | <340 | <340 | <350 | <340 | <340 | <350 | <350 | <340 | <340 |
| Carbazole | <340 | <350 | <340 | <340 | <340 | <350 | 38 | <340 | <350 | <350 | <340 | <340 |
| Chrysene | 130 | <350 | 69 | <340 | 100 | 340 | 1400 | 180 | 290 | 90 | <340 | 120 |
| Dibenzofuran | 51 | <350 | <340 | <340 | <340 | 81 | <340 | <340 | <350 | <350 | <340 | <340 |
| Fluoranthene | 190 | 52 | 98 | 45 | 80 | 230 | 1200 | 300 | 230 | 150 | 88 | 110 |
| Indeno(1,2,3-c,d)pyrene | <340 | <350 | <340 | <340 | <340 | 330 | 800 | <340 | 190 | <350 | <340 | <340 |
| Methylnaphthalene (2-) | 97 | <350 | <340 | 130 | 59 | 200 | 100 | 94 | 130 | <350 | 63 | <340 |
| Naphthalene | 120 | <350 | <340 | 91 | 38 | 200 | 73 | 64 | 81 | <350 | 45 | 84 |
| Phenanthrene | 180 | <350 | 54 | 66 | 59 | 290 | 240 | 310 | 120 | 160 | 74 | 80 |
| Pyrene | 220 | 77 | 110 | 65 | <340 | 340 | 1700 | 310 | <390 | 280 | 90 | <340 |
| | | | | | | | | | | | | |
| **Pesticides** | | | | | | | | | | | | |
| Aldrin | <1.8 | <1.8 | <1.8 | <1.8 | <1.7 | <1.8 | <20 | <1.8 | <1.8 | <1.8 | 22 | <1.8 |
| BHC-alpha | <1.8 | <1.8 | 3.1 | <1.8 | <1.7 | 2.1 | <1.8 | 8.9 | <1.8 | <1.8 | 5 | <1.8 |
| BHC-beta | 5.9 | <1.8 | 51 | <3 | 5.5 | 12 | 6.7 | 330 | <1.8 | <1.8 | 16 | <8 |
| BHC-delta | <1.8 | 2.1 | <7 | <1.8 | <1.7 | <1.8 | <1.8 | 130 | <1.8 | <1.8 | <6 | 9 |
| BHC-gamma | <1.8 | <1.8 | 6 | <1.8 | <1.7 | <1.8 | <1.8 | 43 | <1.8 | <1.8 | 2.5 | <1.8 |
| Chlordane-alpha | <20 | <20 | 500 | <20 | 24 | 68 | <30 | 470 | 60 | <1.8 | <1.8 | 460 |
| Chlordane-gamma | 15 | 13 | 300 | 11 | 28 | 61 | <30 | 1300 | 56 | <1.8 | <30 | <300 |
| DDD | | | | | | | | | | | | |
| DDE | 790 | 510 | 950 | 250 | 280 | 960 | 880 | 1100 | 490 | 260 | 5600 | 1500 |
| DDT | 590 | 230 | 1000 | 290 | 650 | 1200 | 870 | 4500 | 350 | 65 | 3400 | 1200 |
| Dieldrin | <30 | <50 | 110 | 31 | 84 | 52 | 330 | 950 | 170 | 13 | 1500 | 170 |
| Endosulfan I | <1.8 | <1.8 | <20 | <1.8 | <1.7 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 | <1.8 |
| Endosulfan II | <6 | <20 | <30 | <3.4 | <3.4 | <3.5 | <20 | <3.4 | <9 | 12 | <60 | <3.4 |
| Endrin Ketone | <20 | <9 | <20 | <3.4 | <3.4 | <3.5 | <3.4 | <3.4 | <3.5 | <3.5 | 32 | <70 |
| Heptachlor | <2 | 3.3 | <3 | <1.8 | 4.3 | <3 | <1.8 | 20 | <1.8 | <1.8 | <1.8 | <6 |
| Heptachlor Epoxide | <6 | <20 | 94 | <5 | <20 | <30 | <20 | 1000 | <20 | <1.8 | <1.8 | 35 |
| Methoxychlor | 44 | <50 | <70 | <18 | <30 | <50 | <18 | <140 | <18 | <18 | <30 | <60 |
| PCB-1254 | <34 | <35 | <34 | <34 | <34 | <35 | 460 | <34 | <35 | <35 | <34 | <34 |
| Toxaphene | <640 | 670 | 2000 | 480 | 480 | 770 | <180 | 3400 | <180 | <180 | <180 | <180 |

# Appendix B Soil Data
## Semivolatile Organic Chemicals, Pesticides, and PCBs (concentrations in µg/kg)

| Station ID | 044-SLP | 045-SLP | WC-137-SLP | A09-SLA | A09-SLB | A10-SLA | A10-SLB | A33-SLA | A34-SLA | A35-SLA |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | | | | | | | | | | |
| Depth (feet) | | | | | | | | | | |
| Other Description | 311 MLK | 305 MLK | 317 MLK | 307 MLK | 307 MLK | 309 MLK | 309 MLK | lot N of railroad | lot N of railroad | lot N of railroad |
| | | | | | | | | | | |
| Acenaphthylene | <350 | <350 | | <350 | <8900 | <360 | <450 | <370 | <390 | <370 |
| Anthracene | <350 | <350 | | <350 | <8900 | <360 | <450 | <370 | <390 | 39 |
| Benzo(a)anthracene | 65 | 190 | | 74 | <8900 | <360 | <450 | <370 | <390 | <370 |
| Benzo(a)pyrene | <350 | <350 | | 89 | <8900 | <360 | <450 | 83 | 180 | 130 |
| Benzo(b and/or k)fluoranthene | <350 | <350 | | 240 | <8900 | <360 | <450 | 180 | 420 | 420 |
| Benzo(g,h,i)perylene | <350 | <350 | | 68 | <8900 | <360 | <450 | 55 | 93 | <370 |
| Benzoic acid | | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | <350 | <350 | | <350 | <8900 | <360 | <450 | <370 | <390 | <370 |
| Carbazole | <350 | <350 | | <350 | <8900 | <360 | <450 | <370 | <390 | <370 |
| Chrysene | 100 | <350 | | 100 | <8900 | <360 | <450 | 160 | 280 | 270 |
| Dibenzofuran | <350 | <350 | | <350 | <8900 | <360 | <450 | <370 | <390 | <370 |
| Fluoranthene | 110 | 150 | | 140 | <8900 | <360 | <450 | 160 | 300 | 270 |
| Indeno(1,2,3-c,d)pyrene | <350 | <350 | | 59 | <8900 | <360 | <450 | <370 | 110 | 73 |
| Methylnaphthalene (2-) | <350 | <350 | | 62 | <8900 | <360 | <450 | 1200 | 460 | 370 |
| Naphthalene | 48 | 43 | | 43 | <8900 | <360 | <450 | 880 | 310 | 280 |
| Phenanthrene | 62 | 79 | | 52 | <8900 | <360 | <450 | 520 | 320 | 310 |
| Pyrene | <350 | <350 | | 150 | <8900 | <360 | <450 | <370 | <390 | <370 |
| | | | | | | | | | | |
| **Pesticides** | | | | | | | | | | |
| Aldrin | <1.8 | <1.8 | <20 | <23 | <4.6 | <3.7 | <4.7 | 3.5 | <2 | <1.9 |
| BHC-alpha | 2.5 | <1.8 | <20 | <23 | <4.6 | <3.7 | <4.7 | <1.9 | <2 | <1.9 |
| BHC-beta | 11 | 6.2 | <20 | <23 | <4.6 | <3.7 | <4.7 | <1.9 | <2 | <1.9 |
| BHC-delta | <10 | <3 | <20 | <23 | <4.6 | <3.7 | <4.7 | <1.9 | <2 | <1.9 |
| BHC-gamma | <2 | <1.8 | <20 | <23 | <4.6 | <3.7 | <4.7 | <1.9 | <2 | <1.9 |
| Chlordane-alpha | 590 | <40 | <30 | <2300 | 5.8 | <3.7 | 39 | <1.9 | 360 | <1.9 |
| Chlordane-gamma | 1600 | <40 | <20 | <23 | <4.6 | <3.7 | 24 | <1.9 | 1100 | <1.9 |
| DDD | | | | | | | | | | |
| DDE | 1300 | 1200 | 570 | 620 | 79 | 84 | 23 | <5 | 170 | 240 |
| DDT | 1800 | 1100 | 380 | 680 | 69 | 23 | 18 | 3.1 | 310 | 160 |
| Dieldrin | 960 | 74 | <39 | <44 | <8.9 | <7.2 | <9 | <6 | 56 | 46 |
| Endosulfan I | <1.8 | <1.8 | 160 | <23 | <4.6 | <3.7 | <4.7 | <1.9 | <2 | <1.9 |
| Endosulfan II | <3.5 | 100 | <39 | <44 | <20 | <7.2 | <9 | <3.8 | <3.9 | <3.7 |
| Endrin Ketone | <70 | 100 | <39 | <44 | <8.9 | <7.2 | <9 | 2.8 | <3.9 | <3.7 |
| Heptachlor | 11 | <3 | <20 | <23 | <4.6 | <3.7 | <4.7 | 18 | 100 | 4.6 |
| Heptachlor Epoxide | 710 | 21 | <20 | <23 | <4.6 | <3.7 | <8 | <1.9 | 130 | <1.9 |
| Methoxychlor | <80 | 53 | <200 | <230 | <46 | <37 | <47 | <19 | <20 | <19 |
| PCB-1254 | <35 | <34 | 230 | <440 | <89 | <72 | <90 | <38 | <39 | <37 |
| Toxaphene | <180 | <180 | <2000 | <440 | <460 | <370 | <470 | <190 | <200 | <190 |

# Appendix B Soil Data
## Semivolatile Organic Chemicals, Pesticides, and PCBs (concentrations in µg/kg)

| Station ID | WC-SS4(0-1) | WC-SS5(0-1) | WC-SS8(0-1) | WC-SS9(0-1) | WC-SS36 | WRID60SS | WRID63SS | WRID70SS | WRID73SS |
|---|---|---|---|---|---|---|---|---|---|
| Location | | | | | | D6 | D6 | D7 | D7 |
| Depth (feet) | Surface | Surface | Surface | Surface | Surface | Surface | 3 | Surface | 3 |
| Other Description | Flour Mill | Flour Mill | Flour Mill | Flour Mill | Holcomb Tire | Holcomb Tire | Holcomb Tire | Holcomb Tire | Holcomb Tire |
| | | | | | | | | | |
| Acenaphthylene | | | | | | <400 | <410 | <360 | <360 |
| Anthracene | | | | | | <400 | <410 | <360 | <360 |
| Benzo(a)anthracene | | | | | | <400 | <410 | <360 | <360 |
| Benzo(a)pyrene | | | | | | <400 | <410 | <360 | <360 |
| Benzo(b and/or k)fluoranthene | | | | | | 63 | <410 | <360 | <360 |
| Benzo(g,h,i)perylene | | | | | | <400 | <410 | <360 | <360 |
| Benzoic acid | | | | | | 120 | <2000 | <1800 | <1800 |
| Bis(2-ethylhexyl)phthalate | | | | | | 70 | <410 | <360 | 43 |
| Carbazole | | | | | | <400 | <410 | <360 | <360 |
| Chrysene | | | | | | <400 | <410 | <360 | <360 |
| Dibenzofuran | | | | | | <400 | <410 | <360 | <360 |
| Fluoranthene | | | | | | <400 | <410 | <360 | <360 |
| Indeno(1,2,3-c,d)pyrene | | | | | | <400 | <410 | <360 | <360 |
| Methylnaphthalene (2-) | | | | | | <400 | <410 | <360 | <360 |
| Naphthalene | | | | | | <400 | <410 | <360 | <360 |
| Phenanthrene | | | | | | <400 | <410 | <360 | <360 |
| Pyrene | | | | | | <400 | <410 | <360 | <360 |
| | | | | | | | | | |
| **Pesticides** | | | | | | | | | |
| Aldrin | | | | | | <9.6 | <9.7 | <8.8 | <8.8 |
| BHC-alpha | | | | | | <9.6 | <9.7 | <8.8 | <8.8 |
| BHC-beta | | | | | | <9.6 | 50 | <8.8 | <8.8 |
| BHC-delta | | | | | | <9.6 | <9.7 | <8.8 | <8.8 |
| BHC-gamma | | | | | | <9.6 | <9.7 | <8.8 | <8.8 |
| Chlordane-alpha | | | | | | <96 | <97 | <88 | <88 |
| Chlordane-gamma | | | | | | <96 | <97 | <88 | <88 |
| DDD | | | | | | 58 | | 23 | <18 |
| DDE | | | | | | 93 | 130 | <18 | <18 |
| DDT | | | | | | 190 | 240 | 240 | 47 |
| Dieldrin | | | | | | <19 | <19 | <18 | <18 |
| Endosulfan I | | | | | | <9.6 | <9.7 | <8.8 | <8.8 |
| Endosulfan II | | | | | | <19 | <19 | <18 | <18 |
| Endrin Ketone | | | | | | <19 | <19 | <18 | <18 |
| Heptachlor | | | | | | <9.6 | <9.7 | <8.8 | <8.8 |
| Heptachlor Epoxide | | | | | | <9.6 | <9.7 | <8.8 | <8.8 |
| Methoxychlor | | | | | | <96 | <97 | <88 | <88 |
| PCB-1254 | | | | | | <190 | <190 | <180 | <180 |
| Toxaphene | | | | | | 520 | 650 | 510 | <180 |

# Appendix B Soil Data

Semivolatile Organic Chemicals, Pesticides, and PCBs (concentrations in µg/kg)

| Station ID | WRID7BFSS |
|---|---|
| Location | D7 |
| Depth (feet) | Surface (below backfill) |
| Other Description | Holcomb Tire |
| | |
| Acenaphthylene | <340 |
| Anthracene | <340 |
| Benzo(a)anthracene | <340 |
| Benzo(a)pyrene | <340 |
| Benzo(b and/or k)fluoranthene | <340 |
| Benzo(g,h,i)perylene | <340 |
| Benzoic acid | <1600 |
| Bis(2-ethylhexyl)phthalate | 160 |
| Carbazole | <340 |
| Chrysene | <340 |
| Dibenzofuran | <340 |
| Fluoranthene | <340 |
| Indeno(1,2,3-c,d)pyrene | <340 |
| Methylnaphthalene (2-) | <340 |
| Naphthalene | <340 |
| Phenanthrene | <340 |
| Pyrene | <340 |
| | |
| **Pesticides** | |
| Aldrin | <8.2 |
| BHC-alpha | <8.2 |
| BHC-beta | <8.2 |
| BHC-delta | <8.2 |
| BHC-gamma | <8.2 |
| Chlordane-alpha | <82 |
| Chlordane-gamma | 120 |
| DDD | 27 |
| DDE | 42 |
| DDT | 140 |
| Dieldrin | 52 |
| Endosulfan I | <8.2 |
| Endosulfan II | <16 |
| Endrin Ketone | <16 |
| Heptachlor | 14 |
| Heptachlor Epoxide | 15 |
| Methoxychlor | <82 |
| PCB-1254 | <160 |
| Toxaphene | 1200 |

BLACK & VEATCH Waste Science, Inc.

400 Northridge Road, Suite 350, Atlanta, Georgia 30350, (404) 594-2500, Fax: (404) 587-2930

US EPA -- Region IV
Site Inspections
Work Assignment No. 12

BVWS Project 52012.429
September 9, 1994

NRCO
9/19/1994

Mr. Narindar Kumar
Chief, Site Assessment Section
U.S. Environmental Protection Agency
345 Courtland Street, NE
Atlanta, Georgia 30365

Subject: Final Site Inspection Prioritization
Woolfolk Chemical
Lenox, Cook County, Georgia
EPA ID No. GAD082832841

Dear Mr. Kumar:

Enclosed please find one copy of the Final Site Inspection Prioritization for Woolfolk Chemical in Lenox, Cook County, Georgia. If you have any questions, please contact me at 404/643-2320.

Very truly yours,

BLACK & VEATCH Waste Science, Inc.

Victor Blix
Project Manager

RECD
SEP 12 1994

ss
Enclosure

cc: Doug Thompson, EPA PO, w/o enclosures
Deborah Davidson, EPA CO, w/o enclosures
Earl Bozeman, EPA WAM, w/o enclosures

BLACK & VEATCH Waste Science, Inc.

2300 Clayton Road, Suite 220, Concord, California 94520-2100, (510) 246-8010, Fax: (510) 246-8082

U.S. Environmental Protection Agency
Woolfolk Chemical - Lenox Warehouse
Work Assignment 12

BVWS Project 52012.429
BVWS File SA
August 16, 1994

RECEIVED
SEP 12 1994
WPB-GAC

Mr. Narindar Kumar
Chief, Site Assessment Section
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Subject: Site Inspection Prioritization
Woolfolk Chemical
Lenox, Cook County, Georgia
EPA ID No. GAD082832841

Dear Mr. Kumar:

BLACK & VEATCH Waste Science, Inc. has been tasked by the U.S. Environmental Protection Agency (EPA), to conduct a Site Inspection Prioritization at the Woolfolk Chemicals - Lenox Warehouse (Woolfolk) Site in Lenox, Georgia. According to the Scope of Work, a preliminary Hazard Ranking System (HRS) score was prepared to determine future activities at the site.

The Woolfolk site is located on a 1 1/2 acre tract of land situated at the intersection of Rentz Avenue and East Colquitt Street in the city of Lenox, Georgia. The site is currently owned by Mr. Bob Lindsey. From 1976 to 1981, Woolfolk Chemical leased the warehouse from Mr. Lindsey, and used the facility as a distribution and storage center for a wide variety of herbicide and pesticide products (Ref. 1).

On July 1, 1981, a fire gutted the facility. Water used to fight the fire became contaminated when toxaphene and chlordane stored inside the warehouse began to leak. The contaminated water was observed spilling onto the surrounding soil and into a municipal drainage ditch located approximately 30 feet to the south of the warehouse. On July 31, 1981, approximately 200 cubic yards of residual

material from the Woolfolk Warehouse fire were collected and shipped to a hazardous waste diposal facility. In addition, firefighting waters that remained in the warehouse were treated with activated carbon to remove excessive amounts of toxaphene (Ref. 1).

In March 1985, Mr. Lindsey reported to EPA Region IV that a strong odor existed in the building and requested EPA personnel to investigate (Ref. 2). On August 8, 1984, members of the Georgia Environmental Protection Division (GEPD) Remedial Action Unit collected surface soil samples from the front and rear entrances of the warehouse. An additional sample was collected from a crack in the floor of the building where pesticide residue had accumulated. Analysis of the samples revealed high levels of toxaphene in the soil (up to 6,062 milligrams per kilogram) (Ref. 1). A Site Investigation Report was completed by the Georgia Environmental Protection Division (GEPD) in February, 1985 (Ref. 1). The report recommended further assessment of the site in order to evaluate the migration potential of onsite contaminants (Ref. 1). To date, no remedial action has been taken to remove excess toxaphene from the soil surrounding the warehouse or the drainage ditch (Refs. 1, 2).

A preliminary HRS score for the Woolfolk site was calculated using the Site Inspection worksheets. Pathways evaluated include groundwater, surface water, soil exposure, and air.

The groundwater pathway score is based on a potential release from contaminated soil. The groundwater pathway score is low due to the lack of targets and the depth of the aquifer. The 891 residents of the City of Lenox receive their drinking water from two municipal wells, both located approximately 1/2 mile north of the Woolfolk site (Refs. 1, 3). The wells, owned and operated by the City of Lenox, draw water from the principal artesian aquifer situated in the Ocala Limestone. The Ocala Limestone is approximately 173 feet thick underneath the site and is typically found beginning at 350 feet below land surface (bls). The permeability of overlying strata is moderatly slow (Ref. 1).

The surface water pathway score is based on a potential release to Brushy Creek, the nearest surface water body to the site (Ref. 4). The site is flat, and poorly drained. During the fire, water was observed flowing into a municipal drainage ditch located along East Colquitt Street (Ref. 1). The ditch drains to the southeast, but its exact pathway and terminus are unknown. In the absence of this data, a probable point of entry (PPE) was established using U.S. Geological

Survey topographic maps (Ref. 4). The PPE is located 3,500 feet to the southeast of the site at Brushy Creek (Ref. 4). Brushy Creek flows to the south, eventually converging with the New River approximately 14 miles downstream of the PPE (Ref. 4). The alluvial floodplains of the New River are habitats for the American alligator (*Alligator americana*) and the Indigo snake (*Drymarchon corais couperi*), both federally designated endangered species (Refs. 1, 7). The surface water pathway contains no drinking water inlets or commercial fisheries within the 15-mile target distance limit (Refs. 5, 6). Recreational activity and sport fishing along the surface water pathway is minimal (Ref. 5). No wetlands are associated with the surface water pathway (Refs. 1, 4, 7).

The Woolfolk site is located in a low density residential area (Refs. 1, 4). There are approximatey 891 residents within a 4-mile radius of the site (Ref. 3). The nearest residence is approximately 200 feet to the south of the warehouse, on the opposite side of East Colquitt Street (Refs. 1, 4). The soil exposure pathway was scored based on an observed release to surficial soils, with no onsite workers or resident populations (Refs. 1, 2). Access to the site is unlimited, and children have been observed playing at the site. The air pathway score was based on a potential release and a target value derived from nearby populations and two federally endangered species potentially inhabiting areas within a 4-mile radius of the site (Refs. 1, 2, 3, 4, 7).

**HRS SCORING SUMMARY**

| | | |
|---|---|---|
| Sgw | = | 0.16 |
| Ssw | = | 0.90 |
| Sso | = | 0.02 |
| Sa | = | 0.03 |
| **OVERALL SCORE** | **=** | **0.52** |

Due to low target values and pathway scores, no further action is recommended for the Woolfolk Chemical Warehouse.

Mr. Narindar Kumar

BVWS Projects 52012.429
August 16, 1994

Please find attached additional references collected during this investigation. If you have any comments or questions, please call me at (510) 246-8010, or Victor Blix at (404) 643-2320.

Sincerely,

BLACK & VEATCH Waste Science, Inc.

Jon Erskine
Project Geologist

jae
Enclosures

**REFERENCES**

1. Georgia Environmental Protection Division, Remedial Action Unit, Site Investigation Report, Woolfolk Chemical Works, Lenox, Georgia, February, 1985.

2. Susan Coker, Weston SPER, memorandum to Ron Dobbs, EPA Region IV, April 9, 1985. Subject: Woolfolk Chemical Site Monitoring.

3. U.S. Environmental Protection Agency, Graphical Exposure Modeling System (GEMS) Data Base. Compiled from U.S. Bureau of the Census data, 1983.

4. U.S. Geological Survey, 7.5 minute series Topographic Quadrangle Maps of Georgia: Lenox, GA, 1973, Adel, GA, 1973, Nashville West, GA, 1973; scale 1:24,000.

5. Dan Holder, Georgia Department of Natural Resources, Wildlife Division, Fisheries Management, telephone conversation with Jon Erskine, Black and Veatch Waste Science, Inc., May 5, 1994. Subject: Fisheries.

6. Buddy Guy, City of Adel, Water and Sewer Department, telephone conversation with Jon Erskine, Black and Veatch Waste Science, Inc., May 5, 1994. Subject: City of Adel municipal water.

7. Georgia Department of Natural Resources, Wildlife Resources Division, Georgia Natural Heritage Program Database, January 1994.

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# GROUND WATER MIGRATION PATHWAY SCORESHEET

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 1. Observed Release | 550 | 0 | |
| 2. Potential to Release | | | |
| 2a. Containment | 10 | 20 | |
| 2b. Net Precipitation | 10 | 6 | |
| 2c. Depth to Aquifer | 5 | 1 | |
| 2d. Travel Time | 35 | 15 | |
| 2e. Potential to Release [lines 2a x (2b + 2c + 2d)] | 500 | 220 | |
| 3. Liklihood of Release (higher of lines 1 and 2e) | 550 | | 220 |
| **Waste Characteristics** | | | |
| 4. Toxicity/Mobility | a | 10 | |
| 5. Hazardous Waste Quantity | a | 10 | |
| 6. Waste Characteristics | 100 | | 3 |
| **Targets** | | | |
| 7. Nearest Well | 50 | 18 | |
| 8. Population | | | |
| 8a. Level I Concentrations | b | 0 | |
| 8b. Level II Concentrations | b | 0 | |
| 8c. Potential Contamination | b | 32.4 | |
| 8d. Population (lines 8a + 8b + 8c) | b | 32.4 | |
| 9. Resources | 5 | 5 | |
| 10. Wellhead Protection Area | 20 | 0 | |
| 11. Targets (lines 7 + 8d + 9 + 10) | b | | 55.4 |
| **Ground Water Migration Score for an Aquifer** | | | |
| 12. Aquifer Score [(lines 3 x 6 x 11)/82,500][c] | 100 | | 0.4 |
| **Ground Water Migration Pathway Score** | | | |
| 13. Pathway Score ($S_{GW}$), (highest value from line 12 for all aquifers evaluated)[c] | 100 | | 0.4 |

[a] Maximum value applies to waste characteristics category

[b] Maximum value not applicable

[c] Do not round to nearest integer

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

## Drinking Water Threat

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 1. Observed Release | 550 | 0 | |
| 2. Potential to Release by Overland Flow | | | |
| 2a. Containment | 10 | 10 | |
| 2b. Runoff | 25 | 3 | |
| 2c. Distance to Surface Water | 25 | 6 | |
| 2d. Potential to Release by Overland Flow [lines 2a x (2b + 2c)] | 500 | 90 | |
| 3. Potential to Release by Flood | | | |
| 3a. Containment (Flood) | 10 | 10 | |
| 3b. Flood Frequency | 50 | 25 | |
| 3c. Potential to Release by Flood (lines 3a x 3b) | 500 | 250 | |
| 4. Potential to Release (lines 2d + 3c, subject to a maximum of 500) | 500 | 340 | |
| 5. Liklihood of Release (higher of lines 1 and 4) | 550 | | 340 |
| **Waste Characteristics** | | | |
| 6. Toxicity/Persistence | a | 1000 | |
| 7. Hazardous Waste Quantity | a | 10 | |
| 8. Waste Characteristics | 100 | | 10 |
| **Targets** | | | |
| 9. Nearest Intake | 50 | 0 | |
| 10. Population | | | |
| 10a. Level I Concentrations | b | | |
| 10b. Level II Concentrations | b | 0 | |
| 10c. Potential Contamination | b | 0 | |
| 10d. Population (lines 10a + 10b + 10c) | b | 0 | |
| 11. Resources | 5 | 5 | |
| 12. Targets (lines 9 + 10d + 11) | b | | 5 |

## Drinking Water Threat Score

| | | | |
|---|---|---|---|
| 13. Drinking Water Threat Score [(lines 5 x 8 x 12)/82,500], subject to a maximum of 100) | 100 | | 0.2 |

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET (CONTINUED)

## Human Food Chain Threat

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 14. Liklihood of Release (same value as line 5) | 550 | | 200 |
| **Waste Characteristics** | | | |
| 15. Toxicity/Persistence/Bioaccumulation | a | 50000000 | |
| 16. Hazardous Waste Quantity | a | 10 | |
| 17. Waste Characteristics | 1000 | | 100 |
| **Targets** | | | |
| 18. Food Chain Individual | 50 | 0 | |
| 19. Population | | | |
| 19a. Level I Concentrations | b | | |
| 19b. Level II Concentrations | b | | |
| 19c. Potential Contamination | b | 0 | |
| 19d. Population (lines 10a + 10b + 10c) | b | 0 | |
| 20. Targets (lines 18 + 19d) | b | | 0 |

## Human Food Chain Threat Score

| | | | |
|---|---|---|---|
| 21. Human Food Chain Threat Score [(lines 14 x 17 x 20)/82,500], subject to a maximum of 100) | 100 | | 0 |

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET (CONTINUED)

## Environmental Threat

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 22. Liklihood of Release (same value as line 5) | 550 | | 340 |
| **Waste Characteristics** | | | |
| 23. Ecosystem Toxicity/Persistence/Bioaccumulation | a | 500000000 | |
| 24. Hazardous Waste Quantity | a | 10 | |
| 25. Waste Characteristics | 1,000 | | 180 |
| **Targets** | | | |
| 26. Sensitive Environments | | | |
| 26a. Level I Concentrations | b | | |
| 26b. Level II Concentrations | b | | |
| 26c. Potential Contamination | b | 0.15 | |
| 26d. Sensitive Environments (lines 26a + 26b + 26c) | b | 0.15 | |
| 27. Targets (value from line 26d) | b | | 0.15 |

## Environmental Threat Score

| | | | |
|---|---|---|---|
| 28. Environmental Threat Score [(lines 22 x 25 x 27)/ 82,500, subject to a maximum score of 60) | 60 | | |

## Surface Water Overland/Flood Migration Component Score for a Watershed

| | | | |
|---|---|---|---|
| 29. Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum score of 100) | 100 | | 0.3 |

## Surface Water Overland/Flood Component Score

| | | | |
|---|---|---|---|
| 30. Component Score ($S_{SW}$)[c] (highest score from line 29 for all watersheds evaluated, subject to a maximum score of 100) | 100 | | 0.3 |

[a] Maximum value applies to waste characteristics category

[b] Maximum value not applicable

[c] Do not round to nearest integer

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# SOIL EXPOSURE PATHWAY SCORESHEET

## Resident Population Threat

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 1. Liklihood of Exposure | 550 | | 550 |
| **Waste Characteristics** | | | |
| 2. Toxicity | a | 1000 | |
| 3. Hazardous Waste Quantity | a | 10 | |
| 4. Waste Characteristics | 100 | | 10 |
| **Targets** | | 0 | |
| 5. Resident Individual | 50 | | |
| 6. Resident Population | | | |
| 6a. Level I Concentrations | b | | |
| 6b. Level II Concentrations | b | | |
| 6c. Resident Population (lines 6a + 6b) | b | | |
| 7. Workers | 15 | 0 | |
| 8. Resources | 5 | 0 | |
| 9. Terrestrial Sensitive Environments | c | 0 | |
| 10. Targets (lines 5 + 6c + 7 + 8 + 9) | b | | 0 |

## Resident Population Threat Score

| | | | |
|---|---|---|---|
| 11. Resident Population Threat [(lines 1 x 4 x 10)/82,500] | b | | 0 |

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# SOIL EXPOSURE PATHWAY SCORESHEET (continued)

## Nearby Population Threat

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 12. Attractiveness/Accessibility | 100 | 10 | |
| 13. Area of Contamination | 100 | 5 | |
| 14. Liklihood of Exposure | 500 | | 5 |
| **Waste Characteristics** | | | |
| 15. Toxicity | a | 1000 | |
| 16. Hazardous Waste Quantity | a | 10 | |
| 17. Waste Characteristics | 100 | | 10 |
| **Targets** | | | |
| 18. Nearby Individual | 1 | 1 | |
| 19. Population Within 1 Mile | b | 0.6 | |
| 20. Targets (lines 18 + 19) | b | | 1.6 |
| **Nearby Popuation Threat Score** | | | |
| 21. Nearby Population Threat (lines 14 x 17 x 20)/(82,500) | b | | 0.04 |
| **Soil Exposure Pathway Score** | | | |
| 22. Soil Exposure Pathway Score ($S_S$), (lines 11 + 21, subject to a maximum score of 100) | 100 | | 0.04 |

a Maximum value applies to waste characteristics category.

b Maximum value not applicable.

c No specific maximum value applies to factor. However, pathway score based solely on sensitive environments is limited to maximum score of 60.

d Do not round to nearest integer.

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# AIR MIGRATION PATHWAY SCORESHEET

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 1. Observed Release | 550 | 0 | |
| 2. Potential to Release | | | |
| 2a. Gas Potential to Release | 500 | 300 | |
| 2b. Particulate Potential to Release | 500 | 250 | |
| 2c. Potential to Release (higher of lines 2a and 2b) | 500 | 300 | |
| 3. Liklihood of Release (higher of lines 1 and 2c) | 550 | | 300 |
| **Waste Characteristics** | | | |
| 4. Toxicity/Mobility | a | | |
| 5. Hazardous Waste Quantity | a | | |
| 6. Waste Characteristics | 100 | | 1 |
| **Targets** | | | |
| 7. Nearest Individual | 50 | 20 | |
| 8. Population | | | |
| 8a. Level I Concentrations | b | | |
| 8b. Level II Concentrations | b | | |
| 8c. Potential Contamination | b | 1.3 | |
| 8d. Population (lines 8a + 8b + 8c) | b | 2.3 | |
| 9. Resources | 5 | 0 | |
| 10. Sensitive Environments | | | |
| 10a. Actual Contamination | c | 0 | |
| 10b. Potential Contamination | c | 0.24 | |
| 10c. Sensitive Environments (lines 10a + 10b) | c | 0.24 | |
| 11. Targets (lines 7 + 8d + 9 + 10c) | b | | 21.54 |
| **Air Migration Pathway Score** | | | |
| 12. Pathway Score ($S_A$) [(lines 3 x 6 x 11)/82,500][d] | 100 | | 0.16 |

a Maximum value applies to waste characteristics category

b Maximum value not applicable

c No specific maximum value applies to factor. However, pathway score based solely on sensitive environments is limited to a maximum score of 60.

d Do not round to nearest integer

# SITE INSPECTION WORKSHEETS

| CERCLIS IDENTIFICATION NUMBER |
|---|
| GA D082832841 |

| SITE LOCATION | | | |
|---|---|---|---|
| SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE<br>**Woolfolk Chemical - Lennox Warehouse** | | | |
| STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFIER<br>**Intersection of Rentz Avenue and East Coqutt Street** | | | |
| CITY<br>**Lennox** | STATE<br>**GA** | ZIP CODE | TELEPHONE<br>( ) |
| COORDINATES: LATITUDE and LONGITUDE<br>**31°16'17"; 83°27'45"** | TOWNSHIP, RANGE, AND SECTION | | |

| OWNER/OPERATOR IDENTIFICATION | | | | | |
|---|---|---|---|---|---|
| OWNER<br>**Bobby Lindsey**<br>**Woolfolk Chemical** | | | OPERATOR | | |
| OWNER ADDRESS<br>**103 Magnolia Drive; P.O 1809** | | | OPERATOR ADDRESS | | |
| CITY<br>**Tifton** | | | CITY | | |
| STATE<br>**GA** | ZIP CODE<br>**31794** | TELEPHONE<br>**(912) 386-4300** | STATE | ZIP CODE | TELEPHONE<br>( ) |

| SITE EVALUATION | | |
|---|---|---|
| AGENCY/ORGANIZATION<br>**U.S. Environmental Protection Agency** | | |
| INVESTIGATOR<br>**BLACK & VEATCH Waste Science, Inc.** | | |
| CONTACT<br>**Jon A. Erskine** | | |
| ADDRESS<br>**2300 Clayton Road, Suite 220** | | |
| CITY<br>**Concord** | STATE<br>**CA** | ZIP CODE<br>**94520** |
| TELEPHONE<br>**( 510 246-8010** | | |

## GENERAL INFORMATION

Site Description and Operational History: Provide a brief description of the site and its operational history. State the site name, owner, operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note whether these activities are documented or alleged. Identify all source types and prior spills, floods, or fires. Summarize highlights of the PA and other investigations. Cite references.

**See Attached.**

## GENERAL INFORMATION (continued)

Site Sketch: Provide a sketch of the site. Indicate all pertinent features of the site and nearby environments including sources of wastes, areas of visible and buried wastes, buildings, residences, access roads, parking areas, fences, fields, drainage patterns, water bodies, vegetation, wells, sensitive environments, and other features.

**See Attached.**

## GENERAL INFORMATION (continued)

**Source Descriptions:** Describe all sources at the site. Identify source type and relate to waste disposal operations. Provide source dimensions and the best available waste quantity information. Describe the condition of sources and all containment structures. Cite references.

### SOURCE TYPES

**Landfill:** A man-made (by excavation or construction) or natural hole in the ground into which wastes have come to be disposed by backfilling, or by contemporaneous soil deposition with waste disposal.

**Surface Impoundment:** A natural topographic depression, man-made excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold an accumulation of liquid wastes, wastes containing free liquids, or sludges not backfilled or otherwise covered; depression may be wet with exposed liquid or dry if deposited liquid has evaporated, volatilized or leached; structures that may be described as lagoon, pond, aeration pit, settling pond, tailings pond, sludge pit; also a surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled).

**Drum:** A portable container designed to hold a standard 55-gallon volume of wastes.

**Tank and Non-Drum Container:** Any device, other than a drum, designed to contain an accumulation of waste that provides structural support and is constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic); any portable or mobile device in which waste is stored or otherwise handled.

**Contaminated Soil:** An area or volume of soil onto which hazardous substances have been spilled, spread, disposed, or deposited.

**Pile:** Any non-containerized accumulation above the ground surface of solid, non-flowing wastes; includes open dumps. Some types of waste piles are:

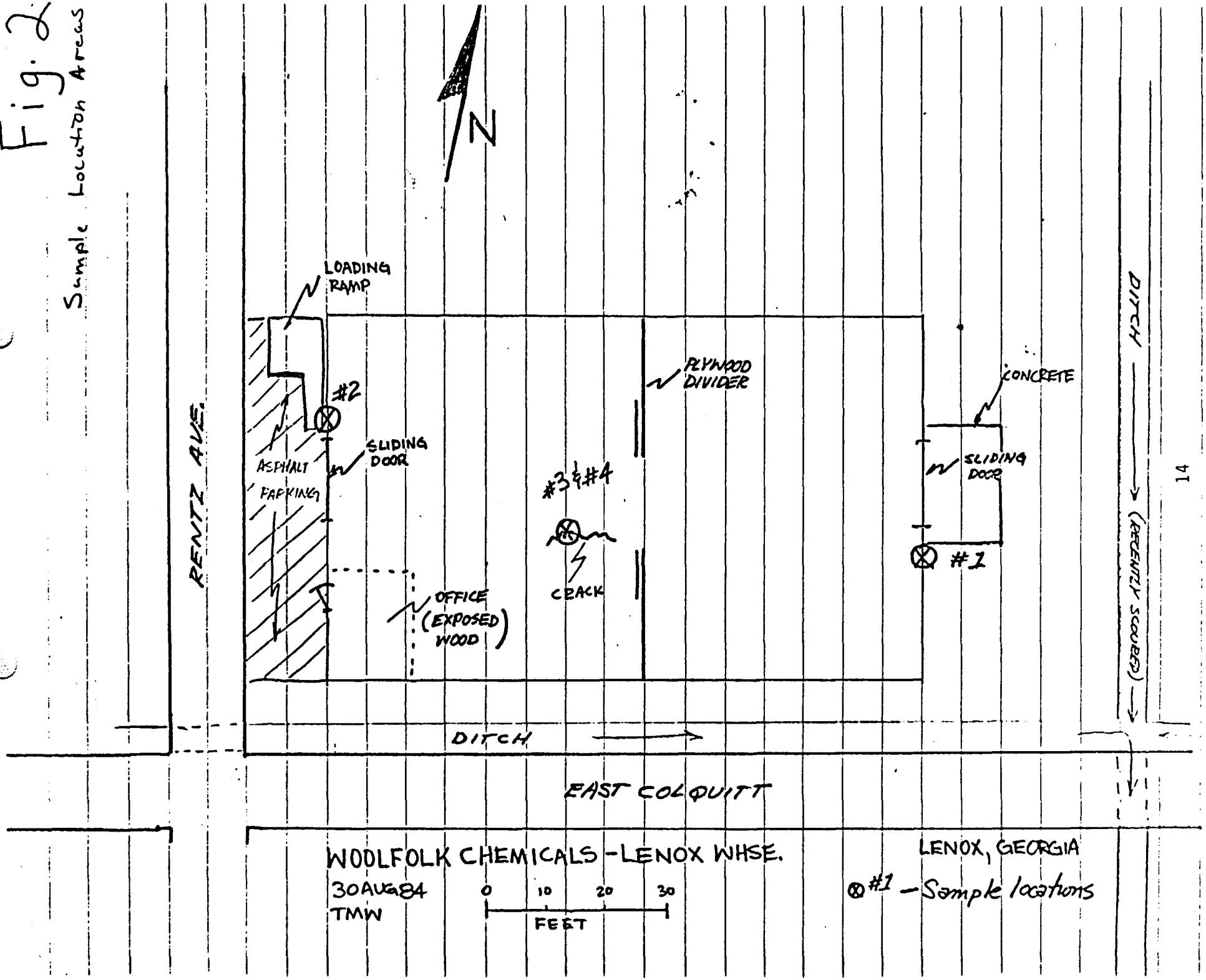
- Chemical Waste Pile: A pile consisting primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks.
- Scrap Metal or Junk Pile: A pile consisting primarily of scrap metal or discarded durable goods (such as appliances, automobiles, auto parts, batteries, etc.) composed of materials containing hazardous substances.
- Tailings Pile: A pile consisting primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation.
- Trash Pile: A pile consisting primarily of paper, garbage, or discarded non-durable goods containing hazardous substances.

**Land Treatment:** Landfarming or other method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

**Other:** Sources not in categories listed above.

Fig. 2

Sample Location Areas



## GENERAL INFORMATION (continued)

Source Description: Include description of containment per pathway for ground water (see HRS Table 3-2), surface water (see HRS Table 4-2), and air (see HRS Tables 6-3 and 6-9).

**Contaminated Surface Soil, no functioning windbreak, runnoff system or fence.**

Hazardous Waste Quantity (HWQ) Calculation: SI Tables 1 and 2 (See HRS Tables 2-5, 2-6, and 5-2).

**An area could not be calculated from soil sample locations; therefore, a HWQFV default of 10 was used in accordance with Section 2.4.2.2. of the HRS.**

Attach additional pages, if necessary

HWQ =

## SI TABLE 1: HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

| | | Single Source Sites (assigned HWQ scores) | |
|---|---|---|---|
| (Column 1) TIER | (Column 2) Source Type | (Column 3) HWQ = 10 | (Column 4) HWQ = 100 |
| A Hazardous Constituent Quantity | N/A | HWQ = 1 if Hazardous Constituent Quantity data are complete<br><br>HWQ = 10 if Hazardous Constituent Quantity data are not complete | >100 to 10,000 lbs |
| B Hazardous Wastestream Quantity | N/A | ≤ 500,000 lbs | >500,000 to 50 million lbs |
| C Volume | Landfill | ≤ 6.75 million $ft^3$<br>≤ 250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ |
| | Surface impoundment | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| | Drums | ≤1,000 drums | >1,000 to 100,000 drums |
| | Tanks and non-drum containers | ≤50,000 gallons | >50,000 to 5 million gallons |
| | Contaminated soil | ≤6.75 million $ft^3$<br>≤250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ |
| | Pile | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| | Other | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| D Area | Landfill | ≤340,000 $ft^2$<br>≤7.8 acres | >340,000 to 34 million $ft^2$<br>>7.8 to 780 acres |
| | Surface impoundment | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres |
| | Contaminated soil | ≤3.4 million $ft^2$<br>≤78 acres | > 3.4 million to 340 million $ft^2$<br>> 78 to 7,800 acres |
| | Pile | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres |
| | Land treatment | ≤27,000 $ft^2$<br>≤0.62 acres | >27,000 to 2.7 million $ft^2$<br>>0.62 to 62 acres |

TABLE 1 (CONTINUED)

| Single Source Sites (assigned HWQ scores) | | Multiple Source Sites | | |
|---|---|---|---|---|
| (Column 5) HWQ = 10,000 | (Column 6) HWQ = 1,000,000 | (Column 7) Divisors for Assigning Source WQ Values | (Column 2) Source Type | (Column 1) TIER |
| >10,000 to 1 million lbs | > 1 million lbs | lbs ÷ 1 | N/A | A Hazardous Constituent Quantity |
| >50 million to 5 billion lbs | > 5 billion lbs | lbs ÷ 5,000 | N/A | B Hazardous Wastestream Quantity |
| >675 million to 67.5 billion $ft^3$<br>>25 million to 2.5 billion $yd^3$ | > 67.5 billion $ft^3$<br>> 2.5 billion $yd^3$ | $ft^3$ ÷ 67,500<br>$yd^3$ ÷ 2,500 | Landfill | C Volume |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Surface Impoundment | |
| >100,000 to 10 million drums | > 10 million drums | drums ÷ 10 | Drums | |
| >5 million to 500 million gallons | > 500 million gallons | gallons ÷ 500 | Tanks and non-drum containers | |
| >675 million to 67.5 billion $ft^3$<br>>25 million to 2.5 billion $yd^3$ | > 67.5 billion $ft^3$<br>> 2.5 billion $yd^3$ | $ft^3$ ÷ 67,500<br>$yd^3$ ÷ 2,500 | Contaminated Soil | |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Pile | |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Other | |
| >34 million to 3.4 billion $ft^2$<br>>780 to 78,000 acres | > 3.4 billion $ft^2$<br>>78,000 acres | $ft^2$ ÷ 3,400<br>acres ÷ 0.078 | Landfill | D Area |
| >130,000 to 13 million $ft^2$<br>>2.9 to 290 acres | > 13 million $ft^2$<br>> 290 acres | $ft^2$ ÷ 13<br>acres ÷ 0.00029 | Surface Impoundment | |
| > 340 million to 34 billion $ft^2$<br>> 7,800 to 780,000 acres | > 34 billion $ft^2$<br>> 780,000 acres | $ft^2$ ÷ 34,000<br>acres ÷ 0.78 | Contaminated Soil | |
| > 130,000 to 13 million $ft^2$<br>> 2.9 to 290 acres | > 13 million $ft^2$<br>> 290 acres | $ft^2$ ÷ 13<br>acres ÷ 0.00029 | Pile | |
| >2.7 million to 270 million $ft^2$<br>>62 to 6,200 acres | > 270 million $ft^2$<br>> 6,200 acres | $ft^2$ ÷ 270<br>acres ÷ 0.0062 | Land Treatment | |

## HAZARDOUS WASTE QUANTITY (HWQ) CALCULATION

For each migration pathway, evaluate HWQ associated with sources that are available (i.e., incompletely contained) to migrate to that pathway. (Note: If *Actual Contamination Targets* exist for ground water, surface water, or air migration pathways, assign the calculated HWQ score or 100, whichever is greater, as the HWQ score for that pathway.) For each source, evaluate HWQ for one or more of the four tiers (SI Table 1; HRS Table 2-5) for which data exist: constituent quantity, wastestream quantity, source volume, and source area. Select the tier that gives the highest value as the source HWQ. Select the source volume HWQ rather than source area HWQ if data for both tiers are available.

Column 1 of SI Table 1 indicates the quantity tier. Column 2 lists source types for the four tiers. Columns 3, 4, 5, and 6 provide ranges of waste amount for sites with only one source, corresponding to HWQ scores at the tops of the columns. Column 7 provides formulas to obtain source waste quantity values at sites with multiple sources.

1. Identify each source type.
2. Examine all waste quantity data available for each source. Record constituent quantity and waste stream mass or volume. Record dimensions of each source.
3. Convert source measurements to appropriate units for each tier to be evaluated.
4. For each source, use the formulas in the last column of SI Table 1 to determine the waste quantity value for each tier that can be evaluated. Use the waste quantity value obtained from the highest tier as the quantity value for the source.
5. Sum the values assigned to each source to determine the total site waste quantity.
6. Assign HWQ score from SI Table 2 (HRS Table 2-6).

Note these exceptions to evaluate soil exposure pathway HWQ (see HRS Table 5-2):

- The divisor for the area (square feet) of a landfill is 34,000.
- The divisor for the area (square feet) of a pile is 34.
- Wet surface impoundments and tanks and non-drum containers are the only sources for which volume measurements are evaluated for the soil exposure pathway.

SI TABLE 2: HWQ SCORES FOR SITES

| Site WQ Total | HWQ Score |
|---|---|
| 0 | 0 |
| 1[a] to 100 | 1[b] |
| > 100 to 10,000 | 100 |
| > 10,000 to 1 million | 10,000 |
| > 1 million | 1,000,000 |

[a] If the WQ total is between 0 and 1, round it to 1.
[b] If the hazardous constituent quantity data are not complete, assign the score of 10.

SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

Site Name: **Woolfolk Chemical**

References **1, SCDM March 1993**

Sources:

1. **Contaminated Soil**
2.
3.
4.
5.
6.
7.
8.
9.

| SOURCE | HAZARDOUS SUBSTANCE | TOXICITY | GROUND WATER PATHWAY | | SURFACE WATER PATHWAY | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | OVERLAND/FLOOD MIGRATION | | | | | | | GROUND WATER TO SURFACE WATER | | | |
| | | | GW Mobility (HRS Table 3-8) | Tox/ Mobility Value (HRS Table 3-9) | Per (HRS Tables 4-10 and 4-11) | Tox/Per Value (HRS Table 4-12) | Bioac Pot. (HRS Table 4-15) | Tox/ Pers/ Bioac Value (HRS Table 4-16) | Ecotox (HRS Table 4-19) | Ecotox/ Pers (HRS Table 4-20) | Ecotox/ Pers/ Bioacc Value (HRS Table 4-21) | Tox/ Mob/ Pers Value (HRS Table 4-26) | Tox/ Mob/ Pers/ Bioacc Value (HRS Table 4-28) | Ecotox/ Mob/ Pers Value (HRS Table 4-29) | Ecotox/ Mob/ Per/ Bioacc Value (HRS Table 4-30) |
| 1 | toxaphene | 1,000 | 0.01 | 10 | 1.0 | 1,000 | 50,000 | 5E+07 | 10,000 | 10,000 | 5E+08 | NOT SCORED | | | |

## Ground Water Observed Release Substances Summary Table

On SI Table 4, list the hazardous substances associated with the site detected in ground water samples for that aquifer. Include only those substances directly observed or with concentrations significantly greater than background levels. Obtain toxicity values from the Superfund Chemical Data Matrix (SCDM). Assign mobility a value of 1 for all observed release substances regardless of the aquifer being evaluated. For each substance, multiply the toxicity by the mobility to obtain the toxicity/mobility factor value; enter the highest toxicity/mobility value for the aquifer in the space provided.

## Ground Water Actual Contamination Targets Summary Table

If there is an observed release at a drinking water well, enter each hazardous substance meeting the requirements for an observed release by well and sample ID on SI Table 5 and record the detected concentration. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population using the well as a Level I target. If these percentages are less than 100% or all are N/A, evaluate the population using the well as a Level II target for that aquifer.

## SI TABLE 4: GROUND WATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

| Sample ID | Hazardous Substance | Bckgrd. Conc. | Toxicity/ Mobility | References |
|---|---|---|---|---|
| **N/A** | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | Highest Toxicity/Mobility | | |

**NONE**

## SI TABLE 5: GROUND WATER ACTUAL CONTAMINATION TARGETS

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# GROUND WATER PATHWAY
## GROUND WATER USE DESCRIPTION

Describe Ground Water Use within 4 Miles of the Site:
Describe generalized stratigraphy, aquifers, municipal and private wells

**Groundwater is taken from the Ocala Aquifer at 350 ft below ground surface. The city of Lennox draws water from 2 deep wells. The wells serve 891 residents. The stratigraphy at the site is composed of Sand, Clay, and limestone.**

Show Calculations of Ground Water Drinking Water Populations for each Aquifer:
Provide apportionment calculations for blended supply systems.
County average number of persons per household: _____ Reference **Ref. 4**

**No private groundwater wells within 4 miles. Municipal system serves 891 people. It consists of 2 municipal wells. No surface water. Each well serves approx. 445.5 people.**

| | | |
|---|---|---|
| **0 wells** | **0 - 1/4 mile:** | **0** |
| **2 municipal wells** | **1/4 - 1/2 mile:** | **2 x 445.5 = 891** |
| **0 wells** | **1/2 - 1 mile:** | **0** |
| **0 wells** | **1 - 2 miles:** | **0** |
| **0 wells** | **2 - 3 miles:** | **0** |
| **0 wells** | **3 -4 miles:** | **0** |

# GROUND WATER PATHWAY WORKSHEET

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4. | 0 | H | 1 |
| 2. POTENTIAL TO RELEASE: Depth to aquifer: 173 feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3. | 220 | E/H | 1,4 |
| LR = | 220 | | |

| TARGETS | | | |
|---|---|---|---|
| Are any wells part of a blended system? Yes____ No X<br>If yes, attach a page to show apportionment calculations.<br><br>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5).<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ Total = | 0 | H | 1 |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1. | 32.4 | E/H | 1 |
| 5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles, assign 0. | 18 | H | 1 |
| 6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a ground water observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0. | 0 | E | 1 |
| 7. RESOURCES: Assign a score of 5 if one or more ground water resource applies; assign 0 if none applies.<br><br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering of commercial livestock<br>• Ingredient in commercial food preparation<br>• Supply for commercial aquaculture<br>• Supply for a major or designated water recreation area, excluding drinking water use | 5 | E | 4 |
| Sum of Targets T= | 55.4 | | |

SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS

SI Table 6a: Other Than Karst Aquifers

| Distance from Site | Pop. | Nearest Well (choose highest) | Population Served by Wells within Distance Category | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to $\frac{1}{4}$ mile | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | | |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | **891** | 18 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | **324** | **1,4** |
| > $\frac{1}{2}$ to 1 mile | | 9 | 1 | 5 | 17 | 52 | 167 | 523 | 1,669 | 5,224 | 16,684 | 52,239 | 166,835 | 522,385 | | |
| > 1 to 2 miles | | 5 | 0.7 | 3 | 10 | 30 | 94 | 294 | 939 | 2,939 | 9,385 | 29,384 | 93,845 | 293,842 | | |
| > 2 to 3 miles | | 3 | 0.5 | 2 | 7 | 21 | 68 | 212 | 678 | 2,122 | 6,778 | 21,222 | 67,777 | 212,219 | | |
| >3 to 4 miles | | 2 | 0.3 | 1 | 4 | 13 | 42 | 131 | 417 | 1,306 | 4,171 | 13,060 | 41,709 | 130,596 | | |

Nearest Well = **18**

Sum = **324**

SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS (continued)

SI Table 6b: Karst Aquifers

| Distance from Site | Pop. | Nearest Well (choose highest) | Population Served by Wells within Distance Category | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to $\frac{1}{4}$ mile | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | | |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | | 20 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | | |
| > $\frac{1}{2}$ to 1 mile | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| > 1 to 2 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| > 2 to 3 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| >3 to 4 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |

Nearest Well = [ ]  Sum = [ ]

# GROUND WATER PATHWAY WORKSHEET (concluded)

| WASTE CHARACTERISTICS | Score | Data Type | Does not Apply |
|---|---|---|---|
| 8. If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to ground water. | 10 | E | |
| 9. Assign the highest ground water toxicity/mobility value from SI Table 3 or 4. | 10 | | |
| 10. Multiply the ground water toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7) | 3 | | |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

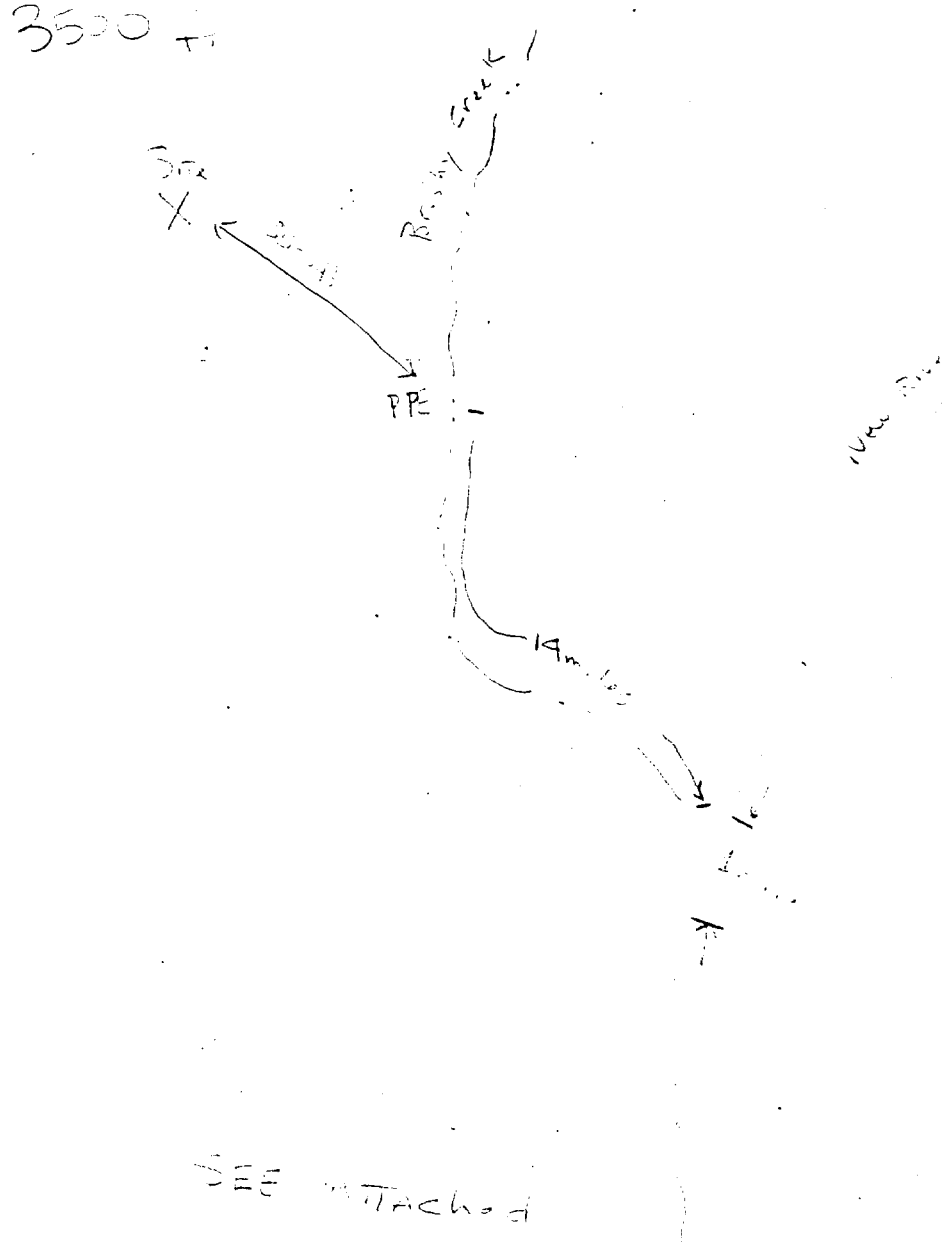
WC = 3

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the ground water pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

GROUND WATER PATHWAY SCORE: $\frac{LR \times T \times WC}{82,500}$ **0.4** (Maximum of 100)

# SURFACE WATER PATHWAY

**Sketch of the Surface Water Migration Route:**
Label all surface water bodies. Include runoff route and drainage direction, probable point of entry, and 15-mile target distance limit. Mark sample locations, intakes, fisheries, and sensitive environments. Indicate flow directions, tidal influence, and rate.



# SURFACE WATER PATHWAY

## Surface Water Observed Release Substances Summary Table

On SI Table 7, list the hazardous substances detected in surface water samples for the watershed, which can be attributed to the site. Include only those substances in observed releases (direct observation) or with concentration levels significantly above background levels. Obtain toxicity, persistence, bioaccumulation potential, and ecotoxicity values from SCDM. Enter the highest toxicity/persistence, toxicity/persistence/bioaccumulation, and ecotoxicity/persistence/ecobioaccumulation values in the spaces provided.

- TP = Toxicity x Persistence
- TPB = TP x bioaccumulation
- ETPB = EP x bioaccumulation (EP = ecotoxicity x persistence)

## Drinking Water Actual Contamination Targets Summary Table

For an observed release at or beyond a drinking water intake, on SI Table 8 enter each hazardous substance by sample ID and the detected concentration. For surface water sediment samples detecting a hazardous substance at or beyond an intake, evaluate the intake as Level II contamination. Obtain benchmark, cancer risk, and reference dose concentrations for each substance from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages of the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population served by the intake as a Level I target. If the percentages are less than 100% or all are N/A, evaluate the population served by the intake as a Level II target.

## SI TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

**NONE.**

| Sample ID | Hazardous Substance | Bckgrd. Conc. | Toxicity/ Persistence | Toxicity/ Persis./ Bioaccum | Ecotoxicity/ Persis/ Ecobioaccum | References |
|---|---|---|---|---|---|---|
| 0 | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | Highest Values | | | | |

## SI TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# SURFACE WATER PATHWAY
## LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

| LIKELIHOOD OF RELEASE– OVERLAND/FLOOD MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. | 0 | | 1,4 |
| 2. POTENTIAL TO RELEASE: Distance to surface water: 3500 (feet) If sampling data do not support a release to surface water in the watershed, use the table below to assign a score from the table below based on distance to surface water and flood frequency. | 340 | E | 1,4,7 |
| Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2 | | | |
| LR = | 340 | | |

| Distance to surface water <2500 feet | 500 |
|---|---|
| Distance to surface water >2500 feet. and: | |
| Site in annual or 10-yr floodplain | 500 |
| Site in 100-yr floodplain | 400 |
| Site in 500-yr floodplain | 300 |
| Site outside 500-yr floodplain | 100 |

| LIKELIHOOD OF RELEASE GROUND WATER TO SURFACE WATER MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. | NOT SCORED | | |
| NOTE: Evaluate ground water to surface water migration only for a surface water body that meets all of the following conditions:<br>1) A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0.<br>2) No aquifer discontinuity is established between the source and the above portion of the surface water body.<br>3) The top of the uppermost aquifer is at or above the bottom of the surface water.<br>Elevation of top of uppermost aquifer _____<br>Elevation of bottom of surface water body _____ | 0 | | |
| 2. POTENTIAL TO RELEASE: Use the ground water potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2. | | | 3.12 |
| LR = | | | |

## SURFACE WATER PATHWAY
### LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET (CONTINUED)

| DRINKING WATER THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type, flow, and number of people served by each drinking water intake within the target distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5.<br><br>Intake Name / Water Body Type / Flow / People Served<br>_____ _____ _____ _____<br>_____ _____ _____ _____<br>_____ _____ _____ _____<br><br>Are any intakes part of a blended system? Yes _____ No X<br>If yes, attach a page to show apportionment calculations.<br><br>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8).<br><br>_____ , _____<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ Total = | 0 | H | 1 |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1. | 0 | H | 1 |
| 5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0. | 0 | H | 1 |
| 6. RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign 0 if none applies.<br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering of commercial livestock<br>• Ingredient in commercial food preparation<br>• Major or designated water recreation area, excluding drinking water use | 5 | E | |
| SUM OF TARGETS T= | 5 | | |

SI TABLE 9 (From HRS Table 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY

| Type of Surface Water Body | Pop. | Nearest Intake | Number of people | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,000 | 10,001 to 30,000 | |
| Minimal Stream (<10 cfs) | | 20 | 0 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | |
| Small to moderate stream (10 to 100 cfs) | | 2 | 0 | 0.4 | 2 | 5 | 16 | 52 | 163 | 521 | 1,633 | |
| Moderate to large stream (> 100 to 1,000 cfs) | | 0 | 0 | 0.04 | 0.2 | 0.5 | 2 | 5 | 16 | 52 | 163 | |
| Large Stream to river (>1,000 to 10,000 cfs) | | 0 | 0 | 0.004 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | 5 | 16 | |
| Large River (> 10,000 to 100,000 cfs) | | 0 | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 16 | |
| Very Large River (>100,000 cfs) | | 0 | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Shallow ocean zone or Great Lake (depth < 20 feet) | | 0 | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | |
| Moderate ocean zone or Great Lake (Depth 20 to 200 feet) | | 0 | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Deep ocean zone or Great Lake (depth > 200 feet) | | 0 | 0 | 0 | 0 | 0 | 0.001 | 0.003 | 0.008 | 0.03 | 0.08 | |
| 3-mile mixing zone in quiet flowing river (≥ 10 cfs) | | 10 | 0 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | |
| Nearest Intake = | | 0 | | | | | | | | | Sum = | 0 |

References 1,4,7

# SURFACE WATER PATHWAY

## Human Food Chain Actual Contamination Targets Summary Table

On SI Table 10, list the hazardous substances detected in sediment, aqueous, sessile benthic organism tissue, or fish tissue samples (taken from fish caught within the boundaries of the observed release) by sample ID and concentration. Evaluate fisheries within the boundaries of observed releases detected by sediment or aqueous samples as Level II, if at least one observed release substance has a bioaccumulation potential factor value of 500 or greater (see SI Table 7). Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For FDAAL benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate this portion of the fishery as subject to Level I concentrations. If the percentages are less than 100% or all are N/A, evaluate the fishery as a Level II target.

## Sensitive Environment Actual Contamination Targets Summary Table

On SI Table 11, list each hazardous substance detected in aqueous or sediment samples at or beyond wetlands or a surface water sensitive environment by sample ID. Record the concentration. If contaminated sediments or tissues are detected at or beyond a sensitive environment, evaluate the sensitive environment as Level II. Obtain benchmark concentrations from SCDM. For AWQC/AALAC benchmarks, determine the highest percentage of benchmark of the substances detected in aqueous samples. If benchmark concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage equals or exceeds 100%, evaluate that part of the sensitive environment subject to Level I concentrations. If the percentage is less than 100%, or all are N/A, evaluate the sensitive environment as Level II.

SI TABLE 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED **NONE.**

Fishery ID: _____ Sample Type _____ Level I _____ Level II _____ References _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Benchmark Concentration (FDAAL) | % of Benchmark | Cancer Risk Concentration. | % of Cancer Risk Concentration | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

| Sample ID | Hazardous Substance | Conc.. (µg/L) | Benchmark Concentration (AWQC or AALAC) | % of Benchmark | References |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | Highest Percent | | |

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

| Sample ID | Hazardous Substance | Conc.. (µg/L) | Benchmark Concentration (AWQC or AALAC) | % of Benchmark | References |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | Highest Percent | | |

# SURFACE WATER PATHWAY (continued)
## HUMAN FOOD CHAIN THREAT WORKSHEET

| HUMAN FOOD CHAIN THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page. | | | |
| Fishery Name **NEW RIVER** Water Body **Stream** Flow **200** cfs | | | |
| Species_____ Production_____ lbs/yr | | | |
| Species_____ Production_____ lbs/yr | | | |
| Fishery Name_____ Water Body_____ Flow_____ cfs | | | |
| Species_____ Production_____ lbs/yr | | | |
| Species_____ Production_____ lbs/yr | | | |
| Fishery Name_____ Water Body_____ Flow_____ cfs | | | |
| Species_____ Production_____ lbs/yr | | | |
| Species_____ Production_____ lbs/yr | | | |
| FOOD CHAIN INDIVIDUAL **20 x 0.01** | **0** | **E** | **7** |
| 7. ACTUAL CONTAMINATION FISHERIES: | | | |
| If analytical evidence indicates that a fishery has been exposed to a hazardous substance with a bioaccumulation factor greater than or equal to 500 (SI Table 10), assign a score of 50 if there is a Level I fishery. Assign 45 if there is a Level II fishery, but no Level I fishery. | | | |
| 8. POTENTIAL CONTAMINATION FISHERIES: | | | |
| If there is a release of a substance with a bioaccumulation factor greater than or equal to 500 to a watershed containing fisheries within the target distance limit, but there are no Level I or Level II fisheries, assign a score of 20. | | | |
| If there is no observed release to the watershed, assign a value for potential contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit: | | | |

| Lowest Flow | FCI Value |
|---|---|
| <10 cfs | 20 |
| 10 to 100 cfs | 2 |
| >100 cfs, coastal tidal waters, oceans, or Great Lakes | 0 |
| 3-mile mixing zone in quiet flowing river | 10 |

| | | | |
|---|---|---|---|
| **0.03 x 0.01 x 0.1 Population** XXXXXXXXXX FCI Value = | **0.00003** | **E** | |
| SUM OF TARGETS T = | **0.00003** | | |

# SURFACE WATER PATHWAY (continued)
# ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

| ENVIRONMENTAL THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|

Record the water body type and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of 0 at the bottom of the page.

| Environment Name | Water Body Type | Flow |
|---|---|---|
| **American Alligator** | **Stream** | **200** cfs |
| **Indigo Snake** | **Stream** | **200** cfs |
| | | cfs |
| | | cfs |
| | | cfs |

9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table 11, and assign a factor value for the environment (SI Tables 13 and 14).

| Environment Name | Environment Type and Value (SI Tables 13 & 14) | Multiplier (10 for Level I, 1 for Level II) | Product |
|---|---|---|---|
| | | x = | |
| | | x = | |
| | | x = | |
| | | x = | |
| | | Sum = | |

10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:

| Flow | Dilution Weight (SI Table 12) | | Environment Type and Value (SI Tables 13 & 14) | | Pot. Cont. | Product | Score | Data Type | Refs |
|---|---|---|---|---|---|---|---|---|---|
| **200** cfs | **0.01** | x | **American Alligator** | **75** x | 0.1 = | **0.075** | **0.15** | **E/H** | **1,7** |
| **200** cfs | **0.01** | x | **Indigo Snake** | **75** x | 0.1 = | **0.075** | | | |
| cfs | | x | | x | 0.1 = | | | | |
| cfs | | x | | x | 0.1 = | | | | |
| cfs | | x | | x | 0.1 = | | | | |
| | | | | | Sum = | | | | |

T = **0.15**

SI TABLE 12 (HRS Table 4-13):
SURFACE WATER DILUTION WEIGHTS

| Type of Surface Water Body | | Assigned Dilution Weight |
|---|---|---|
| Descriptor | Flow Characteristics | |
| Minimal stream | < 10 cfs | 1 |
| Small to moderate stream | 10 to 100 cfs | 0.1 |
| Moderate to large stream | > 100 to 1,000 cfs | 0.01 |
| Large stream to river | > 1,000 to 10,000 cfs | 0.001 |
| Large river | > 10,000 to 100,000 cfs | 0.0001 |
| Very large river | > 100,000 cfs | 0.00001 |
| Coastal tidal waters | Flow not applicable; depth not applicable | 0.001 |
| Shallow ocean zone or Great Lake | Flow not applicable; depth less than 20 feet | 0.001 |
| Moderate depth ocean zone or Great Lake | Flow not applicable; depth 20 to 200 feet | 0.0001 |
| Deep ocean zone or Great Lake | Flow not applicable; depth greater than 200 feet | 0.000005 |
| 3-mile mixing zone in quiet flowing river | 10 cfs or greater | 0.5 |

## SI TABLE 13 (HRS TABLE 4-23): SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

| SENSITIVE ENVIRONMENT | ASSIGNED VALUE |
|---|---|
| Critical habitat for Federal designated endangered or threatened species<br>Marine Sanctuary<br>National Park<br>Designated Federal Wilderness Area<br>Ecologically important areas identified under the Coastal Zone Wilderness Act<br>Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act<br>Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes)<br>National Monument (air pathway only)<br>National Seashore Recreation Area<br>National Lakeshore Recreation Area | 100 |
| Habitat known to be used by Federal designated or proposed endangered or threatened species<br>National Preserve<br>National or State Wildlife Refuge<br>Unit of Coastal Barrier Resources System<br>Coastal Barrier (undeveloped)<br>Federal land designated for the protection of natural ecosystems<br>Administratively Proposed Federal Wilderness Area<br>Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary<br>Migratory pathways and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time<br>Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding<br>National river reach designated as recreational | 75 |
| Habitat known to be used by State designated endangered or threatened species<br>Habitat known to be used by a species under review as to its Federal endangered or threatened status<br>Coastal Barrier (partially developed)<br>Federally designated Scenic or Wild River | 50 |
| State land designated for wildlife or game management<br>State designated Scenic or Wild River<br>State designated Natural Area<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |
| State designated areas for the protection of maintenance of aquatic life under the Clean Water Act | 5 |
| Wetlands See SI Table 14 (Surface Water Pathway) or SI Table 23 (Air Pathway) | |

## SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

| Total Length of Wetlands | Assigned Value |
|---|---|
| Less than 0.1 mile | 0 |
| 0.1 to 1 mile | 25 |
| Greater than 1 to 2 miles | 50 |
| Greater than 2 to 3 miles | 75 |
| Greater than 3 to 4 miles | 100 |
| Greater than 4 to 8 miles | 150 |
| Greater than 8 to 12 miles | 250 |
| Greater than 12 to 16 miles | 350 |
| Greater than 16 to 20 miles | 450 |
| Greater than 20 miles | 500 |

# SURFACE WATER PATHWAY (concluded)

## WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

| WASTE CHARACTERISTICS | Score |
|---|---|
| 14. If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, assign the calculated hazardous waste quantity score, or a score of 100, whichever is greater. | 10 |
| 15. Assign the highest value from SI Table 7 (observed release) or SI Table 3 (no observed release) for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat. | 10 |

| | Substance Value | | HWQ | | Product | WC Score (from Table) (Maximum of 100) |
|---|---|---|---|---|---|---|
| Drinking Water Threat Toxicity/Persistence | 1000 | x | 10 | = | 10,000 | 10 |
| Food Chain Threat Toxicity/Persistence Bioaccumulation | 5E+07 | x | 10 | = | 5E+08 | 100 |
| Environmental Threat Ecotoxicity/Persistence/ Ecobioaccumulation | 5E+08 | x | 10 | = | 5E+09 | 180 |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 to <1E + 09 | 100 |
| 1E + 09 to <1E + 10 | 180 |
| 1E + 10 to <1E + 11 | 320 |
| 1E + 11 to <1E + 12 | 560 |
| 1E + 12 or greater | 1000 |

## SURFACE WATER PATHWAY THREAT SCORES

| Threat | Likelihood of Release (LR) Score | Targets (T) Score | Pathway Waste Characteristics (WC) Score (determined above) | Threat Score $\frac{LR \times T \times WC}{82,500}$ |
|---|---|---|---|---|
| Drinking Water | 340 | 5 | 10 | (maximum of 100) 0.2 |
| Human Food Chain | 340 | 0.00003 | 100 | (maximum of 100) 0 |
| Environmental | 340 | 0.15 | 180 | (maximum of 60) 0.1 |

| | |
|---|---|
| SURFACE WATER PATHWAY SCORE (Drinking Water Threat + Human Food Chain Threat + Environmental Threat) | (maximum of 100) 0.3 |

## SOIL EXPOSURE PATHWAY

If there is no observed contamination (e.g., ground water plume with no known surface source), do not evaluate the soil exposure pathway. Discuss evidence for no soil exposure pathway.

### Soil Exposure Resident Population Targets Summary

For each property (duplicate page 35 as necessary):

If there is an area of observed contamination on the property and within 200 feet of a residence, school, or day care center, enter on Table 15 each hazardous substance by sample ID. Record the detected concentration. Obtain cancer risk, and reference dose concentrations from SCDM. Sum the cancer risk and reference dose percentages for the substances listed. If cancer risk or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the residents and students as Level I. If both percentages are less than 100% or all are N/A, evaluate the targets as Level II.

## SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# SOIL EXPOSURE PATHWAY WORKSHEET
## RESIDENT POPULATION THREAT

| LIKELIHOOD OF EXPOSURE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0. | 550 | H | 2 |
| LE = | 550 | | |

| TARGETS | | | |
|---|---|---|---|
| 2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on or within 200 feet of areas of observed contamination (HRS section 5.1.3).<br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ Sum = | 0 | H | 1 |
| 3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (*i.e.*, no Level I or Level II targets), assign 0 (HRS Section 5.1.3). | 0 | H | 1 |
| 4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities with areas of observed contamination associated with the site. | 0 | H | 1 |
| 5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination.<br>Sum = | 0 | E/H | 1 |
| 6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on an area of observed contamination at the site; assign 0 if none applies.<br>• Commercial agriculture<br>• Commercial silviculture<br>• Commercial livestock production or commercial livestock grazing | 0 | E/H | 1 |
| Total of Targets T= | 0 | | |

| Number of Workers | Score |
|---|---|
| 0 | 0 |
| 1 to 100 | 5 |
| 101 to 1,000 | 10 |
| >1,000 | 15 |

| Terrestrial Sensitive Environment Type | Value |
|---|---|
| | |
| | |
| | |
| | |
| | |

## SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

| *TERRESTRIAL SENSITIVE ENVIRONMENT* | *ASSIGNED VALUE* |
|---|---|
| Terrestrial critical habitat for Federal designated endangered or threatened species<br>National Park<br>Designated Federal Wilderness Area<br>National Monument | 100 |
| Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species<br>National Preserve (terrestrial)<br>National or State terrestrial Wildlife Refuge<br>Federal land designated for protection of natural ecosystems<br>Administratively proposed Federal Wilderness Area<br>Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding | 75 |
| Terrestrial habitat used by State designated endangered or threatened species<br>Terrestrial habitat used by species under review for Federal designated endangered or threatened status | 50 |
| State lands designated for wildlife or game management<br>State designated Natural Areas<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |

# SOIL EXPOSURE PATHWAY WORKSHEET
## NEARBY POPULATION THREAT

| LIKELIHOOD OF EXPOSURE | | Score | Data Type | Ref. |
|---|---|---|---|---|
| 7. Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6) | Value 10 | | | |
| Area of Contamination (from SI Table 18 or HRS Table 5-7) | Value 5 | 5 | | |
| Likelihood of Exposure (from SI Table 19 or HRS Table 5-8) | | | | |
| | LE = | 5 | | |

| TARGETS | Score | Data Type | Ref. |
|---|---|---|---|
| 8. Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated. | 0 | H | 4 |
| 9. Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (*i.e.*, properties that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS Table 5-10). Sum the population values and multiply by 0.1. | 0.6 | E/H | 3,4 |
| T = | 0.6 | | |

## SI TABLE 17 (HRS TABLE 5-6): ATTRACTIVENESS/ACCESSIBILITY VALUES

| Area of Observed Contamination | Assigned Value |
|---|---|
| Designated recreational area | 100 |
| Regularly used for public recreation (for example, vacant lots in urban area) | 75 |
| Accessible and unique recreational area (for example, vacant lots in urban area) | 75 |
| Moderately accessible (may have some access improvements–for example, gravel road) with some public recreation use | 50 |
| Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use | 25 |
| Accessible with no public recreation use | 10 |
| Surrounded by maintained fence or combination of maintained fence and natural barriers | 5 |
| Physically inaccessible to public, with no evidence of public recreation use | 0 |

## SI TABLE 18 (HRS TABLE 5-7): AREA OF CONTAMINATION FACTOR VALUES

| Total area of the areas of observed contamination (square feet) | Assigned Value |
|---|---|
| ≤ to 5,000 | 5 |
| > 5,000 to 125,000 | 20 |
| > 125,000 to 250,000 | 40 |
| > 250,000 to 375,000 | 60 |
| > 375,000 to 500,000 | 80 |
| > 500,000 | 100 |

## SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

| AREA OF CONTAMINATION FACTOR VALUE | ATTRACTIVENESS/ACCESSIBILITY FACTOR VALUE | | | | | | |
|---|---|---|---|---|---|---|---|
| | 100 | 75 | 50 | 25 | 10 | 5 | 0 |
| 100 | 500 | 500 | 375 | 250 | 125 | 50 | 0 |
| 80 | 500 | 375 | 250 | 125 | 50 | 25 | 0 |
| 60 | 375 | 250 | 125 | 50 | 25 | 5 | 0 |
| 40 | 250 | 125 | 50 | 25 | 5 | 5 | 0 |
| 20 | 125 | 50 | 25 | 5 | 5 | 5 | 0 |
| 5 | 50 | 25 | 5 | 5 | 5 | 5 | 0 |

## SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

| Travel Distance Category (miles) | Pop. | Number of people within the travel distance category | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,001 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | |
| Greater than 0 to $\frac{1}{4}$ | | 0 | 0.1 | 0.4 | 1.0 | 4 | 13 | 41 | 130 | 408 | 1,303 | 4,081 | 13,034 | 1 |
| Greater than $\frac{1}{4}$ to $\frac{1}{2}$ | | 0 | 0.05 | 0.2 | 0.7 | 2 | 7 | 20 | 65 | 204 | 652 | 2,041 | 6,517 | 2 |
| Greater than $\frac{1}{2}$ to 1 | | 0 | 0.02 | 0.1 | 0.3 | 1 | 3 | 10 | 33 | 102 | 326 | 1,020 | 3,258 | 3 |

Reference(s) 1,3,4

Sum = 6

# SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS

| | |
|---|---|
| 10. Assign the hazardous waste quantity score calculated for soil exposure | 10 |
| 11. Assign the highest toxicity value from SI Table 16 | 1,000 |
| 12. Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: | WC = 10 |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

RESIDENT POPULATION THREAT SCORE:

(Likelihood of Exposure, Question 1; Targets = Sum of Questions 2, 3, 4, 5, 6) $\frac{LE \times T \times WC}{82,500}$ **0**

NEARBY POPULATION THREAT SCORE:

(Likelihood of Exposure, Question 7; Targets = Sum of Questions 8, 9) $\frac{LE \times T \times WC}{82,500}$ **0.04**

SOIL EXPOSURE PATHWAY SCORE:
Resident Population Threat + Nearby Population Threat

**0.04**
(Maximum of 100)

## AIR PATHWAY

### Air Pathway Observed Substances Summary Table

On SI Table 21, list the hazardous substances detected in air samples of a release from the site. Include only those substances with concentrations significantly greater than background levels. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For NAAQS/NESHAPS benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate targets in the distance category from which the sample was taken and any closer distance categories as Level I. If the percentages are less than 100% or all are N/A, evaluate targets in that distance category and any closer distance categories that are not Level I as Level II.

## SI TABLE 21: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References _____

| Hazardous Substance | Conc. (µg/m³) | Gaseous Particulate | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References _____

| Hazardous Substance | Conc. (µg/m³) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References _____

| Hazardous Substance | Conc. (µg/m³) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# AIR PATHWAY WORKSHEET

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to air, assign a score of 550. Record observed release substances on SI Table 21. | 0 | | |
| 2. POTENTIAL TO RELEASE: If sampling data do not support a release to air, assign a score of 500. Optionally, evaluate air migration gaseous and particulate potential to release (HRS Section 6.1.2). | 300 | E | 1 |
| LR = | 300 | | |

| TARGETS | | | |
|---|---|---|---|
| 3. ACTUAL CONTAMINATION POPULATION: Determine the number of people within the target distance limit subject to exposure from a release of a hazardous substance to the air.<br>a) Level I: _____ people x 10 = _____<br>b) Level II: _____ people x 1 = _____ Total = | 0 | H | 1 |
| 4. POTENTIAL TARGET POPULATION: Determine the number of people within the target distance limit not subject to exposure from a release of a hazardous substance to the air, and assign the total population score from SI Table 22. Sum the values and multiply the sum by 0.1. | 1.3 | E/H | 3,4 |
| 5. NEAREST INDIVIDUAL: Assign a score of 50 if there are any Level I targets. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Population exists, assign the Nearest Individual score from SI Table 22. | 20 | H | 4 |
| 6. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (SI Table 13) and wetland acreage values (SI Table 23) for environments subject to exposure from the release of a hazardous substance to the air. | 0 | | |
| 7. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release. | 0.24 | | |
| 8. RESOURCES: Assign a score of 5 if one or more air resources apply within 1/2 mile of a source; assign a 0 if none applies.<br>• Commercial agriculture<br>• Commercial silviculture<br>• Major or designated recreation area | 0 | E/H | 1 |
| T = | 21.54 | | |

| *Sensitive Environment Type* | *Value* |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

| *Wetland Acreage* | *Value* |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

**150 x 0.016**

## SI TABLE 22 (From HRS TABLE 6-17): VALUES FOR POTENTIAL CONTAMINATION AIR TARGET POPULATIONS

| Distance from Site | Pop. | Nearest Individual (choose highest) | Number of People within the Distance Category | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | |
| On a source | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | 0 |
| 0 to $\frac{1}{4}$ mile | X | * | 1 | 4 | 13 | 41 | 131 | 408 | 1,304 | 4,081 | 13,034 | 40,812 | 130,340 | 408,114 | 4 |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | | 2 | 0.2 | 0.9 | 3 | 9 | 28 | 88 | 282 | 882 | 2,815 | 8,815 | 28,153 | 88,153 | 3 |
| > $\frac{1}{2}$ to 1 mile | | 1 | 0.06 | 0.3 | 0.9 | 3 | 8 | 26 | 83 | 261 | 834 | 2,612 | 8,342 | 26,119 | 3 |
| > 1 to 2 miles | | 0 | 0.02 | 0.09 | 0.3 | 0.8 | 3 | 8 | 27 | 83 | 266 | 833 | 2,659 | 8,326 | 3 |
| > 2 to 3 miles | | 0 | 0.009 | 0.04 | 0.1 | 0.4 | 1 | 4 | 12 | 38 | 120 | 375 | 1,199 | 3,755 | 0 |
| >3 to 4 miles | | 0 | 0.005 | 0.02 | 0.07 | 0.2 | 0.7 | 2 | 7 | 28 | 73 | 229 | 730 | 2,285 | 0 |
| | Nearest Individual = | 20 | | | | | | | | | | | | Sum = | 13 |

References 1, 3, 4

* Score = 20 if the Nearest Individual is within $\frac{1}{8}$ mile of a source; score = 7 if the Nearest Individual is between $\frac{1}{8}$ and $\frac{1}{4}$ mile of a source.

## SI TABLE 23 (HRS TABLE 6-18): AIR PATHWAY VALUES FOR WETLAND AREA

| Wetland Area | Assigned Value |
|---|---|
| < 1 acre | 0 |
| 1 to 50 acres | 25 |
| > 50 to 100 acres | 75 |
| > 100 to 150 acres | 125 |
| > 150 to 200 acres | 175 |
| > 200 to 300 acres | 250 |
| > 300 to 400 acres | 350 |
| > 400 to 500 acres | 450 |
| > 500 acres | 500 |

## SI TABLE 24: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS

| Distance | Distance Weight | Sensitive Environment Type and Value (from SI Tables 13 and 20) | | Product |
|---|---|---|---|---|
| On a Source | 0.10 | x | | |
| | | x | | |
| 0 to 1/4 mile | 0.025 | x | | |
| | | x | | |
| | | x | | |
| 1/4 to 1/2 mile | 0.0054 | x | | |
| | | x | | |
| | | x | | |
| 1/2 to 1 mile | 0.0016 | x | Alligator 75 | 1.2 |
| | | x | Snake 75 | 1.2 |
| | | x | | |
| 1 to 2 miles | 0.0005 | x | | |
| | | x | | |
| | | x | | |
| 2 to 3 miles | 0.00023 | x | | |
| | | x | | |
| | | x | | |
| 3 to 4 miles | 0.00014 | x | | |
| | | x | | |
| | | x | | |
| > 4 miles | 0 | x | | |

Total Environments Score = 2.4

## AIR PATHWAY (concluded)

WASTE CHARACTERISTICS

| | |
|---|---|
| 9. If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculated HWQ score for sources available to air migration. | 10 |
| 10. Assign the highest air toxicity/mobility value from SI Table 21. | 2 |
| 11. Multiply the air pathway toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: | WC = 2 |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

AIR PATHWAY SCORE: $\frac{LE \times T \times WC}{82,500}$ **0.16** (maximum of 100)

| SITE SCORE CALCULATION | S | $S^2$ |
|---|---|---|
| GROUND WATER PATHWAY SCORE ($S_{GW}$) | 0.4 | 0.16 |
| SURFACE WATER PATHWAY SCORE ($S_{SW}$) | 0.3 | 0.9 |
| SOIL EXPOSURE ($S_S$) | 0.04 | 0.016 |
| AIR PATHWAY SCORE ($S_A$) | 0.16 | 0.03 |
| SITE SCORE $\sqrt{\frac{S_{GW}^2+S_{SW}^2+S_S^2+S_A^2}{4}}$ = | | 0.52 |

COMMENTS

- The groundwater to surface water pathway was not scored due to the depth of the aquifer and the low groundwater pathway score.
- A flood frequency of 1:100 was assumed due to the lack of published flood information.

# OVERSIZED

# DOCUMENT

Trip-Report - Woolfolk Chemical Co. Warehouse, Lenox

Ron Dobbs,
On-Scene Coordinator

Henry Hudson,
Chief, Site Control Unit

A hazardous waste site inspection was performed on 4/5/85 at the above referenced facility. The Woolfolk Chemical Company. warehouse was inspected upon Mr. Moein's request. The hazardous waste site in concern is a vacant warehouse located in a residential area within the city of Lenox. The warehouse which was leased to Woolfolk Chemical Co. had stored agricultural herbicides and pesticides prior to a fire in July of 1981. As a result of the fire, firefighting runoff water contaminated with pesticides (toxaphene and chlordane) had entered the soil around the warehouse.

The subsequent cleanup of the warehouse was performed by O & H Materials under contract by Woolfolk Chemical Co. The cleanup effort involved: removing the stored pesticides, removing contaminated insulation on the walls and roof, decontaminating the concrete floor with high pressure water sprayers, collection and treatment of the contaminated water by carbon adsorption.

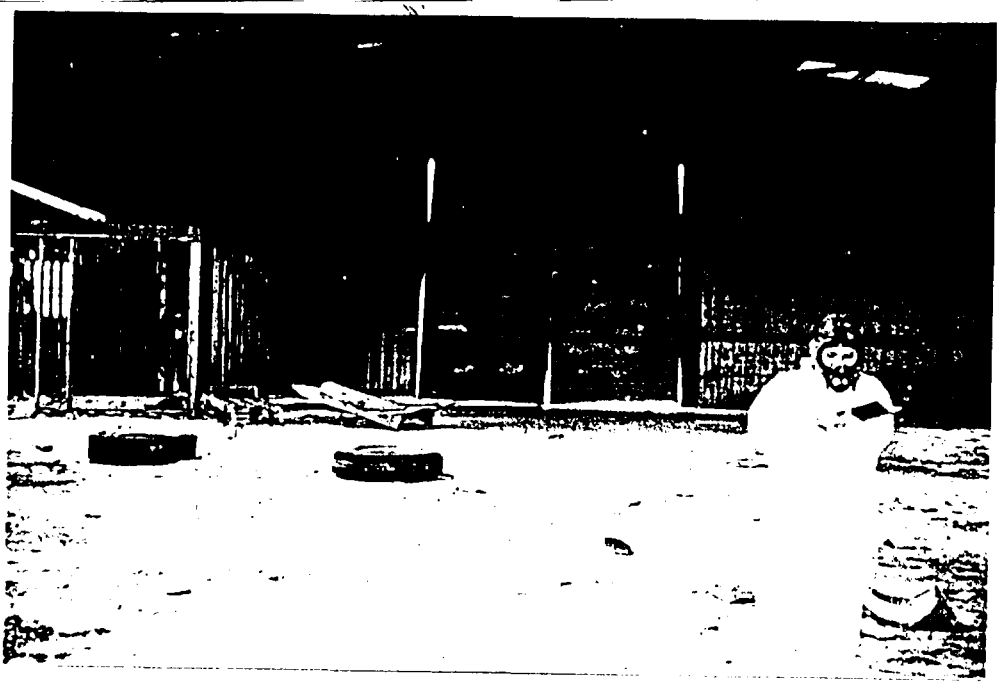
Georgia EPD performed a site inspection on 3/14/84. Three soil samples were taken, the results and locations of which are shown on the attached map.

Our involvement came about when Mr. James Lindsey called the emergency spills number on 3/21/85 requesting our participation. I inspected the warehouse with Sue Coker (T.A.T.) and Robert Lindsey (owner of the warehouse). After the inspection I discussed with Mr. Lindsey EPA's role in cleaning up hazardous waste sites. I informed Mr. Lindsey that this particular site does not pose an immediate threat to human health and to the environment and would be evaluated by the Hazard Ranking System.

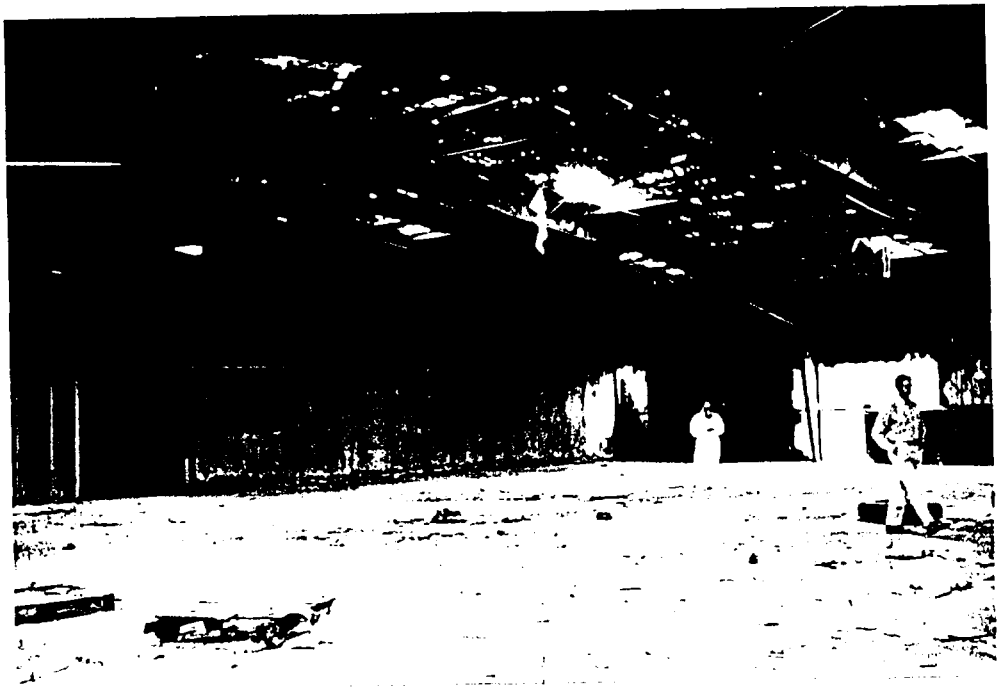
Tom Westbrook of Georgia EPD has informed me on 4/19/85 that Woolfolk Chemical Co. will be confirming their proposal for work within two weeks, therefore no action by ERRB will be necessary.

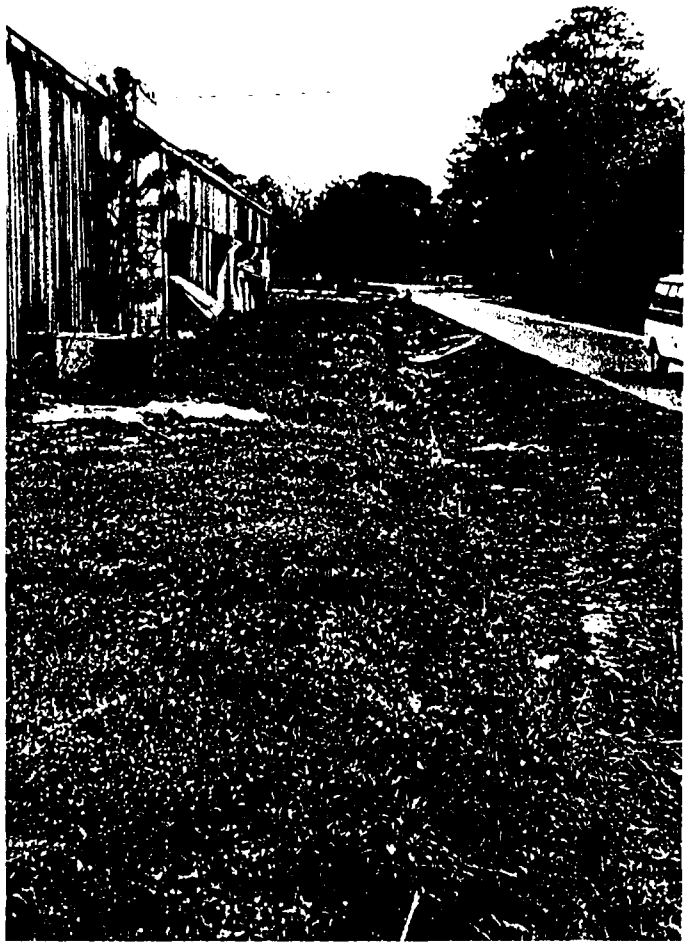
Woolfolk Chemical Co. warehouse.

Backview facing south.Warehouse is located in a residential area within the city limits.

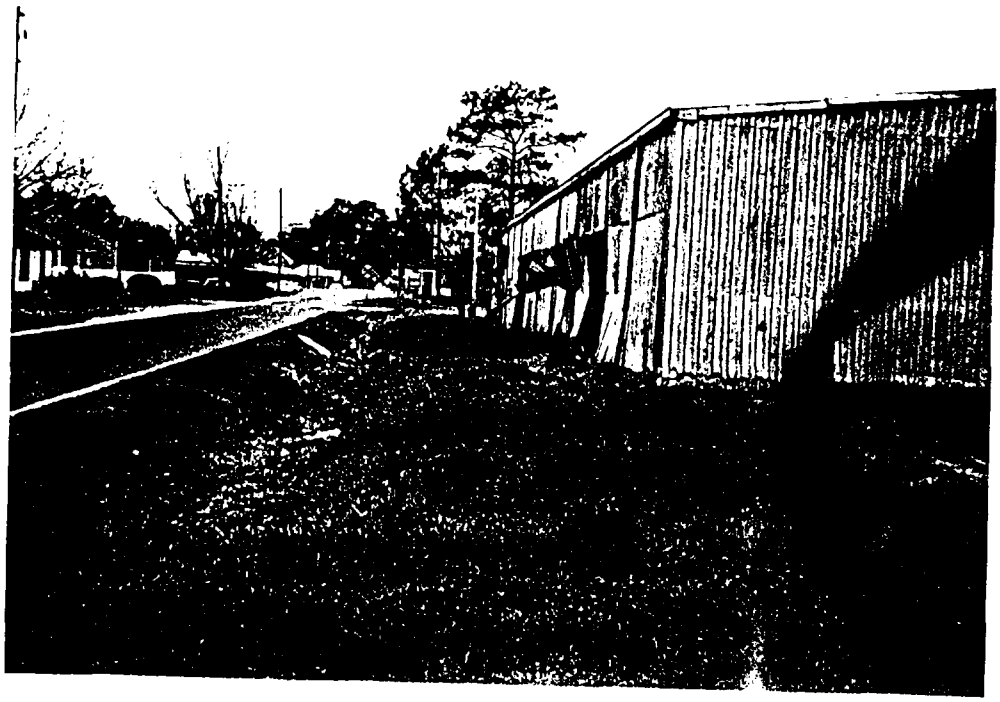


Views inside warehouse, all stored chemicals and contaminated materials inside the warehouse were removed. Contaminated insulation on the roof and walls were removed also. Work was performed by O&H Materials.





Ditch along southside of warehouse. Firefighting runoff water entered this ditch during fire in 7/81. water samples taken in 1981 indicated 10-263 ppm Toxaphene was present.



Reference 3

[redacted]

[redacted]K CHEMICAL-LENNOX
[redacted]TUDE 31:16:17 LONGITUDE 83:27:45 1983 POPULATION

| KM | 0.00-.400 | .400-.810 | .810-1.60 | 1.60-3.20 | 3.20-4.80 | 4.80-6.40 | SECTOR TOTALS |
|---|---|---|---|---|---|---|---|
| S 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 8 | 0 | 0 | 0 | 891 | 0 | 0 | 891 |
| RING TOTALS | 0 | 0 | 0 | 891 | 0 | 0 | 891 |

```
press RETURN to continue
MENU: Geodata Handling Data List procedures
[redacted]ete[redacted]esame(in parentheses)          ([redacted])
or a command: HELP, HELP option, BACK, CLEAR, EXIT, TUTOR
GEMS> exit

Type YES to confirm the EXIT command; type NO to restart GEMS
GEMS> yes
$ logout
 HTW          logged out at 28-APR-1994 11:29:06.29
 Itemized resource charges, for this session, follow:

NODE: VAXTM1
ACCT: 9040                          START TIME:     28-APR-1994 11:27:44.60
PROJ: GEMS0001                      FINISH TIME:    28-APR-1994 11:29:06.29
USER: HTW                           BILLING PERIOD:940401
UIC:  [000710,000012]               WEEKDAY:        THURSDAY
BAUD:                               TERMINAL PORT:  VTA649

DESCRIPTION OF CHARGE                QUANTITY                EXPENDITURE
-------------------------------------------------------------------------

  ALL CHARGE LEVELS
    300  baud            (Seconds)          82                    0.0000
    CPU TIME             (Seconds)          3                    0.6983
                                                              -----------
    TOTAL FOR THIS SESSION                                  $    0.6983

** Note:  This total reflects the charges for this process only,
          subprocesses created during this session are accounted for
          separately
CLR PAD
J4~
NO CARRIER
```

Reference 5

BLACK & VEATCH Waste Science, Inc.

TELEPHONE MEMORANDUM

ARCS IV
Lennox Warehouse - Woolfolk Chemicals
Fishing, Floods

BVWS Project 52012.429
BVWS File D.2
May 5, 1994
1:00 p.m.

From: Dan Holder
Company: Georgia Dept. Fish and Wildlife
Phone No.: (912) 285-6094

Recorded by: Jon Erskine

I asked Mr. Holder about fishing on Brushy Creek and the New-River. He said that they do not have use figures, but he estimates that there are no major fisheries in that area. Drainage is too small, not enough water to support a fishery. Most of this area is under private control. Also, the creeks are of intermittent drainage.

Reference 1

# SITE INVESTIGATION REPORT

# WOOLFOLK CHEMICAL WORKS - LENOX WAREHOUSE

# LENOX, GEORGIA

# GAD082832841

Jeffrey M. Williams
Remedial Action Unit
Georgia Environmental Protection Division
February 1985

WOOLFOLK CHEMICAL WORKS - LENOX WAREHOUSE

SITE INVESTIGATION REPORT

TABLE OF CONTENTS


1.0 Executive Summary.....1

2.0 Background.....3

2.1 Location.....3
2.2 Site Layout.....3
2.3 Ownership History.....3
2.4 Site Use History.....3
2.5 Permit and Regulatory History.....4
2.6 Remedial Actions to Date.....4
2.7 Summary Trip Report.....5

3.0 Environmental Setting.....6

3.1 Topography.....6
3.2 Surface Waters.....6
3.3 Geology and Soils.....6
3.4 Ground Water.....7
3.5 Climate and Meteorology.....8
3.6 Land Use.....8
3.7 Population Distribution.....8
3.8 Water Supply.....8
3.9 Critical Environments.....9

4.0 Waste Types and Quantities.....10

4.1 Waste Quantities.....10
4.2 Waste Disposal Methods and Locations.....10
4.3 Waste Types.....10

5.0 Laboratory Data.....11

5.1 Summary.....11
5.2 Quality Assurance Review.....11

6.0 Toxicology/Chemical Characteristics.....12

WOOLFOLK CHEMICAL WORKS - LENOX WAREHOUSE

SITE INVESTIGATION REPORT

LIST OF FIGURES AND APPENDICES

Figure 1: Site Location.....13

Figure 2: Sample Location Areas.....14

Figure 3: Soil Profile of Site Area.....15

Figure 4: Cook County Map.....16

Table 3.1: Groundwater Quality for City of Adel.....17

Appendix A: Photographs.....18

Appendix B: Laboratory Data.....23

Appendix C: References.....26

Appendix D: Site Inspection Form 2070-13.....27

Appendix E: Inventory Report - Woolfolk Chemicals - Lenox Warehouse.....41

## 1.0 EXECUTIVE SUMMARY

Woolfolk Chemicals - Lenox Warehouse is located in Lenox, Georgia and is composed of 1½ acres of land approximately 1 mile west of Brushy Creek. The warehouse had been a distribution point for a wide variety herbicide and pesticide products from 1976 to 1981 (Appendix E).

In July 1981, a chemical fire at the facility prompted Georgia EPD personnel to respond and supervise the cleanup of the residual materials. Subsequent remedial action by the company removed damaged materials which were transported to a disposal facility in Emelle, Alabama. The owner of the site, Mr. Bobby Lindsey, requested EPD officials to investigate the initial remedial actions at the site.

On August 8, 1984, a site inspection was conducted by Thomas M. Westbrook of the Georgia EPD. A total of four soil samples were collected from areas surrounding the warehouse that were known to receive contaminated wash water from the 1981 chemical fire (Figure 2).

Analysis of the soil samples indicates that there are no leachable contaminants present and the samples are not considered hazardous from the stand point of EP toxicity for toxaphene. Toxaphene values (total concentrations, reported as ppm (mg/kg) dry weight of soil) indicate the presence of this substance in the local environment.

The entire site is located in a residential urban setting with residences present on 3 adjacent sides of the warehouse property. Public access to the site is unrestricted. Surface run-off appears to be the only pathway for contamination to spread, although the extent of contamination is unknown. It is therefore suggested that an assessment study be proposed and implemented to properly evaluate the migration potential of contaminants off the site.

## 2.0 BACKGROUND

### 2.1 Location

Woolfolk Chemical - Lenox Warehouse is located at the intersection of Rentz Avenue and East Colquitt Street, Lenox, Georgia. The site is at latitude 31° 16' 17.0" N and longitude 83° 27' 45.0" W on the Lenox quadrangle 7.5 minute series, USGS map (Figure 1).

### 2.2 Site Layout

The site consists of a 1½ acre tract of land located within the city of Lenox, Georgia, in a residential area. The warehouse building on the site is bordered on the south and east by drainage ditches (Figure 2). Access to the front of the warehouse is from Rentz Avenue.

### 2.3 Ownership History

The facility was originally owned by Mr. D. L. Harpe of Tifton, Georgia. In 1973, the facility was purchased by Bobby Lindsey, who used the facility for a cotton warehouse operation. In the spring of 1976, Mr. Lindsey leased the warehouse building to Woolfolk Chemical Works, Inc. From 1976 to 1981, Woolfolk used the warehouse as a distribution and storage facility for a wide variety of herbicide and pesticide (Agricultural) products. Mr. Lindsey was also employed with Woolfolk Chemical Works from 1976 to 1981.

### 2.4 Site Use History

As stated in section 2.3, from the spring of 1976 to July 1981, the facility was used to store various pesticide and herbicide products.

A fire occurred at the facility on July 1, 1981 after which all wastes were shipped to Chemical Waste Management, Emelle, Alabama, and all salvageable products were removed from the building. No products were subsequently stored on the property.

## 2.5 Permit Regulatory History

Woolfolk Chemicals - Lenox Warehouse has never been required to obtain a permit for the storage of agrichemical products. This facility was a distribution point for Woolfolk Chemicals agricultural products.

## 2.6 Remedial Actions to Date

Personnel from the Georgia Environmental Protection Division first visited the facility in July 1981 in response to a chemical fire on July 1, 1981. A quantity of water used to fight the fire carried some chemicals down a city drainage ditch approximately 0.3 miles from the warehouse. Woolfolk Chemical Works, Inc. contracted with O. H. Materials Company to clean up the chemical spill in the warehouse floor and in the ditches surrounding the warehouse. Wash waters were analyzed before and after filtration to ensure no (future) contamination of soil and water downstream from the facility. On July 31, 1981, approximately 200 cubic yards of residual materials from the Lenox Warehouse fire were shipped to Chemical Waste Management in Emelle, Alabama. The fire fighting waters were treated to remove excessive amounts of toxaphene; however, ditch soils and soils around the building may still be contaminated with residual toxaphene concentrations.

## 2.7 Summary Trip Report

On July 1, 1981, Larry Rogers of the Southwest Georgia Region EPD investigated a chemical fire at the Woolfolk Chemical Works, Inc., Lenox, Georgia. Four samples of the runoff waters from the fire were analyzed for toxaphene and parathion. Ed Cook from the Georgia EPD Emergency Response Team delivered the samples to the GA EPD lab in Atlanta on July 6, 1981 (Appendix B). On July 1, 1981, O. H. Materials Company was contracted for cleanup of approximately 3,000 gallons of contaminated water.

On July 6, 1984, Jennifer Kaduck of the Georgia EPD Facilities Compliance Unit reviewed the files on the cleanup activities at the subject site. The record does not indicate if the warehouse and surrounding soils were ever reinspected to ensure that all wastes were removed. On August 8, 1984, Thomas Westbrook of the Georgia EPD Remedial Action Unit was instructed to inspect and sample the soil areas that may contain high levels of toxaphene. Three soil samples were taken: #1 from the back door, #2 from the front door, and #3 from under the crack in the cement foundation (Appendix A, Photograph 2).

## 3.0 ENVIRONMENTAL SETTING

### 3.1 Topography

Woolfolk Chemicals - Lenox Warehouse is located in the southern central coastal plain area of Georgia. The site is located approximately 1 mile from Brushy Creek at an elevation of 290 feet above mean sea level. Numerous ponds and streams are prevalent throughout the county as a result of the poorly drained plateaus and low lying plains[1] (Figure 1).

The terrain at the site is nearly level. The site is bordered on the south and east sides by storm drainage ditches that are adjacent to the warehouse building (Figure 2). These ditches merge at the southeast corner of the site where they eventually drain some residential sections of the city.

### 3.2 Surface Waters

The New and Withlacoochee Rivers form the eastern boundary of Cook County and the Little River forms the western boundary. Brushy Creek is the closest surface water body near the site (Figure 1). There are no upstream contributing waters or downstream receiving waters near the site. There is presently no information available in reference to the flood potential of the area. There is no stream classification and surface water quality data for Cook County.

### 3.3 Geology and Soils

Soil at the facility is represented by the Leefield series, which consists of somewhat poorly drained soils that have formed in thick beds of loamy material on low uplands.[1]

Soils at the site are low in natural fertility and are very strongly acid throughout.[1] Permeability is moderately slow. The Leefield loamy sand is the dominant soil type at the site and represents a somewhat poorly drained soil. The soils are derived mainly from the Hawthorne Formation, a geologic sedimentary deposit laid down in Miocene times. Cook County has flat terrain, and consequently has extensive ponds and bay areas that result in poor drainage. Top soil is sandy to a depth of 6 inches with a seasonal high water table that is 15 to 30 inches for 2 to 4 months of the year.[1] Loamy sand is found from 0-26 inches, sandy loam from 26-31 inches and sandy clay loam from 31-65 inches.[1] Sand, clay, and limestones of the Miocene age are found at depths from 25 to 400 feet. From 400 to 500 feet - the Ocala limestone occurs and is used as the main water bearing unit for the city of Lenox.[2]

### 3.4 Ground Water

The primary source of water for the Lenox, Georgia area is the principal artesian aquifer. The city of Lenox has two deep water wells that provide drinking water for approximately 966 people.[3] The main water bearing zone consists of the Ocala Limestone and undifferentiated limestones of the Oligocene age.[4] The overlying Miocene series consists of sediments that contain mostly sand and clay with limestone occuring at about 350 feet below land surface. Thickness of the Ocala Limestone at the site is about 173 feet and yields approximately 250 gallons per minute for each of the two municipal deep water wells. Increased precipitation and stream flow in winter and early spring cause high ground water levels. Decreased precipitation and increased evapotranspiration in summer and autumn result in low stream flow and low groundwater levels.[5]

Ground water quality for the city of Adel is given in Table 3.1. Direction of flow is generally south to southeast for the ground water in the principal artesian aquifer.

3.5 Climate and Meteorology

The climate of Cook County and the Lenox area is characterized by hot humid summers and mild winters. The average annual rainfall is almost 50 inches. The main climatic influences are the latitude, and the warm waters of the Gulf of Mexico. Fall has less rain and wind than spring with average annual temperature of 67°F.[1]

3.6

Land Use

The site is located within the city limits of Lenox in a residential urban setting. U.S. Census statistics in 1969 estimated 70 percent of Cook County was used for farming. Land usage is generally restricted to agricultural products but industry is gaining importance.[1]

3.7

About 55 percent of the population is rural in Cook County. The population within the town of Lenox is 965. The number of residents in the town that use the ground water from the two city wells is 965.[3]

3.8 Water Supply

All drinking water within the city of Lenox is pumped from two municipal wells that penetrate the principal artesian aquifer. One well is located at the

intersection of Gray Street and Haze Road and the second well is on Broad Street in the city of Lenox (Figure 1). Approximately 90,000 gallons per day or 32,850,000 gallons per year are metered by the city of Lenox.[3]

### 3.9 Critical Environments

The site is located within 1 mile of Brushy Creek. This creek is the closest body of water to the subject site. There is an extensive floodplain area approximately 4½ to 5 miles east of the site on the New River (Figure 3). There are numerous small fresh water ponds and bays south of the site. Drainage at the site is poor and generally follows a southeasterly course toward Brushy Creek. Contamination of the creek area has not taken place in previous spills around the site due to the poor drainage at the site. The alluvial floodplains of the New River are habitats for the American Alligator and Indigo Snake, both on the Federal Endangered Species List.[5-6]

## 4.0 WASTE TYPES AND QUANTITIES

### 4.1 Waste Quantities

From 1976 to July 1981, Lenox - Woolfolk Chemical Warehouse operated a warehouse distribution center for agrichemical products. A complete inventory of products before the July 1, 1981 fire is listed in Appendix E. No waste was ever generated at the site. There was however a chemical fire on July 1, 1981 in which a release into the environment was observed. Soils surrounding the warehouse building were sampled by Georgia EPD personnel in August 1984 and determined to contain high levels of the compound toxaphene (Appendix B). The quantity of contaminated soil at the site has not been estimated because the extent of contamination is unknown.

### 4.2 Waste Disposal Methods and Locations

All waste waters used in fighting the July 1981 fire were decontaminated by a carbon filtration process. Elevated levels of toxaphene were found in soils at the entrance and exit of the warehouse building (Figure 1).

### 4.3 Waste Types

Georgia EPD lab analyses of the soils around the site revealed excessive quantities of the pesticide toxaphene. Appendix E lists the types of compounds present in the warehouse before the July 1981 fire.

## 5.0 LABORATORY DATA

### 5.1 Summary

On August 8, 1984, Thomas M. Westbrook of the Georgia EPD Remedial Action Unit, took three soil samples at the subject site (Figure 2). Toxaphene was the only parameter reported because the high concentrations masked the identification of other constituents. The toxaphene found in the three samples was evaluated for its leachability into water. There is a maximum EP concentration limit of 500 ppb (ug/L) for toxaphene. According to the August 8, 1984 lab report the samples are not considered hazardous from the standpoint of EP toxicity for toxaphene.

Toxaphene values were also reported as ppm or mg/kg of dry weight of soil. These values represent "total" concentrations. According to CERCLA and the lab analysis it is believed that a reportable quantity of substance has been released into the environment.

### 5.2 Quality Assurance Review

All samples were collected and placed in clean mason jars with an aluminum foil seal inside the lid. All samples were placed on ice until delivery to the EPD lab. EPD lab is covered by an approved QA document.

## 6.0 TOXICOLOGICAL/CHEMICAL CHARACTERISTICS

From the four soil samples collected on August 8, 1984, the following substance has been identified at the site:

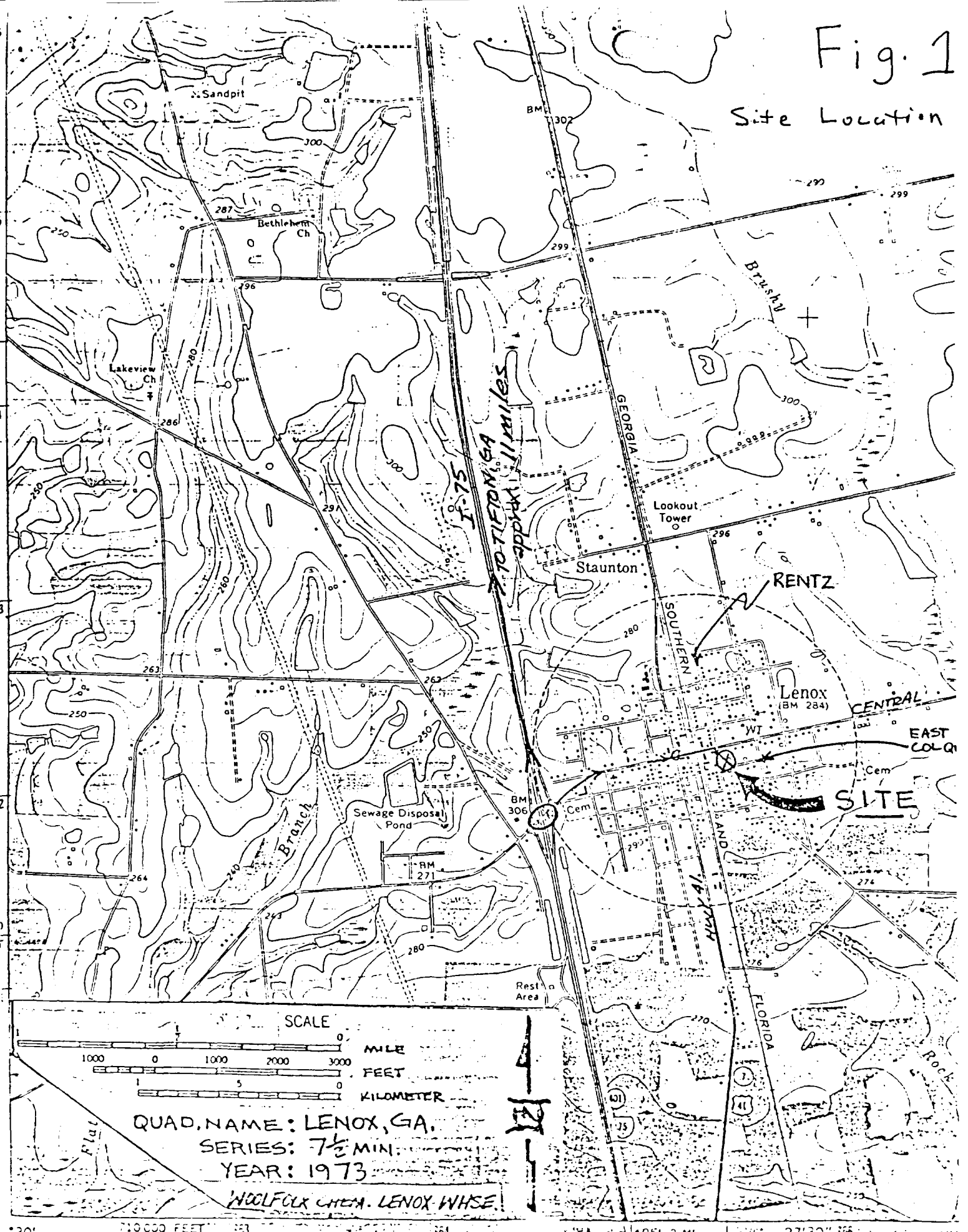
Toxaphene - $C_{10}H_{10}Cl_8$ - an amber, waxy solid with a mild odor of chlorine and camphor. Toxic by ingestion, inhalation, and skin absorption.

Oral $LD_{<0}$ (human) = 40 mg/kg, Oral $LD_{50}$ (rat) = 60 mg/kg, and Dermal $LD_{50}$ (rat) = 780 mg/kg.

Lethal oral dose for man is estimated at 2-7 g, a toxicity of about four times that of DDT.

Other compounds that are expected, but not confirmed, to be present at the site are chlordane, parathion, and lindane.

All toxicological data is taken from references 7 and 8.






Mapped, edited, and published by the Geological Survey

Control by USGS, NOS/NOAA, and Georgia Geodetic Survey

Fig. 2

Sample Location Areas

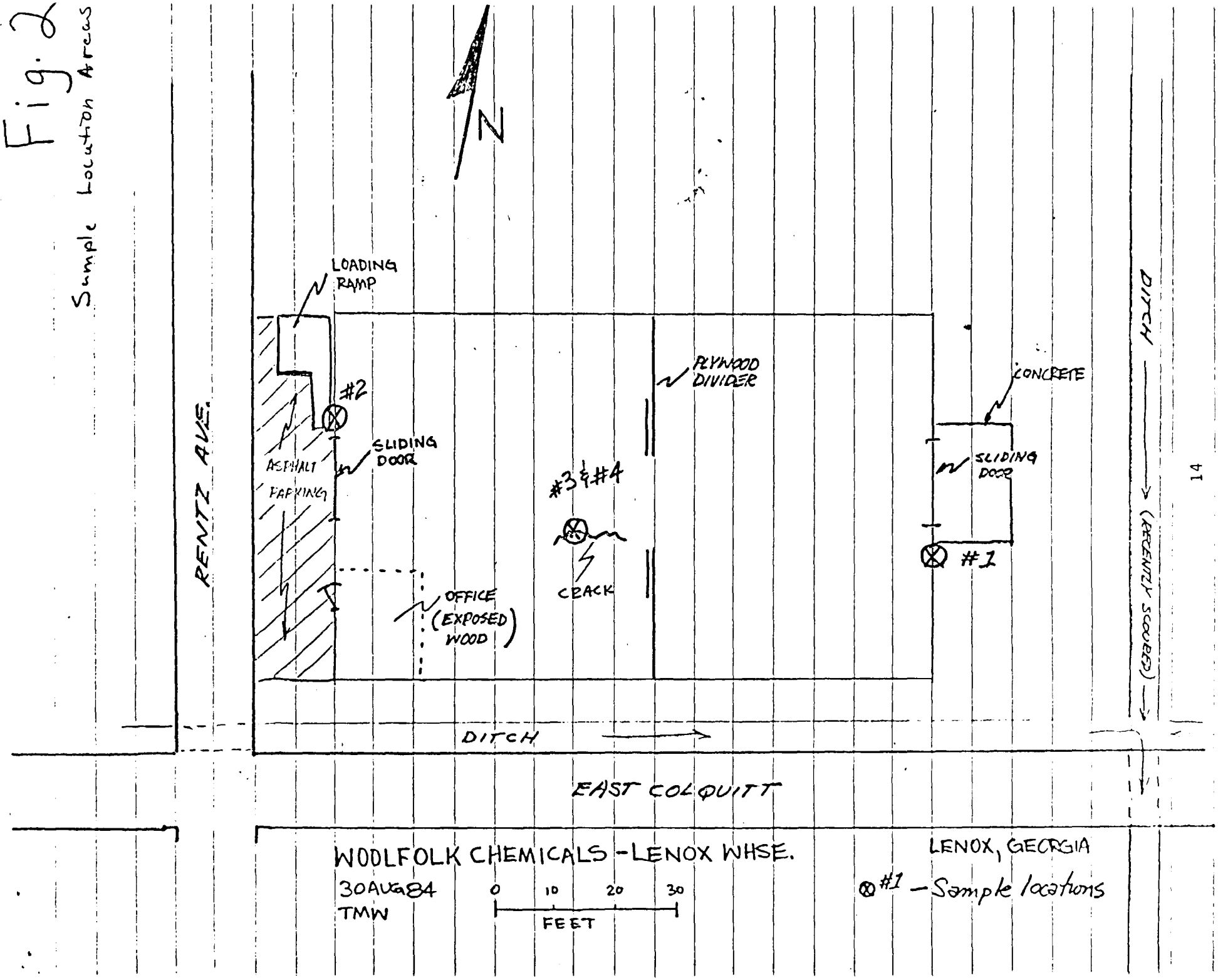


Fig 3

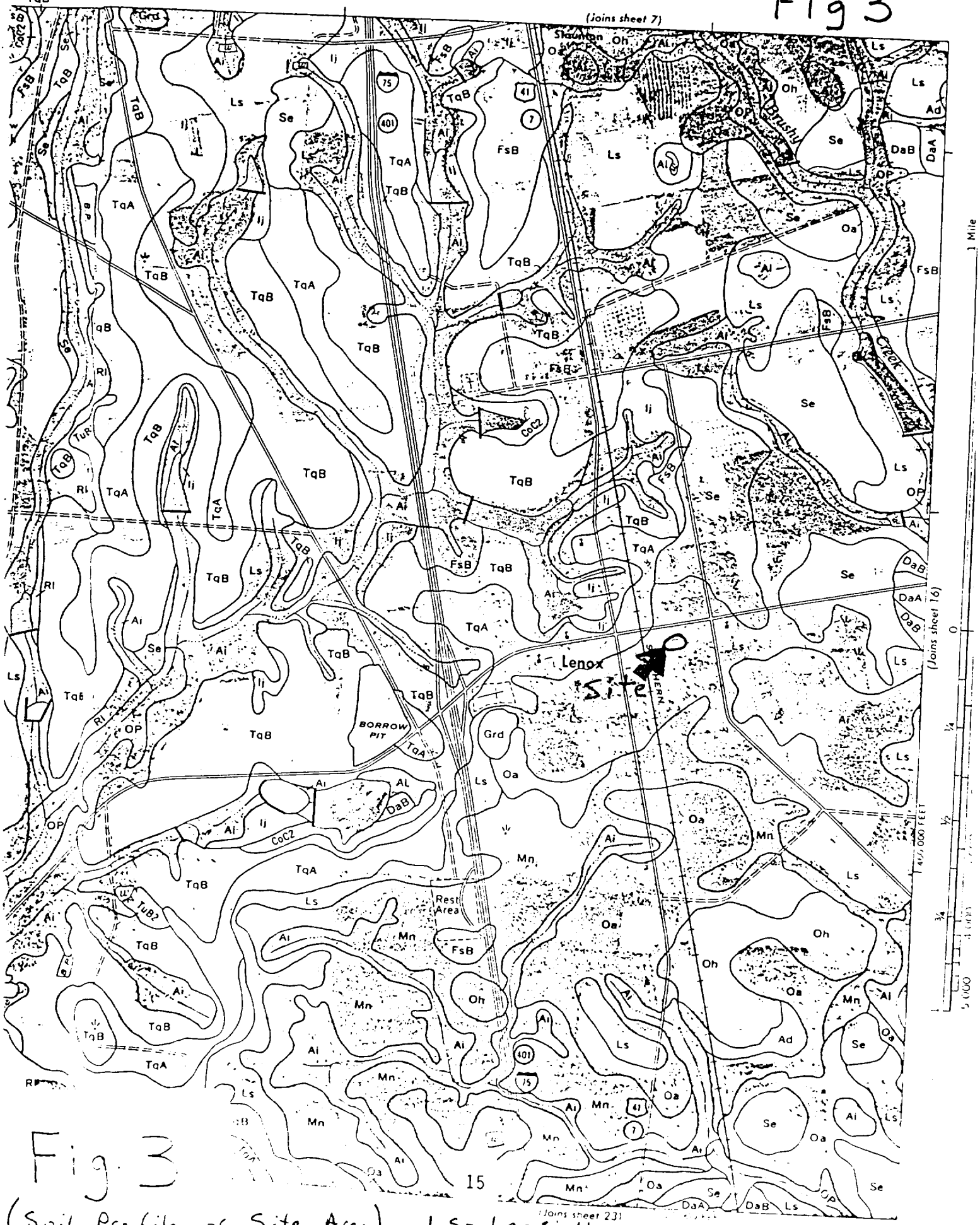



Fig. 3



(Soil Profile of Site Area) LS- Leefield Series

# INDEX TO MAP SHEETS
## COLQUITT AND COOK COUNTIES, GEORGIA

Scale 1:253,440

1 0 1 2 3 4 Miles

Fig. L

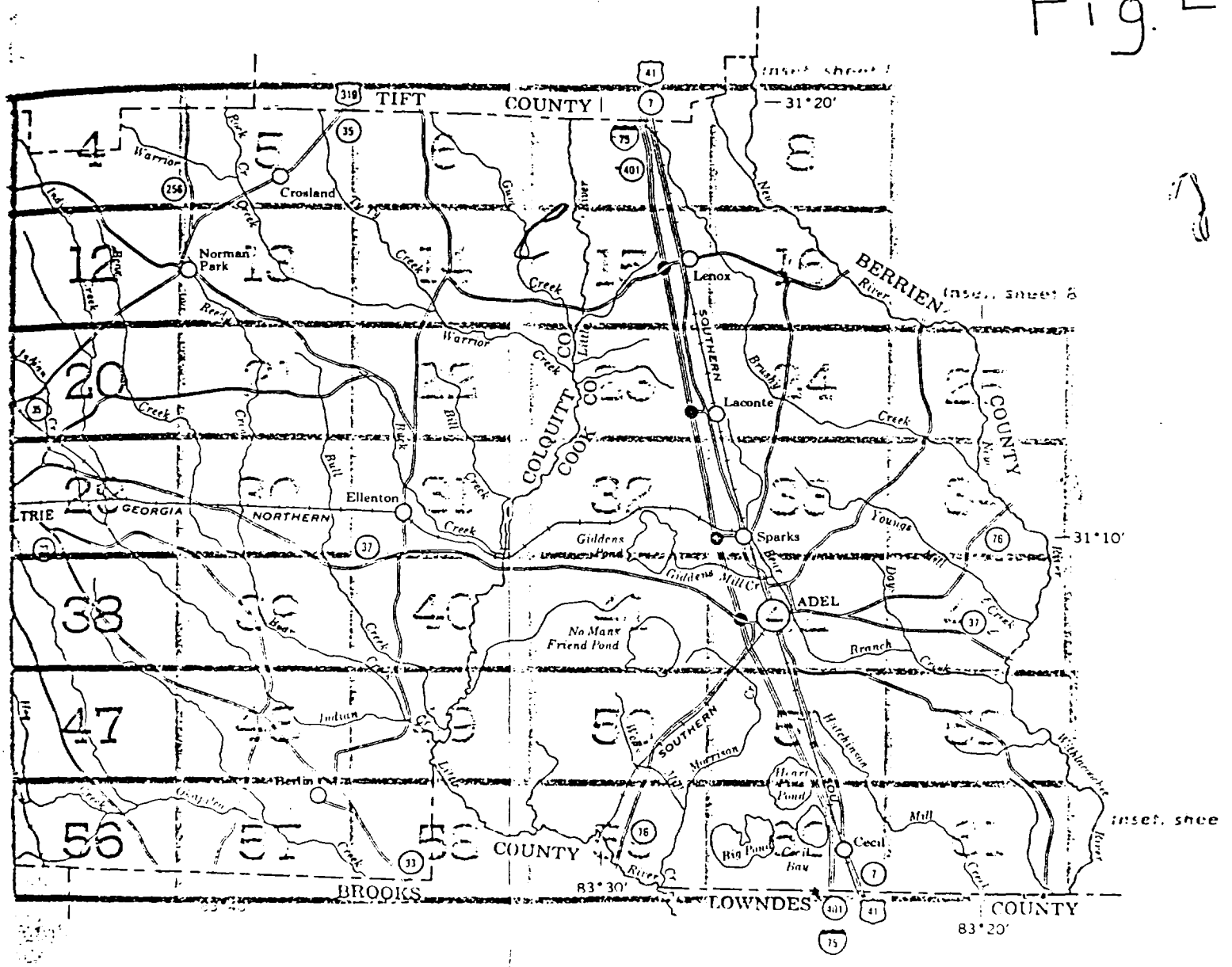


Table 3.1

Location: Adel, Cook County
Owner: Municipal
Well No.: City Well 4
Date drilled: June, 1957
Yield: 1,200 gpm

G.G.S. No.: --

Color: 2
Temperature (°F): 71
Date of collection: April 18, 1958

pH: 7.7
Specific conductance (micromhos 25°C): 399

| Constituents | Parts per million | Equivalents per million |
|---|---|---|
| Silica ($SiO_2$) | 33 | |
| Iron (Fe) | .26 | |
| Calcium (Ca) | 53 | 2.64 |
| Magnesium (Mg) | 16 | 1.32 |
| Sodium (Na) | 4.6 | .20 |
| Potassium (K) | 1.4 | .04 |
| Bicarbonate ($HCO_3$) | 144 | 2.36 |
| Carbonate ($CO_3$) | 0 | .00 |
| Sulfate ($SO_4$) | 87 | 1.81 |
| Chloride (Cl) | 4.0 | .11 |
| Fluoride (F) | .3 | .02 |
| Nitrate ($NO_3$) | .1 | .00 |
| Dissolved solids | 289 | |
| Hardness as $CaCO_3$ | | |
| Total . . . . . | . . 198 | |
| Noncarbonate . . . . . | . . 80 | |

| Casing record | | | | | Aquifer |
|---|---|---|---|---|---|
| Size (inches) | From (feet) | To (feet) | Depth of well (feet) | Screen setting (feet) | |
| 16 | 0 | 46 | | | |
| 12 | 46 | 276 | 500 | 276-500 a/ | Ocala limestone |

a/ Open hole in limestone

8AUG84 #1
LENOX

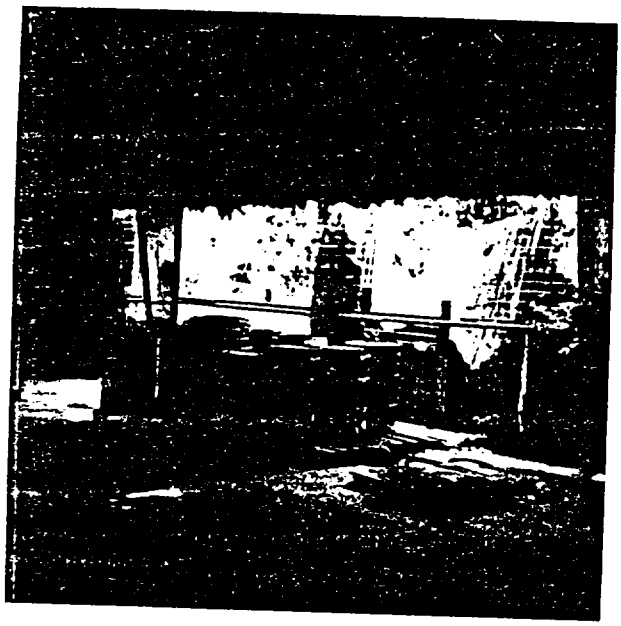
County Name COOK
Picture No 1 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing "E"
Photographer T WESTBROOK
Program 3012
Explanation: INSIDE VIEW OF WOOLFOLK CHEM. - LENOX WHSE

Other:

8 AUG84 #2
LENOX

County Name COOK
Picture No 2 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing "E"
Photographer T. WESTBROOK
Program 3012
Explanation: CLOSE-UP OF CRACK IN CONCRETE FOUNDATION

Other: 1981 FIRE CENTERED IN THIS AREA OF THE WAREHOUSE.



8AUG84 #3
LENOX

County Name COOK
Picture No 3 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing SE
Photographer T. WESTBROOK
Program 3012
Explanation: S.E. CORNER OF WHSE. EMPTY DRUMS (EXCESS) FROM CLEANUP.

Other:

8AUG84 #4
LENOX

County Name COOK
Picture No 4 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing —
Photographer T. WESTBROOK
Program 3012
Explanation: CLOSESUP OF SAMPLE LOCATIONS #3, #4.

Other: NOTE - PLASTIC LINER (FOLDED) UNDER SLAB

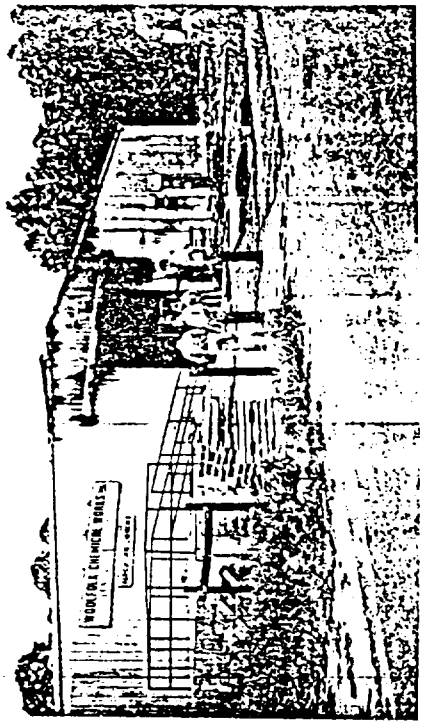
8AUG84 #5
LENOX

County Name COOK
Picture No 5 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing —
Photographer TWESTBROOK
Program 3012
Explanation: 2ND ATTEMPT OF OBTAINING SAME BUT CLEARER PHOTO AS #4

Other:

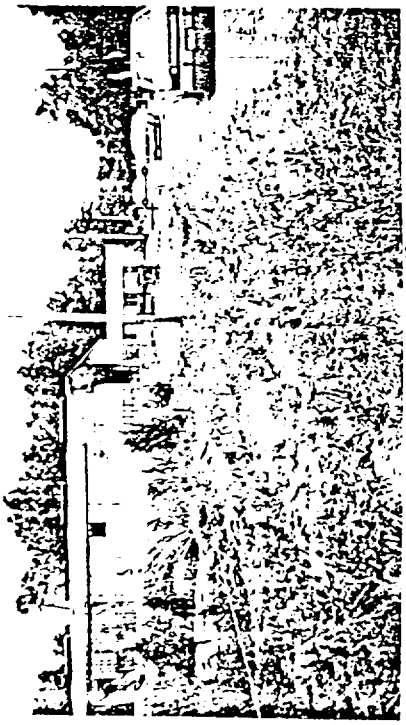
County Name
Picture No of
Site Name
Date Weather
Direction Facing
Photographer
Program
Explanation:

Other:

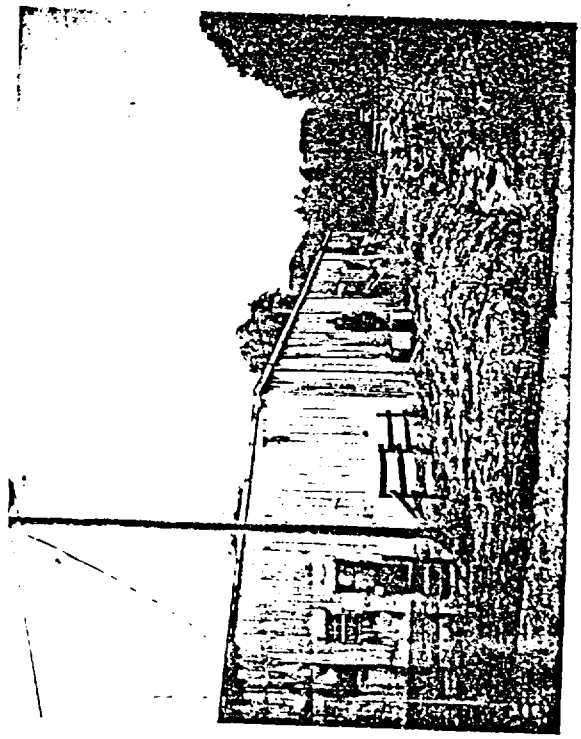



#1

#2



#3



#4

#5

Woolfolk Chem Co
Lenox. 7-1-81
2051 hr
Picture shows building
+ Security Line around area
Larry Rogers #3

POLACOLOR 2 K015251P

7-1-81 10.55
Woolfolk Chem Co Lenox
Front entrance.
taken by Larry Rogers
#1

Lenox, Ga
ditch with water taken with
chemicals.
Larry Rogers #5

POLACOLOR 2 K015251P

7-1-81 11:00 Am.
Woolfolk Chem Co Lenox Ga
Right side of building + ditch
with runoff water
Larry Rogers #4

POLACOLOR 2 K015251P

Woolfolk Chemical Co.
Lenox, Ga.
Back door of building
Water ran out here
during fire + carried
chemicals down into
ditch.
#2 Larry Rogers

Appendix B

# LAND PROTECTION BRANCH
# HAZARDOUS WASTE ANALYSIS REQUEST

DATE: 9AUG84 PROJECT: 3012 PROGRAM WOODFOLK-LENOX W. HSE. COLLECTOR: T. WESTBROOK

NO. SAMPLES: 3 LOG NOS. 924-926 LIQUID ____ SOLID ____ SOIL 3

CAUSTIC ____ ACID ____ SOLVENT ____ UNKNOWN ____ SLUDGE ____

INFORMATION FOUND: File info: Fire in Agchem. warehouse resulted in spillage & mixtures of various pesticides & herbicides with water. Soils outside w. hse. potent. contaminated.

HAZARDOUS WASTE NOS. Toxaphene – CAS 8001-35-2, Parathion - CAS 56-38-2, Chlordane 57

HAZARDOUS HANDLING: assume contaminated - odors were evident

WORK PRIORITY (CRITICAL NEED) NORMAL - ROUTINE - Moderate - LL Project

## METALS ANALYSES

| | TOT | DIS | | |
|---|---|---|---|---|
| METALS (DW NO Hg) | ☐ | ☐ | EP METALS (DW NO Hg) ☐ | 100X ☐ 30X ☐ |
| METALS (DW WITH Hg) | ☐ | ☐ | EP METALS (DW WITH Hg) | EP Toxaphene X |

| | TOT | DIS | | TOT | DIS | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NICKEL | ☐ | ☐ | CADMIUM | ☐ | ☐ | EP NICKEL | ☐ | EP CADMIUM | ☐ |
| ARSENIC | ☐ | ☐ | LEAD | ☐ | ☐ | EP ARSENIC | ☐ | EP LEAD | ☐ |
| CHROMIUM | ☐ | ☐ | MERCURY | ☐ | ☐ | EP CHROMIUM | ☐ | EP MERCURY | ☐ |
| CHROM-HEX | ☐ | ☐ | SELENIUM | ☐ | ☐ | EP CHROM-HEX | ☐ | EP SELENIUM | ☐ |
| ____ | ☐ | ☐ | ____ | ☐ | ☐ | ____ | ☐ | ____ | ☐ |

## SPECIFIC ANALYSES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| pH | ☐ | SULFIDE | ☐ | % SOLIDS | ☐ | ____ | ☐ |
| FLASH PT | ☐ | SP.COND. | ☐ | TOT. PHENOLS | ☐ | ____ | ☐ |
| CYANIDE TOT. | ☐ | TOC | ☐ | CHLORIDE | ☐ | ____ | ☐ |
| CYANIDE AM. | ☐ | TOH | ☐ | FLUORIDE | ☐ | ____ | ☐ |

RECEIVED SEP 19 1984 REMEDIAL ACTIONS UNIT

## ORGANIC ANALYSES

| | | | |
|---|---|---|---|
| PESTICIDE SCREEN (EC) | ☒ | GC-MS ACID EXTRACTABLES | ☐ |
| PCB | ☐ | GC-MS BASE/NEUTRALS | ☐ |
| VOLATILE ORGANICS (VOA) | ☐ | also suspect | |

SPECIFIC ORGANICS: ~~Toxaphene, Chlordane~~, Parathion & DDT

~~(for order of magnitude)~~

APPROVED: SFM 8/10 AUTHORIZED: ____



HW/OCS97F

GEORGIA ENVIRONMENTAL PROTECTION DIVISION

LABORATORY REPORT

SAMPLE DATE: 8AUG84 PROJECT: WOOLFOLK - LENOX W. HSE. COLLECTOR: T. WESTBROOK

| | HW LOG NO. | 924 | 925 | 926 | | |
|---|---|---|---|---|---|---|
| DATE REC'D 8/10/84 | LABEL | WOOLFOLK-LENOX #1 (BACKDOOR) | WOOLFOLK LENOX #2 (Front Door) | WOOLFOLK - LENOX #3 (Under slab) | | |
| TIME REC'D 1508 | | | | | | |
| REC'D BY: D. Reed | | | | | | |
| DEL BY: T. WESTBROOK | | | | | | |
| Harold Lanford LABORATORY MANAGER | | | | | | |
| DATE: | | | | | | |
| PARAMETERS | LAB NO. | | | | | |
| Toxaphene | mg/Kg dry | 984 | 6260 | 3080. | | |
| EP Toxaphene | mg/l | <40 | <40 | <40 | | |

REMARKS:

GEORGIA ENVIRONMENTAL PROTECTION DIVISION
LAND PROTECTION BRANCH

CHAIN OF CUSTODY

FACILITY: WOOLFOLK - LENOX W. HSE.

LOCATION: Lenox, Ga. Rent 2 St.

| SAMPLE # | LOG # | LAB I.D. | DESCRIPTION | COLLECTED BY (Name) | DATE | TIME |
|---|---|---|---|---|---|---|
| #1 | | | WOOLFOLK-LENOX #1 SOILS (BACKDOOR) | T. WESTBROOK | 8AUG84 | 1:30 PM |
| #2 | | | WOOLFOLK-LENOX #2 SOILS (FRONT DOOR) | T. WESTBROOK | 8AUG84 | 1:50 PM |
| #3 | | | WOOLFOLK-LENOX #3 SOILS. (under slab) | T. WESTBROOK | 8AUG84 | 2:00 PM |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

TRANSFER RECORD

| TRANSFERRED BY (Name) | TO (Name) (IF FINAL: Lab Name) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (Name) | DATE |
|---|---|---|---|---|---|---|
| T. Westbrook | FINAL-EPD Lab | 10AUG84 | 1508 | Physical | Danny Reed | 8/10/84 |
| | | | | | | |
| | | | | | | |

ALYSES REQUESTED: Pesticide Scan

25

## APPENDIX C

## REFERENCES


1. Soil Survey of Colquitt and Cook Counties, Georgia: U.S. Department of Agriculture, Soil Conservation Service, 1975.

2. Herrick, Stephen M. 1961, Well Logs of the Coastal Plain of Georgia: Georgia Geologic Survey Bulletin, 70.

3. Wait, Robert L., 1960, Source and Quality of Ground Water in Southwestern Georgia: Georgia Geologic Survey Information Circular 18.

4. Stiles, H.R. and Matthews, S.E., 1983, Groundwater Data for Georgia, 1982: U.S. Geologic Survey Open-File Report 83-678.

5. Odom, Ron R., McCollum, Jerry L., Neville, Mary Anne and Ettman, David R., 1977, Georgia's Protected Wildlife: Georgia Department of Natural Resources.

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7. Sax, N. Irving, 1979, Dangerous Properties of Industrial Materials: Van Nostrand Reinhold Company.

8. Hawley, Gessner G., 1981, The Condensed Chemical Dictionary: Van Nostrand Reinhold Company.

APPENDIX D

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 1 - SITE LOCATION AND INSPECTION INFORMATION**

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. SITE NAME AND LOCATION**

| 01 SITE NAME (Legal, common, or descriptive name of site) | 02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER |
|---|---|
| Woolfolk Chemical - Lenox Warehouse | Rentz Avenue and East Colquitt |

| 03 CITY | 04 STATE | 05 ZIP CODE | 06 COUNTY | 07 COUNTY CODE | 08 CONG DIST |
|---|---|---|---|---|---|
| Lenox | GA | 31637 | Cook | 075 | 2 |

| 09 COORDINATES LATITUDE | LONGITUDE | 10 TYPE OF OWNERSHIP (Check one) |
|---|---|---|
| 31° 16' 17.0" | 083° 27' 45.0" | ☒ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN |

**III. INSPECTION INFORMATION**

| 01 DATE OF INSPECTION (MONTH DAY YEAR) | 02 SITE STATUS | 03 YEARS OF OPERATION (BEGINNING YEAR / ENDING YEAR) |
|---|---|---|
| 8 8 84 | ☐ ACTIVE ☒ INACTIVE | 1976 / 1981 ___ UNKNOWN |

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ___ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ___ (Name of firm)
☒ E. STATE ☐ F. STATE CONTRACTOR GA EPD (Name of firm) ☐ G. OTHER ___ (Specify)

| 05 CHIEF INSPECTOR | 06 TITLE | 07 ORGANIZATION | 08 TELEPHONE NO. |
|---|---|---|---|
| Thomas M. Westbrook | Environmental Specialist | GA EPD | (404) 656-7404 |

| 09 OTHER INSPECTORS | 10 TITLE | 11 ORGANIZATION | 12 TELEPHONE NO. |
|---|---|---|---|
| Jeffrey M. Williams | Environmental Specialist | GA EPD | (404) 656-7404 |
| | | | ( ) |
| | | | ( ) |
| | | | ( ) |
| | | | ( ) |

| 13 SITE REPRESENTATIVES INTERVIEWED | 14 TITLE | 15 ADDRESS | 16 TELEPHONE NO |
|---|---|---|---|
| Bobby Lindsey | Owner | 103 Magnolia Drive | (912) 386-4300 |
| | | P. O. Box 1809 | ( ) |
| | | Tifton, GA 31794 | ( ) |
| | | | ( ) |
| | | | ( ) |
| | | | ( ) |
| | | | |

| 17 ACCESS GAINED BY (Check one) | 18 TIME OF INSPECTION | 19 WEATHER CONDITIONS |
|---|---|---|
| ☒ PERMISSION ☐ WARRANT | 12:00 p.m. | Clear/sunny |

**IV. INFORMATION AVAILABLE FROM**

| 01 CONTACT | 02 OF (Agency/Organization) | 03 TELEPHONE NO. |
|---|---|---|
| Mr. Bobby Lindsey | Owner | (912) 386-4300 |

| 04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM | 05 AGENCY | 06 ORGANIZATION | 07 TELEPHONE NO. | 08 DATE (MONTH DAY YEAR) |
|---|---|---|---|---|
| Jeffrey M. Williams | GA DNR | EPD RAU | 656-7404 | / / |

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
## PART 2 - WASTE INFORMATION

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS**

01 PHYSICAL STATES (Check all that apply)

- [X] A. SOLID
- [X] B. POWDER FINES
- [ ] C. SLUDGE
- [ ] D. OTHER _____ (Specify)
- [ ] E. SLURRY
- [ ] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS Unknown
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [X] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

**III. WASTE TYPE**

| CATEGORY | SUBSTANCE NAME | 01 GROSS AMOUNT | 02 UNIT OF MEASURE | 03 COMMENTS |
|---|---|---|---|---|
| SLU | SLUDGE | | | |
| OLW | OILY WASTE | | | |
| SOL | SOLVENTS | | | |
| PSD | PESTICIDES | Unknown | Unknown | Waste is toxaphene contaminated |
| OCC | OTHER ORGANIC CHEMICALS | | | soil. Amount is unknown because |
| IOC | INORGANIC CHEMICALS | | | extent of contamination is |
| ACD | ACIDS | | | unknown |
| BAS | BASES | | | |
| MES | HEAVY METALS | | | |

**IV. HAZARDOUS SUBSTANCES** (See Appendix for most frequently cited CAS Numbers)

| 01 CATEGORY | 02 SUBSTANCE NAME | 03 CAS NUMBER | 04 STORAGE/DISPOSAL METHOD | 05 CONCENTRATION | 06 MEASURE OF CONCENTRATION |
|---|---|---|---|---|---|
| PSD | Toxaphene | 8001-35-2 | OD (open dump) | 2.88 | ppm (soil) |

**V. FEEDSTOCKS** (See Appendix for CAS Numbers)

| CATEGORY | 01 FEEDSTOCK NAME | 02 CAS NUMBER | CATEGORY | 01 FEEDSTOCK NAME | 02 CAS NUMBER |
|---|---|---|---|---|---|
| FDS | | | FDS | | |
| FDS | | | FDS | | |
| FDS | | | FDS | | |
| FDS | | | FDS | | |

**VI. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

GA EPD Files and Emergency Response Files
Sample analyses from EPD lab and Cooperative Extension Service Lab in Athens, GA
Cleanup information in the State Files from O. H. Materials File.

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. HAZARDOUS CONDITIONS AND INCIDENTS**

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Potential contamination of Brushy Creek surface waters by runoff from two city drainage ditches that are adjacent to the warehouse building.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☒ OBSERVED (DATE: 8/8/84) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: ½ (Acres) 04 NARRATIVE DESCRIPTION

Soils adjaacent to former warehouse and the surrounding lot are known to have received fire fighting waters containing large concentrations of toxaphene. Further sampling needed to define extent of contamination.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☒ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 25 - 50 04 NARRATIVE DESCRIPTION

Warehouse lot is open and is in a residential/urban setting, pedestrain traffic is not controlled. Residences are present on 3 adjacent sides of the warehouse lot.

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. HAZARDOUS CONDITIONS AND INCIDENTS** *(Continued)*

01 [X] J. DAMAGE TO FLORA — 02 [X] OBSERVED (DATE: 8/8/84) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

Several areas that apparently received water runoff from the fire in 1981 did not appear to be able to support plant growth in 1984. (Trip Report - T. Westbrook 8/8/84)

01 [ ] K. DAMAGE TO FAUNA — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION *(Include name(s) of species)*

01 [ ] L. CONTAMINATION OF FOOD CHAIN — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] M. UNSTABLE CONTAINMENT OF WASTES *(Spills, Runoff, Standing liquids, Leaking drums)* — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 [X] N. DAMAGE TO OFFSITE PROPERTY — 02 [X] OBSERVED (DATE: 7/1/81) — [X] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

Samples of waters in ditches adjacent to site as a result of fire fighting activities were observed to contain from 10 to 263 ppm (mg/L) of toxaphene. Length of ditch is approximately 0.3 miles.

01 [ ] O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] P. ILLEGAL/UNAUTHORIZED DUMPING — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

Inside the warehouse, plywood and various wood beams remain and appear to have residual contamination. Remnant insulation on ceilings and walls was observed and may contain contaminants.

**III. TOTAL POPULATION POTENTIALLY AFFECTED:** 25-50

**IV. COMMENTS**

As a result of a complaint from the warehouse owner in June 1984, this site has been discovered to ERRIS. Efforts are under way to effect an assessment and remedial action plan.

**V. SOURCES OF INFORMATION** *(Cite specific references, e.g., state files, sample analysis, reports)*

GA State File information
GA EPD Lab analyses of ditch water samples.
Independent lab work on samples taken during cleanup conducted by O.H. Materials.
GA EPD lab analyses of 8/8/84 soil samples.

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION
### PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. PERMIT INFORMATION**

| 01 TYPE OF PERMIT ISSUED (Check all that apply) | 02 PERMIT NUMBER | 03 DATE ISSUED | 04 EXPIRATION DATE | 05 COMMENTS |
|---|---|---|---|---|
| ☐ A. NPDES | | | | |
| ☐ B. UIC | | | | |
| ☐ C. AIR | | | | |
| ☐ D. RCRA | | | | |
| ☐ E. RCRA INTERIM STATUS | | | | |
| ☐ F. SPCC PLAN | | | | |
| ☐ G. STATE (Specify) | | | | |
| ☐ H. LOCAL (Specify) | | | | |
| ☐ I. OTHER (Specify) | | | | |
| X J. NONE | | | | Permit not required |

**III. SITE DESCRIPTION**

| 01 STORAGE/DISPOSAL (Check all that apply) | 02 AMOUNT | 03 UNIT OF MEASURE |
|---|---|---|
| ☐ A. SURFACE IMPOUNDMENT | | |
| ☐ B. PILES | | |
| ☐ C. DRUMS, ABOVE GROUND | | |
| ☐ D. TANK, ABOVE GROUND | | |
| ☐ E. TANK, BELOW GROUND | | |
| ☐ F. LANDFILL | | |
| ☐ G. LANDFARM | | |
| X H. OPEN DUMP | Unknown | |
| ☐ I. OTHER (Specify) | | |

04 TREATMENT (Check all that apply)
- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER
- X A. BUILDINGS ON SITE

100' x 60'

06 AREA OF SITE

1½ (Acres)

07 COMMENTS

Site is located in a poorly drained area that is located within a residential urban setting. Soils at the site are known to contain unknown quantities of toxaphene. Fire fighting waters were treated as a result of a 1981 fire, but soils were not treated.

**IV. CONTAINMENT**

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☒ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Contamination of soils appear to be contained to the site boundaries. EP toxicity tests show no potential for the contaminant, toxaphene to leach into the soils. Site is bordered by two drainage ditches that may contain contaminated soils.

**V. ACCESSIBILITY**

01 WASTE EASILY ACCESSIBLE X YES ☐ NO

02 COMMENTS

Warehouse lot is open in a residential setting. Residences are present on 3 adjacent sides of the warehouse lot.

**VI. SOURCES OF INFORMATION** (Cite specific references, e.g. state files, sample analysis, reports)

GA EPD State Files
EPD Site Inspection 8/8/84 - Thomas M. Westbrook

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

## II. DRINKING WATER SUPPLY

| 01 TYPE OF DRINKING SUPPLY (Check as applicable) | SURFACE | WELL | 02 STATUS: ENDANGERED | AFFECTED | MONITORED | 03 DISTANCE TO SITE |
|---|---|---|---|---|---|---|
| COMMUNITY | A. ☐ | B. ☒ | A. ☐ | B. ☐ | C. ☐ | A. ¼ (mi) |
| NON-COMMUNITY | C. ☐ | D. ☐ | D. ☐ | E. ☐ | F. ☐ | B. ¼ (mi) |

## III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☒ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 960

03 DISTANCE TO NEAREST DRINKING WATER WELL ¼ (mi)

| 04 DEPTH TO GROUNDWATER | 05 DIRECTION OF GROUNDWATER FLOW | 06 DEPTH TO AQUIFER OF CONCERN | 07 POTENTIAL YIELD OF AQUIFER | 08 SOLE SOURCE AQUIFER |
|---|---|---|---|---|
| Unknown (ft) | SSE | 300-400 (ft) | 360,000 (gpd) | ☒ YES ☐ NO |

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

There are two municipal wells located within the city of Lenox, GA. Both wells are 8 inch wells that are approximately 350 feet deep. Well #1 is located at the corner of Gray St. and Haze Rd. Well #2 is located on Broad Street at the water storage tank.

| 10 RECHARGE AREA | | 11 DISCHARGE AREA | |
|---|---|---|---|
| ☒ YES ☐ NO | COMMENTS Recharge area for shallow aquifer and to a lesser extent for the Principal Artesian Aquifer. | ☒ YES ☐ NO | COMMENTS Shallow aquifer discharges into the New River. |

## IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☐ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

| NAME: | AFFECTED | DISTANCE TO SITE |
|---|---|---|
| Brushy Creek | ☐ | ½ (mi) |
| | ☐ | (mi) |
| | ☐ | (mi) |

## V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

| ONE (1) MILE OF SITE | TWO (2) MILES OF SITE | THREE (3) MILES OF SITE |
|---|---|---|
| A. 966 NO. OF PERSONS | B. NO. OF PERSONS | C. NO. OF PERSONS |

02 DISTANCE TO NEAREST POPULATION: 0.1 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE: 330

04 DISTANCE TO NEAREST OFF-SITE BUILDING: 0.1 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

Site is located in a residential urban setting with 3 residences located on 3 adjacent sides of the warehouse lot. Site is located in downtown area of city of Lenox within a densely populated area.

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

## VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN $10^{-3}$ cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than $10^{-6}$ cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☒ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than $10^{-2}$ cm/sec)

| 03 DEPTH TO BEDROCK | 04 DEPTH OF CONTAMINATED SOIL ZONE | 05 SOIL pH |
|---|---|---|
| 200 (ft) | 1-2 (ft) | 4.5-5.5 |

| 06 NET PRECIPITATION | 07 ONE YEAR 24 HOUR RAINFALL | 08 SLOPE: SITE SLOPE | DIRECTION OF SITE SLOPE | TERRAIN AVERAGE SLOPE |
|---|---|---|---|---|
| (in) | (in) | 0-3 % | SSW | 0-3 % |

09 FLOOD POTENTIAL

SITE IS IN _____ YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

_____ (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

| COMMERCIAL/INDUSTRIAL | RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES | AGRICULTURAL LANDS: PRIME AG LAND | AGRICULTURAL LANDS: AG LAND |
|---|---|---|---|
| A. 0.2 (mi) | B. 0.1 (mi) | C. 1-2 (mi) | D. 0.4 (mi) |

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site is on relatively flat land (300' elevation) approximately ½ to 1 mile from the surface waters of Brushy Creek. Elevations of 240 feet are found about 4 miles east of the site along the New River. Land south of the site is typically laden with ponds and large depressions. Site is located on a topographic high with respect to the immediate and surrounding topography.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Lenox, Georgia 7.5 Minute Topographic map,
USDA-USFS Soil Survey Map of Cook County
Department of Commerce and Flood Insurance Map for Cook County compiled by US Department of Housing and Urban Development.

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 6 - SAMPLE AND FIELD INFORMATION

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. SAMPLES TAKEN**

| SAMPLE TYPE | 01 NUMBER OF SAMPLES TAKEN | 02 SAMPLES SENT TO | 03 ESTIMATED DATE RESULTS AVAILABLE |
|---|---|---|---|
| GROUNDWATER | | | |
| SURFACE WATER | | | |
| WASTE | | | |
| AIR | | | |
| RUNOFF | | | |
| SPILL | | | |
| SOIL | Three | GA EPD lab | attached |
| VEGETATION | | | |
| OTHER | | | |

**III. FIELD MEASUREMENTS TAKEN**

| 01 TYPE | 02 COMMENTS |
|---|---|
| | |
| | |
| | |
| | |
| | |

**IV. PHOTOGRAPHS AND MAPS**

01 TYPE ☐ GROUND ☐ AERIAL

02 IN CUSTODY OF _____ (Name of organization or individual)

03 MAPS X YES ☐ NO

04 LOCATION OF MAPS Sketch map in report (Figure 2)

**V. OTHER FIELD DATA COLLECTED** (Provide narrative description)

**VI. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

Trip Report - 8/8/84 - Thomas M. Westbrook - GA EPD

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 7 - OWNER INFORMATION

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

| II. CURRENT OWNER(S) | | | PARENT COMPANY (If applicable) | | |
|---|---|---|---|---|---|
| 01 NAME<br>Mr. Bobby Lindsey | | 02 D+B NUMBER | 08 NAME | | 09 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.)<br>103 Magnolia Drive,PO Box 1809 | | 04 SIC CODE | 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 11 SIC CODE |
| 05 CITY<br>Tifton | 06 STATE<br>GA | 07 ZIP CODE<br>31794 | 12 CITY | 13 STATE | 14 ZIP CODE |
| 01 NAME | | 02 D+B NUMBER | 08 NAME | | 09 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 11 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 12 CITY | 13 STATE | 14 ZIP CODE |
| 01 NAME | | 02 D+B NUMBER | 08 NAME | | 09 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 11 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 12 CITY | 13 STATE | 14 ZIP CODE |
| 01 NAME | | 02 D+B NUMBER | 08 NAME | | 09 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 11 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 12 CITY | 13 STATE | 14 ZIP CODE |

| III. PREVIOUS OWNER(S) (List most recent first) | | | IV. REALTY OWNER(S) (If applicable; list most recent first) | | |
|---|---|---|---|---|---|
| 01 NAME | | 02 D+B NUMBER | 01 NAME | | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 05 CITY | 06 STATE | 07 ZIP CODE |
| 01 NAME | | 02 D+B NUMBER | 01 NAME | | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 05 CITY | 06 STATE | 07 ZIP CODE |
| 01 NAME | | 02 D+B NUMBER | 01 NAME | | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 05 CITY | 06 STATE | 07 ZIP CODE |

**V. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

Telephone memo - to Mr. Bobby Lindsey
EPA Form 2070-12 Preliminary Assessment

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 8 - OPERATOR INFORMATION

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. CURRENT OPERATOR** *(Provide if different from owner)*

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS *(P.O. Box, RFD #, etc.)* | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

| 08 YEARS OF OPERATION | 09 NAME OF OWNER |
|---|---|
| | |

**OPERATOR'S PARENT COMPANY** *(If applicable)*

| 10 NAME | 11 D+B NUMBER |
|---|---|
| | |

| 12 STREET ADDRESS *(P.O. Box, RFD #, etc.)* | 13 SIC CODE |
|---|---|
| | |

| 14 CITY | 15 STATE | 16 ZIP CODE |
|---|---|---|
| | | |

**III. PREVIOUS OPERATOR(S)** *(List most recent first; provide only if different from owner)*

| 01 NAME | 02 D+B NUMBER |
|---|---|
| Woolfolk Chemical Works | |

| 03 STREET ADDRESS *(P.O. Box, RFD #, etc.)* | 04 SIC CODE |
|---|---|
| P. O. Box 938 | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| Fort Valley | GA | 31031 |

| 08 YEARS OF OPERATION | 09 NAME OF OWNER DURING THIS PERIOD |
|---|---|
| 1976-1981 | Mr. Bobby Lindsey |

**PREVIOUS OPERATORS' PARENT COMPANIES** *(If applicable)*

| 10 NAME | 11 D+B NUMBER |
|---|---|
| | |

| 12 STREET ADDRESS *(P.O. Box, RFD #, etc.)* | 13 SIC CODE |
|---|---|
| | |

| 14 CITY | 15 STATE | 16 ZIP CODE |
|---|---|---|
| | | |

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS *(P.O. Box, RFD #, etc.)* | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

| 08 YEARS OF OPERATION | 09 NAME OF OWNER DURING THIS PERIOD |
|---|---|
| | |

| 10 NAME | 11 D+B NUMBER |
|---|---|
| | |

| 12 STREET ADDRESS *(P.O. Box, RFD #, etc.)* | 13 SIC CODE |
|---|---|
| | |

| 14 CITY | 15 STATE | 16 ZIP CODE |
|---|---|---|
| | | |

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS *(P.O. Box, RFD #, etc.)* | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

| 08 YEARS OF OPERATION | 09 NAME OF OWNER DURING THIS PERIOD |
|---|---|
| | |

| 10 NAME | 11 D+B NUMBER |
|---|---|
| | |

| 12 STREET ADDRESS *(P.O. Box, RFD #, etc.)* | 13 SIC CODE |
|---|---|
| | |

| 14 CITY | 15 STATE | 16 ZIP CODE |
|---|---|---|
| | | |

**IV. SOURCES OF INFORMATION** *(Cite specific references, e.g., state files, sample analysis, reports)*

State Files - GA EPD - Woolfolk Chemical Lenox Warehouse
Mr. Bobby Lindsey

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 9 - GENERATOR/TRANSPORTER INFORMATION

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

## II. ON-SITE GENERATOR

| 01 NAME | 02 D+B NUMBER | |
|---|---|---|
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | |
| 05 CITY / 06 STATE | 07 ZIP CODE | |

## III. OFF-SITE GENERATOR(S)

| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
|---|---|---|---|
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY / 06 STATE | 07 ZIP CODE | 05 CITY / 06 STATE | 07 ZIP CODE |
| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY / 06 STATE | 07 ZIP CODE | 05 CITY / 06 STATE | 07 ZIP CODE |

## IV. TRANSPORTER(S)

| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
|---|---|---|---|
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY / 06 STATE | 07 ZIP CODE | 05 CITY / 06 STATE | 07 ZIP CODE |
| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY / 06 STATE | 07 ZIP CODE | 05 CITY / 06 STATE | 07 ZIP CODE |

## V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 10 - PAST RESPONSE ACTIVITIES**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. PAST RESPONSE ACTIVITIES**

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ D. SPILLED MATERIAL REMOVED — 02 DATE 7/11/81 — 03 AGENCY O. H. Materials Co.
04 DESCRIPTION
Approximately 200 $yd^3$ material shipped to Emelle, Alabama as a result of the 7/81 warehouse fire.

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE 7/1/81 — 03 AGENCY City of Lenox
04 DESCRIPTION Construction of earth dams was undertaken to stop the pesticide contaminated waters from draining off-site.

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 10 - PAST RESPONSE ACTIVITIES**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832814 |

**II PAST RESPONSE ACTIVITIES** *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ X. FIRE CONTROL — 02 DATE 7/1/81 — 03 AGENCY City of Lenox
04 DESCRIPTION A chemical fire on 7/1/81 at the Lenox Warehouse in which several gallons of fire fighting waters carried chemicals into a nearby drainage ditch.

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

**III. SOURCES OF INFORMATION** *(Cite specific references, e.g., state files, sample analysis, reports)*

GA EPD State Files

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 11 - ENFORCEMENT INFORMATION**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. ENFORCEMENT INFORMATION**

01 PAST REGULATORY/ENFORCEMENT ACTION [ ] YES [X] NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

No Regulatory Enforcement Action has taken place to date. GA EPD Emergency Response Team Member Edward Cook responded to a 7/1/81 chemical fire at the subject site and supervised the warehouse clean-up.

**III. SOURCES OF INFORMATION** *(Cite specific references, e.g., state files, sample analysis, reports)*

GA EPD State Files - Emergency Response Team Files

EPA FORM 2070-13 (7-81)

Received 9/19/84
entered in ERCIS 9/19/84
CBW

needs S.I.
surface soils
should be
ranked

ARDOUS WASTE SITE
RY ASSESSMENT
MATION AND ASSESSMENT

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. SITE**

01 SITE N

03 CITY

09 COORD

10 DIRECT

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: Rentz Ave. and East Colquitt

| 04 STATE | 05 ZIP CODE | 06 COUNTY | 07 COUNTY CODE | 08 CONG DIST |
|---|---|---|---|---|
| GA | 31637 | Cook | 075 | 2 |

ection of I-75 and Central Ave. (Lenox exit
lroad tracks (Southern & Fla.) to intersection
with Rentz. Turn right (south) onto Rentz and proceed one block to warehouse(onleft).

**III. RESPONSIBLE PARTIES**

| 01 OWNER (If known) | 02 STREET (Business, mailing, residential) |
|---|---|
| Mr. Bobby Lindsey | 103 Magnolia Drive P.O. Box 1809 |

| 03 CITY | 04 STATE | 05 ZIP CODE | 06 TELEPHONE NUMBER |
|---|---|---|---|
| Tifton | GA | 31794 | (912) 386-4300 |

| 07 OPERATOR (If known and different from owner) | 08 STREET (Business, mailing, residential) |
|---|---|
| (Former) Woolfolk Chemical Works | P.O. Box 938 |

| 09 CITY | 10 STATE | 11 ZIP CODE | 12 TELEPHONE NUMBER |
|---|---|---|---|
| Fort Valley | GA | 31030 | ( ) |

13 TYPE OF OWNERSHIP (Check one)

☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: / / (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR) ☒ C. NONE

**IV. CHARACTERIZATION OF POTENTIAL HAZARD**

01 ON SITE INSPECTION

☒ YES DATE 8/8/84 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)

☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION

Late 1970's 1981 (BEGINNING YEAR ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED Warehouse for extensive herbicide and pesticide (agricultural) product lines. Suspected compounds of regulatory importance Toxaphene. Parathion. Chlordane and DDE.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION Soils adjacent to warehouse and two ditches received large quantities of fire-fighting waters. These waters were tested and contained excessive amounts of Toxaphene. The waters were treated, however, ditch soils and soils around building remain.

**V. PRIORITY ASSESSMENT**

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

**VI. INFORMATION AVAILABLE FROM**

| 01 CONTACT | 02 OF (Agency/Organization) | 03 TELEPHONE NUMBER |
|---|---|---|
| Mr. Bobby Lindsey | Owner | (912) 386-4300 |

| 04 PERSON RESPONSIBLE FOR ASSESSMENT | 05 AGENCY | 06 ORGANIZATION | 07 TELEPHONE NUMBER | 08 DATE |
|---|---|---|---|---|
| Thomas Westbrook TMW | GA DNR | R.A.U. | (404) 656-7404 | 8 28 84 (MONTH DAY YEAR) |

EPA FORM 2070-12 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## PRELIMINARY ASSESSMENT
### PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. HAZARDOUS CONDITIONS AND INCIDENTS**

01 ☐ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: ½ (Acres)
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Soils adjacent to former warehouse and the surrounding lot are known to have received fire fighting waters containing large concentrations of Toxaphene.

01 ☐ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: 25-50
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Warehouse lot is open and in a residential/urban setting. Pedestrian traffic is not controlled. Residences were observed on 3 adjacent sides of the warehouse lot.

BLACK & VEATCH Waste Science, Inc.

TELEPHONE MEMORANDUM

ARCS IV
Lennox Warehouse - Wollfolk Chemicals
City of Adel Water Supply

BVWS Project 52012.429
BVWS File D.2
May 5, 1994
1:30 p.m.

From: Buddy Guy
Company: City of Adel, Water and Sewer Department
Phone No.: (912) 896-4707

Recorded by: Jon Erskine

Mr. Guy said that the City of Adel receives its water from five deep wells. No surface water is used.

Georgia Department of Natural Resources
Wildlife Resources Division

JOE D. TANNER, COMMISSIONER
DAVID WALLER, DIVISION DIRECTOR

Georgia Natural Heritage Program
2117 U.S. Hwy 278, SE, Social Circle, Georgia 30279
(404) 918-6411 & (706) 557-3032

Reference 7

Dear Database User:

Please keep in mind the limitations of our database. The site in question may contain rare species or important natural areas of which we are unaware.

The data collected by the Georgia Natural Heritage Program comes from a variety of sources, including museum and herbarium records, literature, and reports from individuals and organizations, as well as field surveys by our staff biologists. In most cases the information is not the result of an on-site survey by our staff. Many areas in Georgia have never been surveyed thoroughly. Therefore, the Georgia Natural Heritage Program can only occasionally provide definitive information on the presence or absence of rare species on a given site.

Our files are updated constantly as new information is received. Thus, information provided by our program represents the existing data in our files at the time of the request and should not be considered a final statement on the species or area under consideration.

Sincerely,

Georgia Natural Heritage Program

# SPECIAL ANIMALS OF GEORGIA

## GEORGIA DEPARTMENT OF NATURAL RESOURCES, WILDLIFE RESOURCES DIVISION, GEORGIA NATURAL HERITAGE PROGRAM

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | STATE RANK | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|---|---|
| ACANTHARCHUS POMOTIS | MUD SUNFISH | G5 | S3 | | |
| ACIPENSER BREVIROSTRUM | SHORTNOSE STURGEON | G3 | S2 | LE | E |
| ACIPENSER FULVESCENS | LAKE STURGEON | G3 | SH | C2 | |
| AIMOPHILA AESTIVALIS | BACHMAN'S SPARROW | G3 | S3 | C2 | R |
| ALASMIDONTA ARCULA | ALTAMAHA ARC MUSSEL | G2 | S1S3 | C2 | |
| ALASMIDONTA MACCORDI | COOSA ELKTOE | GX | SH | 3A | |
| ALOSA ALABAMAE | ALABAMA SHAD | G4 | S1 | | U |
| ALOSA CHRYSOCHLORIS | SKIPJACK HERRING | G5 | S2? | | |
| AMBYSTOMA CINGULATUM | FLATWOODS SALAMANDER | G4 | S3 | C2 | R |
| AMEIURUS SERRACANTHUS | SPOTTED BULLHEAD | G3 | S2 | | R |
| AMMODRAMUS HENSLOWII | HENSLOW'S SPARROW | G4 | S3 | | |
| AMMODRAMUS MARITIMUS | SEASIDE SPARROW | G4 | S4 | | |
| AMPHIUMA PHOLETER | ONE-TOED AMPHIUMA | G3 | S1 | | R |
| ANEIDES AENEUS | GREEN SALAMANDER | G3G4 | S2 | C2 | R |
| AQUILA CHRYSAETOS | GOLDEN EAGLE | G4 | S1 | | |
| ARAMUS GUARAUNA | LIMPKIN | G5 | S1S2 | | |
| BALAENOPTERA BOREALIS | SEI WHALE | G2 | S? | LE | |
| BALAENOPTERA PHYSALUS | FIN WHALE | G2 | S? | LE | |
| BELONEURIA GEORGIANA | GEORGIA BELONEURIAN STONEFLY | G1G3 | S1S3 | 3C | |
| BOTAURUS LENTIGINOSUS | AMERICAN BITTERN | G4 | S3? | | |
| CAMBARUS EXTRANEUS | CHICKAMAUGA CRAYFISH | G3 | S? | C2 | |
| CAMPEPHILUS PRINCIPALIS | IVORY-BILLED WOODPECKER | G1 | SX | LE | E |
| CARETTA CARETTA | LOGGERHEAD SEA TURTLE | G3 | S3 | LT | T |
| CARUNCULINA PULLA | SAVANNAH SHORE MUSSEL | G3 | S1S3 | C2 | |
| CATHARUS FUSCESCENS | VEERY | G5 | S4 | | |
| CHARADRIUS MELODUS | PIPING PLOVER | G3 | S1S2 | LELT | T |
| CHARADRIUS WILSONIA | WILSON'S PLOVER | G5 | S2S3 | | R |
| CHELONIA MYDAS | GREEN SEA TURTLE | G3 | S1 | LELT | T |
| CLEMMYS GUTTATA | SPOTTED TURTLE | G5 | S3S4 | | U |
| CLEMMYS MUHLENBERGII | BOG TURTLE | G4 | S1 | C2 | T |
| CLETHRIONOMYS GAPPERI | SOUTHERN RED-BACKED VOLE | G5 | S3S4 | | |
| COCCYZUS ERYTHROPTHALMUS | BLACK-BILLED CUCKOO | G5 | S3? | | |
| CONDYLURA CRISTATA | STAR-NOSED MOLE | G5 | S2? | | |
| CORDULEGASTER SAYI | SAY'S SPIKETAIL DRAGONFLY | G1G2 | S? | C2 | |
| CORVUS CORAX | COMMON RAVEN | G5 | SU | | R |
| CRYPTOBRANCHUS ALLEGANIENSIS | HELLBENDER | G4 | S3 | C2 | R |
| CYCLEPTUS ELONGATUS | BLUE SUCKER | G4 | SX | C2 | |
| CYPRINELLA CAERULEA | BLUE SHINER | G2 | S1S2 | C2 | E |
| CYPRINELLA CALLISEMA | OCMULGEE SHINER | G3 | S3 | | |
| CYPRINELLA CALLITAENIA | BLUESTRIPE SHINER | G2 | S1 | C2 | T |
| CYPRINELLA GALACTURA | WHITETAIL SHINER | G5 | S3 | | |
| CYPRINELLA GIBBSI | TALLAPOOSA SHINER | G4 | S3 | | R |
| CYPRINELLA LEEDSI | BANNERFIN SHINER | G3 | S3S4 | | |
| CYPRINELLA MONACHA | SPOTFIN CHUB | G2 | SH | LT | |
| CYPRINELLA NIVEA | WHITEFIN SHINER | G4 | S3 | | |
| CYPRINELLA SPILOPTERA | SPOTFIN SHINER | G5 | S2 | | |
| CYPRINELLA XAENURA | ALTAMAHA SHINER | G3? | S3 | C2 | E |
| DENDROICA CERULEA | CERULEAN WARBLER | G5 | S3? | | |

# SPECIAL ANIMALS OF GEORGIA

## GEORGIA DEPARTMENT OF NATURAL RESOURCES, WILDLIFE RESOURCES DIVISION, GEORGIA NATURAL HERITAGE PROGRAM

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | STATE RANK | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|---|---|
| DENDROICA KIRTLANDII | KIRTLAND'S WARBLER | G1 | SN | LE | E |
| DERMOCHELYS CORIACEA | LEATHERBACK SEA TURTLE | G3 | S1 | LE | E |
| DESMOGNATHUS AENEUS | SEEPAGE SALAMANDER | G4 | S3 | | |
| DOLANIA AMERICANA | AMERICAN SAND-BURROWING MAYFLY | G? | S? | C2 | |
| DORMITATOR MACULATUS | FAT SLEEPER | G5 | S3 | | |
| DRYMARCHON CORAIS COUPERI | EASTERN INDIGO SNAKE | G4T3 | S3 | LT | T |
| EGRETTA RUFESCENS | REDDISH EGRET | G4 | S2S3 | C2 | |
| ELANOIDES FORFICATUS | AMERICAN SWALLOW-TAILED KITE | G5 | S2 | | R |
| ELEOTRIS PISONIS | SPINYCHEEK SLEEPER | G5 | S3 | | |
| ELLIPTIO NIGELLA | RECOVERY PEARLY MUSSEL | GH | SH | C2 | |
| ELLIPTIO SPINOSA | GEORGIA SPINEY MUSSEL | G1 | S1S3 | C2 | |
| EMPIDONAX MINIMUS | LEAST FLYCATCHER | G5 | S3 | | |
| EMPIDONAX TRAILLII | WILLOW FLYCATCHER | G5 | S3 | | |
| ENNEACANTHUS CHAETODON | BLACKBANDED SUNFISH | G5 | S1S2 | | R |
| EPIOBLASMA METASTRIATA | UPLAND COMBSHELL | G1Q | S? | C2 | E |
| EPIOBLASMA OTHCALOOGENSIS | SOUTHERN ACORNSHELL | G1Q | S? | C2 | E |
| ERETMOCHELYS IMBRICATA | HAWKSBILL SEA TURTLE | G3 | SN | LE | E |
| ERIMYSTAX INSIGNIS | BLOTCHED CHUB | G4? | S2 | | T |
| ETHEOSTOMA BREVIROSTRUM | HOLIDAY DARTER | G? | S? | | T |
| ETHEOSTOMA CAERULEUM | RAINBOW DARTER | G5 | S1 | | |
| ETHEOSTOMA CAMURUM | BLUEBREAST DARTER | G3 | S1? | | |
| ETHEOSTOMA CHLOROBRANCHIUM | GREENFIN DARTER | G3 | S1 | | T |
| ETHEOSTOMA CINEREUM | ASHY DARTER | G2 | S1 | | |
| ETHEOSTOMA COOSAE | COOSA DARTER | G4 | S3 | | |
| ETHEOSTOMA DITREMA | COLDWATER DARTER | G2 | S1 | C2 | T |
| ETHEOSTOMA DURYI | BLACK DARTER | G4 | S1 | | R |
| ETHEOSTOMA EDWINI | BROWN DARTER | G5 | S3 | | |
| ETHEOSTOMA FRICKSIUM | SAVANNAH DARTER | G3 | S2 | | |
| ETHEOSTOMA JESSIAE | BLUESIDE DARTER | G4Q | S2 | | |
| ETHEOSTOMA JORDANI | GREENBREAST DARTER | G4 | S2S3 | | |
| ETHEOSTOMA KENNICOTTI | STRIPETAIL DARTER | G5 | S1 | | |
| ETHEOSTOMA MACULATUM | SPOTTED DARTER | G2 | S1 | | |
| ETHEOSTOMA PARVIPINNE | GOLDSTRIPE DARTER | G4 | S2 | | R |
| ETHEOSTOMA RUFILINEATUM | REDLINE DARTER | G5 | S2 | | |
| ETHEOSTOMA RUPESTRE | ROCK DARTER | G4 | S2S3 | | |
| ETHEOSTOMA SERRIFERUM | SAWCHEEK DARTER | G5 | S3 | | |
| ETHEOSTOMA SIMOTERUM | TENNESSEE SNUBNOSE DARTER | G5 | S1 | | |
| ETHEOSTOMA SP. CF COOSAE | CHEROKEE DARTER | G? | S? | | T |
| ETHEOSTOMA SP. CF JORDANI | ETOWAH DARTER | G? | S? | | T |
| ETHEOSTOMA SP. CF JORDANI | LIPSTICK DARTER | G? | S? | | E |
| ETHEOSTOMA SWAINI | GULF DARTER | G5 | S3 | | |
| ETHEOSTOMA TALLAPOOSAE | TALLAPOOSA DARTER | G? | S? | | R |
| ETHEOSTOMA TRISELLA | TRISPOT DARTER | G2 | S1 | C2 | T |
| ETHEOSTOMA VULNERATUM | WOUNDED DARTER | G? | S? | | E |
| ETHEOSTOMA ZONALE | BANDED DARTER | G5 | S1S2 | | |
| EUBALAENA GLACIALIS | NORTHERN RIGHT WHALE | G2 | S1 | LE | E |
| EUMECES ANTHRACINUS | COAL SKINK | G5 | S1 | | |
| EUMECES EGREGIUS | MOLE SKINK | G5 | S3 | | |

# SPECIAL ANIMALS OF GEORGIA

## GEORGIA DEPARTMENT OF NATURAL RESOURCES, WILDLIFE RESOURCES DIVISION, GEORGIA NATURAL HERITAGE PROGRAM

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | STATE RANK | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|---|---|
| EURYCEA LONGICAUDA | LONGTAIL SALAMANDER | G5 | S2 | | |
| EURYCEA LUCIFUGA | CAVE SALAMANDER | G5 | S3 | | |
| EURYCEA WILDERAE | BLUE RIDGE TWO-LINED SALAMANDER | G5Q | S2? | | |
| EXTRARIUS AESTIVALIS | SPECKLED CHUB | G5 | S1S2 | | |
| FALCO PEREGRINUS | PEREGRINE FALCON | G3 | S1 | E/SA | E |
| FARANCIA ERYTROGRAMMA | RAINBOW SNAKE | G5 | S3 | | |
| FELIS CONCOLOR CORYI | FLORIDA PANTHER | G4T1 | SH | LE | E |
| FELIS CONCOLOR COUGUAR | EASTERN COUGAR | G4TH | SR | LE | E |
| FUNDULUS AUROGUTTATUS | BANDED TOPMINNOW | G5? | S3 | | R |
| FUNDULUS BIFAX | STIPPLED STUDFISH | G? | S? | | E |
| FUNDULUS CATENATUS | NORTHERN STUDFISH | G5 | S1 | | T |
| FUNDULUS CHRYSOTUS | GOLDEN TOPMINNOW | G5 | S3 | | |
| FUNDULUS ESCAMBIAE | EASTERN STARHEAD TOPMINNOW | G? | S3 | | |
| FUNDULUS LUCIAE | SPOTFIN KILLIFISH | G4? | S3 | | |
| FUSCONAIA MASONI | ATLANTIC PIGTOE MUSSEL | G3 | S? | | E |
| GEOMYS PINETIS FONTANELUS | SHERMAN'S POCKET GOPHER | G5TH | S4 | 3A | |
| GOPHERUS POLYPHEMUS | GOPHER TORTOISE | G2 | S3 | LTC2 | T |
| GRAPTEMYS BARBOURI | BARBOUR'S MAP TURTLE | G2 | S2 | C2 | T |
| GRAPTEMYS GEOGRAPHICA | MAP TURTLE | G5 | S1 | | R |
| GRAPTEMYS PULCHRA | ALABAMA MAP TURTLE | G4 | S1 | | R |
| GRUS CANADENSIS PRATENSIS | FLORIDA SANDHILL CRANE | G5T2T3 | S1 | | |
| GRUS CANADENSIS TABIDA | GREATER SANDHILL CRANE | G5TU | S2 | | |
| HAEMATOPUS PALLIATUS | AMERICAN OYSTERCATCHER | G5 | S2S3 | | R |
| HAIDEOTRITON WALLACEI | GEORGIA BLIND SALAMANDER | G2 | S1 | C2 | T |
| HALIAEETUS LEUCOCEPHALUS LEUCOCEPHALUS | SOUTHERN BALD EAGLE | G3TU | S2 | | E |
| HEMIDACTYLIUM SCUTATUM | FOUR-TOED SALAMANDER | G5 | S2 | | |
| HEMITREMIA FLAMMEA | FLAME CHUB | G4 | S1 | | E |
| HETEROCLEON BERNERI | BERNER'S TWO-WINGED MAYFLY | G1G3 | S1S3 | C2 | |
| HETERODON SIMUS | SOUTHERN HOGNOSE SNAKE | G4G5 | S3 | | |
| HIMANTOPUS MEXICANUS | BLACK-NECKED STILT | G5 | S1S2 | | |
| HIODON TERGISUS | MOONEYE | G5 | S1 | | |
| HOMOEONEURIA DOLANI | BLACKWATER SAND-FILTERING MAYFLY | G? | S? | C2 | |
| HYBOGNATHUS REGIUS | EASTERN SILVERY MINNOW | G5 | S2? | | |
| HYBOPSIS AMBLOPS | BIGEYE CHUB | G4? | S1S2 | | R |
| HYBOPSIS LINEAPUNCTATA | LINED CHUB | G3 | S3 | | |
| ICHTHYOMYZON BDELLIUM | OHIO LAMPREY | G3 | S3? | | R |
| ICHTHYOMYZON CASTANEUS | CHESTNUT LAMPREY | G5 | S3 | | |
| ICHTHYOMYZON GAGEI | SOUTHERN BROOK LAMPREY | G5 | S3 | | |
| ICHTHYOMYZON GREELEYI | ALLEGANY BROOK LAMPREY | G3 | S3 | | |
| KINOSTERNON BAURII | STRIPED MUD TURTLE | G5 | S3 | | |
| LAMPETRA AEPYPTERA | LEAST BROOK LAMPREY | G5 | S3 | | |
| LAMPROPELTIS TRIANGULUM | MILK SNAKE | G5 | S2 | | |
| LAMPSILIS ALTILIS | FINE-LINED POCKETBOOK | G? | S? | C2 | T |
| LANIUS LUDOVICIANUS MIGRANS | MIGRANT LOGGERHEAD SHRIKE | G4T2 | S? | C2 | |
| LASIURUS INTERMEDIUS | NORTHERN YELLOW BAT | G4G5 | S2S3 | | |
| LATERALLUS JAMAICENSIS | BLACK RAIL | G4? | S2? | | |
| LEPIDOCHELYS KEMPII | KEMP'S RIDLEY SEA TURTLE | G1 | SN | LE | E |
| LEPISOSTEUS OCULATUS | SPOTTED GAR | G5 | S1 | | |

# SPECIAL ANIMALS OF GEORGIA

## GEORGIA DEPARTMENT OF NATURAL RESOURCES, WILDLIFE RESOURCES DIVISION, GEORGIA NATURAL HERITAGE PROGRAM

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | STATE RANK | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|---|---|
| LEUROGNATHUS MARMORATUS | SHOVELNOSE SALAMANDER | G4 | S3 | | |
| LORDITHON NIGER | BLACK LORDITHON ROVE BEETLE | G? | S? | C2 | |
| LOXIA CURVIROSTRA | RED CROSSBILL | G5 | SU | | |
| LUCANIA GOODEI | BLUEFIN KILLIFISH | G5 | S1 | | U |
| LUCANIA PARVA | RAINWATER KILLIFISH | G5 | S1 | | |
| LUXILUS COCCOGENIS | WARPAINT SHINER | G5 | S3 | | |
| LYTHRURUS ARDENS | ROSEFIN SHINER | G5 | S1 | | |
| LYTHRURUS ATRAPICULUS | BLACKTIP SHINER | G4 | S2 | | |
| LYTHRURUS BELLUS | PRETTY SHINER | G5 | S2 | | T |
| LYTHRURUS LIRUS | MOUNTAIN SHINER | G4 | S3 | | |
| MACRHYBOPSIS STORERIANA | SILVER CHUB | G5 | S2 | | |
| MACROCLEMYS TEMMINCKII | ALLIGATOR SNAPPING TURTLE | G3 | S3 | C2 | T |
| MARSTONIA AGARHECTA | OCMULGEE MARSTONIA | G1G3 | S1S3 | C2 | |
| MARSTONIA CASTOR | BEAVERPOND MARSTONIA | G1G3 | S1S3 | C2 | |
| MEDIONIDUS ACUTISSIMUS | ALABAMA MOCCASINSHELL | G1 | S? | | T |
| MEDIONIDUS PARVULUS | COOSA MOCCASINSHELL | G? | S? | | E |
| MEGAPTERA NOVAEANGLIAE | HUMPBACK WHALE | G2 | SN | LE | E |
| MENIDIA BERYLLINA | TIDEWATER SILVERSIDE | G5 | S2 | | |
| MICROPTERUS NOTIUS | SUWANNEE BASS | G2G3 | S1 | | R |
| MICRURUS FULVIUS | EASTERN CORAL SNAKE | G5 | S3 | | |
| MOXOSTOMA CARINATUM | RIVER REDHORSE | G4 | S1 | | R |
| MOXOSTOMA LACHNERI | GREATER JUMPROCK | G3? | S3 | | |
| MOXOSTOMA ROBUSTUM | SMALLFIN REDHORSE | G3G4 | S3 | | |
| MOXOSTOMA SP. CF CARINATUM | ATLANTIC RIVER REDHORSE | G? | S? | | E |
| MYCTERIA AMERICANA | WOOD STORK | G5 | S2 | LE | E |
| MYOTIS AUSTRORIPARIUS | SOUTHEASTERN BAT | G4 | S3S4 | C2 | |
| MYOTIS GRISESCENS | GRAY MYOTIS | G2 | S1 | LE | E |
| MYOTIS LEIBII | EASTERN SMALL-FOOTED MYOTIS | G3 | S2? | C2 | |
| MYOTIS SODALIS | INDIANA MYOTIS | G2 | SA | LE | E |
| NECTURUS ALABAMENSIS | ALABAMA WATERDOG | G4Q | S2 | | |
| NECTURUS MACULOSUS | MUDPUPPY | G5 | S1 | | |
| NECTURUS PUNCTATUS | DWARF WATERDOG | G4 | S2 | | |
| NEOFIBER ALLENI | ROUND-TAILED MUSKRAT | G3? | S3S4 | C2 | T |
| NEOTOMA FLORIDANA HAEMATOREIA | EASTERN WOODRAT | G5T5 | S5 | C2 | |
| NEOTOMA FLORIDANA ILLINOENSIS | EASTERN WOODRAT | G5T5 | S5 | | |
| NERODIA FLORIDANA | FLORIDA GREEN WATER SNAKE | G5Q | S2 | | |
| NICROPHORUS AMERICANUS | AMERICAN BURYING BEETLE | G1 | S? | LE | |
| NOTOPHTHALMUS PERSTRIATUS | STRIPED NEWT | G3 | S2 | | R |
| NOTROPIS ALTIPINNIS | HIGHFIN SHINER | G5 | S1 | | |
| NOTROPIS ARIOMMUS | POPEYE SHINER | G3 | S1 | | T |
| NOTROPIS ASPERIFRONS | BURRHEAD SHINER | G4 | S3 | | |
| NOTROPIS ATHERINOIDES | EMERALD SHINER | G5 | S1 | | |
| NOTROPIS CHROSOMUS | RAINBOW SHINER | G4 | S3 | | |
| NOTROPIS HARPERI | REDEYE CHUB | G4 | S1 | | R |
| NOTROPIS HYPSILEPIS | HIGHSCALE SHINER | G3 | S2S3 | | T |
| NOTROPIS LEUCIODUS | TENNESSEE SHINER | G5 | S3 | | |
| NOTROPIS PHOTOGENIS | SILVER SHINER | G5 | S1 | | E |
| NOTROPIS RUBELLUS | ROSYFACE SHINER | G5 | S1 | | |

# SPECIAL ANIMALS OF GEORGIA

## GEORGIA DEPARTMENT OF NATURAL RESOURCES, WILDLIFE RESOURCES DIVISION, GEORGIA NATURAL HERITAGE PROGRAM

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | STATE RANK | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|---|---|
| NOTROPIS SCEPTICUS | SANDBAR SHINER | G4 | S2 | | R |
| NOTROPIS SPECTRUNCULUS | MIRROR SHINER | G4 | S3 | | |
| NOTROPIS STILBIUS | SILVERSTRIPE SHINER | G4? | S3 | | |
| NOTROPIS TELESCOPUS | TELESCOPE SHINER | G5 | S2 | | |
| NOTROPIS VOLUCELLUS | MIMIC SHINER | G5 | S2 | | |
| NOTURUS ELEUTHERUS | MOUNTAIN MADTOM | G5 | S1 | | T |
| NOTURUS FLAVIPINNIS | YELLOWFIN MADTOM | G2 | SH | LTXN | |
| NOTURUS FUNEBRIS | BLACK MADTOM | G5 | S1S2 | | R |
| NOTURUS MUNITUS | FRECKLEBELLY MADTOM | G3 | S1 | C2 | E |
| NOTURUS NOCTURNUS | FRECKLED MADTOM | G5 | SH | | E |
| NYCTANASSA VIOLACEA | YELLOW-CROWNED NIGHT-HERON | G5 | S3S4 | | |
| NYCTICORAX NYCTICORAX | BLACK-CROWNED NIGHT-HERON | G5 | S3S4 | | |
| ODOCOILEUS VIRGINIANUS NIGRIBARBIS | BLACKBEARD'S WHITETAILED DEER | G5T1Q | S? | C2 | |
| ONTHOPHAGUS POLYPHEMI | ONTHOPHAGUS TORTOISE COMMENSAL SCARAB BEETLE | G? | S? | C2 | |
| OPHISAURUS ATTENUATUS | SLENDER GLASS LIZARD | G5 | S3 | | |
| OPHISAURUS COMPRESSUS | ISLAND GLASS LIZARD | G4 | S2 | C2 | |
| OPHISAURUS MIMICUS | MIMIC GLASS LIZARD | G3 | S2 | | |
| PANDION HALIAETUS | OSPREY | G5 | S3 | | |
| PASSERCULUS SANDWICHENSIS | SAVANNAH SPARROW | G5 | S5 | | |
| PERCINA ANTESELLA | AMBER DARTER | G2 | S1 | LE | E |
| PERCINA AURANTIACA | TANGERINE DARTER | G3G4 | S1 | | T |
| PERCINA AUROLINEATA | GOLDLINE DARTER | G2 | S1 | C2 | T |
| PERCINA EVIDES | GILT DARTER | G4 | S3 | | |
| PERCINA JENKINSI | CONASAUGA LOGPERCH | G1 | S1 | LE | E |
| PERCINA LENTICULA | FRECKLED DARTER | G2 | S1 | C2 | E |
| PERCINA MACULATA | BLACKSIDE DARTER | G5 | S1 | | |
| PERCINA PALMARIS | BRONZE DARTER | G3 | S1S2 | | |
| PERCINA SCIERA | DUSKY DARTER | G5 | S1 | | R |
| PERCINA SHUMARDI | RIVER DARTER | G5 | S1 | | E |
| PERCINA SP. CF MACROCEPHALA | MUSCADINE DARTER | G? | S? | | R |
| PERCINA SQUAMATA | OLIVE DARTER | G3 | S1 | C2 | T |
| PERCINA TANASI | SNAIL DARTER | G2 | S1 | LT | T |
| PEROMYSCUS GOSSYPINUS ANASTASAE | ANASTASIA ISLAND COTTON MOUSE | G5T1Q | S? | | |
| PETROMYZON MARINUS | SEA LAMPREY | G5 | S3 | | |
| PHENACOBIUS CATOSTOMUS | RIFFLE MINNOW | G4? | S3 | | |
| PHENACOBIUS CRASSILABRUM | FATLIPS MINNOW | G3 | S1 | | E |
| PHENACOBIUS URANOPS | STARGAZING MINNOW | G4 | S1 | | T |
| PHYCIODES BATESII | TAWNY CRESCENT BUTTERFLY | G3G4 | SH | C2 | |
| PHYSETER MACROCEPHALUS | SPERM WHALE | G2 | S? | LE | |
| PICOIDES BOREALIS | RED-COCKADED WOODPECKER | G2 | S2 | LE | E |
| PIMEPHALES NOTATUS | BLUNTNOSE MINNOW | G5 | S2? | | |
| PIMEPHALES VIGILAX | BULLHEAD MINNOW | G5 | S2 | | |
| PITUOPHIS MELANOLEUCUS MELANOLEUCUS | NORTHERN PINE SNAKE | G5T? | S? | C2 | |
| PLECOTUS RAFINESQUII | RAFINESQUE'S BIG-EARED BAT | G4 | S3? | C2 | R |
| PLEGADIS FALCINELLUS | GLOSSY IBIS | G5 | S2S3 | | |
| PLETHODON DORSALIS | ZIGZAG SALAMANDER | G5Q | S1 | | |
| PLETHODON PETRAEUS | PIGEON MOUNTAIN SALAMANDER | G1G2 | S1S2 | | R |
| PLETHODON TEYAHALEE | SOUTHERN APPALACHIAN SLIMY SALAMANDER | G3 | S1 | | |

# SPECIAL ANIMALS OF GEORGIA

## GEORGIA DEPARTMENT OF NATURAL RESOURCES, WILDLIFE RESOURCES DIVISION, GEORGIA NATURAL HERITAGE PROGRAM

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | STATE RANK | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|---|---|
| PLETHODON WEBSTERI | WEBSTER'S SALAMANDER | G3Q | S1 | | |
| PLEUROBEMA DECISUM | SOUTHERN CLUBSHELL | G1G2 | S? | | E |
| PLEUROBEMA GEORGIANUM | SOUTHERN PIGTOE | G? | S? | | E |
| PLEUROBEMA PEROVATUM | OVATE CLUBSHELL | G? | S? | | E |
| PROBLEMA BULENTA | RARE SKIPPER | G2G3 | S1? | C2 | |
| PSEUDACRIS BRIMLEYI | BRIMLEY'S CHORUS FROG | G5 | S2 | | |
| PSEUDEMYS NELSONI | FLORIDA REDBELLY TURTLE | G5 | S2 | | |
| PSEUDIRON MERIDIONALIS | MERIDION BLACKWATER MAYFLY | G? | S? | 3B | |
| PSEUDOBRANCHUS STRIATUS | DWARF SIREN | G5 | S3 | | |
| PSEUDORCA CRASSIDENS | FALSE KILLER WHALE | G? | SN | | |
| PSEUDOTRITON MONTANUS | MUD SALAMANDER | G5 | S3 | | |
| PTERONOTROPIS EURYZONUS | BROADSTRIPE SHINER | G3 | S1 | | R |
| PTERONOTROPIS HYPSELOPTERUS | SAILFIN SHINER | G5 | S3 | | |
| PTERONOTROPIS WELAKA | BLUENOSE SHINER | G4 | S1 | | R |
| PTYCHOBRANCHUS GREENI | TRIANGULAR KIDNEYSHELL | G1 | S? | | E |
| RANA AREOLATA | CRAWFISH FROG | G4 | S3 | | |
| RANA SYLVATICA | WOOD FROG | G5 | S2 | | |
| RANA VIRGATIPES | CARPENTER FROG | G5 | S3 | | |
| REGINA ALLENI | STRIPED CRAYFISH SNAKE | G5 | S2 | | |
| RHADINAEA FLAVILATA | PINE WOODS SNAKE | G4 | S2 | | |
| ROSTRHAMUS SOCIABILIS | SNAIL KITE | G4? | SA | | |
| RYNCHOPS NIGER | BLACK SKIMMER | G5 | S2 | | |
| SCIURUS NIGER SHERMANI | SHERMAN'S FOX SQUIRREL | G5T2 | S? | C2 | |
| SEMINATRIX PYGAEA | BLACK SWAMP SNAKE | G5 | S3 | | |
| SOMATOGYRUS TENAX | SAVANNAH PEBBLESNAIL | G1G3 | S1S3 | C2 | |
| SOREX CINEREUS | MASKED SHREW | G5 | S1S2 | | |
| SOREX HOYI | PYGMY SHREW | G5 | S1? | | |
| STENELLA FRONTALIS | ATLANTIC SPOTTED DOLPHIN | G? | SN | | |
| STERNA ANTILLARUM | LEAST TERN | G4 | S2S3 | | R |
| STERNA DOUGALLII | ROSEATE TERN | G3 | S? | LELT | |
| STERNA MAXIMA | ROYAL TERN | G5 | S5 | | |
| STERNA NILOTICA | GULL-BILLED TERN | G5 | S1 | | T |
| STORERIA VICTA | FLORIDA BROWN SNAKE | G4G5Q | SU | | |
| SYLVILAGUS TRANSITIONALIS | NEW ENGLAND COTTONTAIL | G4 | S1S2 | C2 | R |
| TAMIASCIURUS HUDSONICUS | RED SQUIRREL | G5 | S3 | | |
| THRYOMANES BEWICKII | BEWICK'S WREN | G5 | SU | | R |
| TRICHECHUS MANATUS | MANATEE | G2? | S1S2 | LE | E |
| TRIONYX MUTICUS | SMOOTH SOFTSHELL | G5 | SRS1 | | |
| TROGLODYTES TROGLODYTES | WINTER WREN | G5 | S2S3 | | |
| TYPHLICHTHYS SUBTERRANEUS | SOUTHERN CAVEFISH | G3 | S2S3 | | R |
| TYRANNUS DOMINICENSIS | GRAY KINGBIRD | G5 | S2S3 | | |
| UMBRA PYGMAEA | EASTERN MUDMINNOW | G5 | S3 | | |
| VERMIVORA BACHMANII | BACHMAN'S WARBLER | G1 | S1 | LE | E |

Can be used for
look w. potentials



# SPECIAL ANIMALS OF LOWNDES COUNTY

**This list was compiled in January 1994 and represents both potential and known occurrences of special animals (rare and/or protected in Georgia) for Lowndes County. Source: Georgia Dept. of Natural Resources, Wildlife Resources Division, Gerogia Natural Heritage Program.**

| Animal | Habitat |
|---|---|
| *Acantharchus pomotis* | Blackwater streams; bays; cypress/gum ponds |
| * *Aimophila aestivalis* | Open pine or oak woods; old fields; brushy areas |
| * *Ambystoma cingulatum* | Pine flatwoods; moist savannahs; cypress/gum ponds |
| *Ammodramus henslowii* | Fields; meadows |
| *Botaurus lentiginosus* | Marshes; lakes |
| *Condylura cristata* | Moist meadows; woods; swamps |
| *Cyprinella callisema* | Blackwater & brownwater streams |
| *Cyprinella leedsi* | Blackwater & brownwater streams |
| * *Drymarchon corais couperi* | Sandhills; pine flatwoods; dry hammocks |
| * *Elanoides forficatus* | River swamps; marshes |
| * *Enneacanthus chaetodon* | Blackwater streams; bays; cypress/gum ponds |
| *Eumeces egregius* | Coastal dunes; longleaf pine-turkey oak woods; dry hammocks |
| *Farancia erytrogramma* | River swamps; springs; sandy fields near water |
| *Fundulus chrysotus* | Blackwater streams; ponds; bays; brackish streams |
| * *Fundulus cingulatus* | Blackwater streams; ponds; bays; freshwater marshes |
| * *Gopherus polyphemus* | Sandhills; dry hammocks; longleaf pine-turkey oak woods |
| *Grus canadensis* | Freshwater marshes; bays; fields |
| *Heterodon simus* | Open, sandy woods; fields; floodplains |
| *Kinosternon baurii* | River swamps; sloughs; ponds; marshes |
| *Lanius ludovicianus migrans* | Open woods; field edges |
| *Lasiurus intermedius* | Wooded areas near open water or fields |
| *Lucania parva* | Ponds; creeks |
| * *Micropterus notius* | Springs; rocky shoals; blackwater streams |
| *Micrurus fulvius* | Hardwood forests; pine flatwoods; dry hammocks; marshes |
| * *Mycteria americana* | Cypress/gum ponds; marshes; river swamps; bays |
| *Myotis austroriparius* | Caves and buildings near water |
| * *Neofiber alleni* | Freshwater marshes; bogs |
| *Nerodia floridana* | Swamps; marshes; limesink ponds; bays |
| * *Notophthalmus perstriatus* | Pine flatwoods; ponds; ditches |
| *Nyctanassa violacea* | River swamps; marshes; cypress/gum ponds |
| *Nycticorax nycticorax* | River swamps; marshes; cypress/gum ponds |
| *Ophisaurus attenuatus* | Open woods; savannahs; old fields; edges of streams & ponds; sandhills |
| *Ophisaurus compressus* | Sandhills; pine flatwoods; barrier island scrub forests |

* = State-protected species

## SPECIAL ANIMALS OF LOWNDES COUNTY

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| | Animal | Habitat |
|---|---|---|
| | *Ophisaurus mimicus* | Pine flatwoods |
| | *Pandion haliaetus* | Lakes; rivers; seacoasts |
| * | *Picoides borealis* | Open pine woods; pine savannahs |
| | *Pituophis melanoleucus mugitus* | Upland forests; grasslands; floodplains; old fields |
| | *Pseudobranchus striatus* | Swamps; marshes; limesink ponds; bays |
| | *Pseudotriton montanus* | Swamps; muddy seeps; springs |
| | *Pteronotropis hypselopterus* | Blackwater & brownwater streams |
| | *Rana areolata* | Floodplains; wet meadows; pastures; ponds |
| | *Rana virgatipes* | Swamps; bogs; blackwater streams; ponds |
| | *Regina alleni* | Freshwater marshes; bogs; ponds; blackwater streams |
| | *Seminatrix pygaea* | Swamps; ponds; marshes; lakes |
| | *Storeria victa* | Swamps; bogs; fields; moist woods |
| | *Umbra pygmaea* | Muddy streams & ponds |

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# SPECIAL PLANTS OF LOWNDES COUNTY

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| Plants | Habitat |
|---|---|
| *Agalinis aphylla* | Longleaf pine-wiregrass savannahs; pine flatwoods |
| *Agalinis divaricata* | Dry, grassy, pine-scrub oak ridges |
| *Agalinis filicaulis* | Seasonally wet, longleaf pine-wiregrass savannahs; pine flatwoods |
| *Agalinis georgiana* | Dry, grassy, pine-scrub oak ridges |
| *Agrimonia incisa* | Mixed oak-hickory forests, dry pine forests |
| *Amorpha georgiana* | Dry pine-wiregrass savannahs |
| *Amphicarpum muhlenbergianum* | Pine flatwoods |
| *Andropogon mohrii* | Longleaf pine-wiregrass savannahs; pine-cypress savannahs |
| *Apteria aphylla* | Mesic hardwoods or magnolia-beech bluff forests |
| *Aristida condensata* | Ohoopee Dunes; pine barrens |
| *Aristida simpliciflora* | Longleaf pine-wiregrass savannahs |
| *Asclepias pedicellata* | Bogs, wet savannahs |
| *Asclepias rubra* | Bogs, wet savannahs |
| *Asimina pygmaea* | Flatwoods, wet savannahs |
| *Asimina reticulata* | Flatwoods, wet savannahs |
| *Baccharis glomeruliflora* | Hammocks; moist woods; swamps |
| * *Balduina atropurpurea* | Wet savannahs, pitcherplant bogs |
| *Baptisia lecontei* | Pineland scrub |
| *Befaria racemosa* | Pine flatwoods; pine-oak scrub |
| *Callirhoe triangulata* | Sandy scrub |
| *Calopogon multiflorus* | Wet savannahs; pitcherplant bogs |
| *Calystegia catesbiana ssp. catesbiana* | Longleaf pine-wiregrass savannahs |
| * *Carex dasycarpa* | Evergreen hammocks; bluff forests |
| *Carex decomposita* | Swamps and lake margins on floating logs & stumps |
| *Carex fissa var. aristata* | Wet savannahs |
| *Ceanothus microphyllus* | Longleaf pine-wiregrass savannahs |
| *Cenchrus myosuroides* | Sandy clearings |
| *Cladium mariscoides* | Bogs & marshes |
| *Coreopsis integrifolia* | Floodplain forests, streambanks |
| *Crinum americanum* | Swamps |
| *Eleocharis robbinsii* | Pine savannah ponds |
| *Elytraria caroliniensis* | Floodplain hardwoods; usually calcareous |
| * *Epidendrum conopseum* | Altamaha Grit outcrops, also mesic hardwood or magnolia-beech bluff forests |
| *Eragrostis secundiflora* | Beaches & dunes; sandy soils |

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## SPECIAL PLANTS OF LOWNDES COUNTY

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| Plants | Habitat |
|---|---|
| *Eriocaulon texense* | Altamaha grit outcrops; wet pine savannahs |
| *Eryngium aromaticum* | Dry pinelands; longleaf pine-wiregrass savannahs |
| *Eulophia ecristata* | Dry palmetto fields; grassy areas |
| *Fimbristylis decipiens* | Wet pine savannahs |
| *Fimbristylis tomentosa* | Bogs; Granite outcrops |
| * *Fothergilla gardenii* | Openings in low woods; swamps |
| *Fuirena scirpoidea* | Pineland depressions |
| *Galactia floridana* | Pine flatwoods |
| *Glyceria septentrionalis* | Cypress ponds |
| *Gratiola subulata* | Longleaf pine-wiregrass savannahs |
| *Habenaria quinqueseta var. quinqueseta* | Altamaha Grit outcrops; open pine woods |
| *Helianthus agrestis* | Pine savannahs; mucky, wet soils |
| *Helianthus heterophyllus* | Bogs |
| *Hibiscus coccineus* | Marshes; sloughs |
| *Illicium parviflorum* | Evergreen hammocks, bayheads |
| *Ipomoea macrorhiza* | Exposed sandy soils |
| *Krameria lanceolata* | Longleaf pine-wiregrass sandridges |
| *Lachnocaulon beyrichianum* | Flatwoods |
| *Lechea deckertii* | Scrub |
| *Lechea torreyi* | Flatwoods; pond margins; scrub |
| *Leitneria floridana* | Swamps; sawgrass-cabbage palmetto marshes |
| *Listera australis* | Moist rhododendron thickets |
| * *Litsea aestivalis* | Cypress ponds; swamp margins |
| *Lobelia boykinii* | Cypress ponds & wet savannahs |
| *Lophiola aurea* | Pine flatwoods, bogs |
| *Macbridea caroliniana* | Wet savannahs, flatwoods |
| *Macranthera flammea* | Wet, sandy thickets; bogs |
| *Malaxis spicata* | Low hammocks; spring-fed river swamps |
| * *Matelea alabamensis* | Open bluff forests |
| *Matelea flavidula* | Open bluff forests; floodplain forests |
| * *Matelea pubiflora* | Exposed sandy soils; sandridges |
| *Micromeria brownei var. pilosiuscula* | Floodplain forests |
| *Mimosa strigillosa* | Floodplain forests; wet, grassy openings |
| *Myrica inodora* | Bayheads, titi swamps |
| * *Myriophyllum laxum* | Bluehole springs; shallow ponds & whitewater creeks |
| *Oldenlandia boscii* | Cypress pond margins; wet savannahs |
| *Oxypolis ternata* | Wet pine savannahs |

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# SPECIAL PLANTS OF LOWNDES COUNTY

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| Plants | Habitat |
|---|---|
| *Palafoxia integrifolia* | Pine-oak scrub |
| *Panicum tenerum* | Wet pine savannahs |
| *Paspalum giganteum* | Flatwoods; wet hammocks |
| *Peltandra sagittifolia* | Swamps; wet hammocks |
| *Pentodon pentandrus* | Wet meadows; pond edges |
| *Phaseolus sinuatus* | Sandhills; dry pinelands & hammocks |
| *Phlebodium aureum* | Exposed calcareous soil; also epiphytic on live oak & sabal palmetto |
| * *Physostegia leptophylla* | Wet savannahs, bogs |
| *Pieris phyllyreifolia* | Cypress ponds; epiphytic on cypress bark |
| *Pinckneya pubens* | Flatwoods; wet, sandy thickets |
| *Plantago sparsiflora* | Marshy pinelands |
| *Platanthera integra* | Wet savannahs, pitcherplant bogs |
| *Platanthera nivea* | Wet savannahs, pitcherplant bogs |
| *Pleea tenuifolia* | Wet pine savannahs; margins of cypress ponds |
| *Polanisia tenuifolia* | Sandridges; scrub |
| *Polygala balduinii* | Wet pine savannahs |
| *Polygala leptostachys* | Oak-pine scrub |
| *Ponthieva racemosa* | Calcareous swamps; marly outcrops |
| *Psilocarya corymbifera* | Floating mats in ponds & pond margins |
| *Psilotum nudum* | Swamp forests & hammocks; usually epiphytic |
| *Pycnanthemum floridanum* | Pine savannahs; flatwoods |
| *Quercus austrina* | Bluff forests; floodplain hammocks |
| *Quercus chapmanii* | Sandridges; dunes; oak-pine scrub |
| *Rhapidophyllum hystrix* | Floodplain terraces and adjacent lower slopes; crests of steep ravines |
| *Rhexia aristosa* | Pond margins & wet savannahs |
| *Rhexia nuttallii* | Pine flatwoods; bogs |
| *Rhododendron austrinum* | Hardwood-spruce pine forests; low woods |
| *Rhynchospora breviseta* | Bogs |
| *Rhynchospora careyana* | Sag ponds; cypress ponds; pine flatwoods |
| *Rhynchospora decurrens* | Swamps |
| *Rhynchospora harperi* | Cypress pond margins & wet savannahs |
| *Rhynchospora macra* | Seepage slopes; wet savannahs |
| *Rhynchospora oligantha* | Bogs |
| *Rhynchospora pleiantha* | Pond margins; wet savannahs |
| *Rhynchospora punctata* | Wet savannahs, pitcherplant bogs |

* = State-protected species

## SPECIAL PLANTS OF LOWNDES COUNTY

**This list was compiled in January 1994 and represents both potential and known occurrences of special plants (rare and/or protected in Georgia) for Lowndes County. Source: Georgia Dept. of Natural Resources, Wildlife Resources Division, Gerogia Natural Heritage Program.**

| Plants | Habitat |
|---|---|
| *Rhynchospora solitaria* | Wet, sandy, peaty depressions |
| *Rhynchospora stenophylla* | Pine savannahs |
| *Rhynchospora torreyana* | Bogs; wet savannahs |
| *Ruellia noctiflora* | Open, pine flatwoods |
| *Sagittaria teres* | Sandy ponds & bogs |
| * *Sarracenia flava* | Wet savannahs, pitcherplant bogs |
| * *Sarracenia minor* | Wet savannahs, pitcherplant bogs |
| * *Sarracenia psittacina* | Wet savannahs, pitcherplant bogs |
| *Sium suave* | Swamps |
| *Solidago tarda* | Sandy upland forests |
| *Spiranthes brevilabris* | Open pinelands; meadows |
| *Spiranthes longilabris* | Wet pinelands & prairies |
| *Spiranthes ovalis* | Moist hammocks; swamp margins; wet thickets over basic soils |
| *Sporobolus teretifolius* | Longleaf pine-wiregrass savannahs |
| *Stillingia aquatica* | Cypress ponds; flatwood ponds & shallow sloughs |
| *Stokesia laevis* | Pitcherplant bogs |
| *Tephrosia chrysophylla* | Scrub; pine flatwoods |
| *Thelypteris ovata* | Calcareous hammocks; limesinks; mesic hardwood forests |
| *Tillandsia bartramii* | Epiphytic in moist forests |
| *Tillandsia setacea* | Epiphytic in bluff forests on evergreen hardwoods |
| *Tillandsia utriculata* | Epiphytic in evergreen hammocks |
| *Tofieldia glabra* | Wet pine savannahs |
| *Utricularia olivacea* | Shallow ponds |
| *Uvularia floridana* | Mixed oak-hickory forests; mesic hardwoods or magnolia-beech bluff forests |
| *Vernonia pulchella* | Pine savannahs; pine flatwoods |
| *Vitis munsoniana* | Floodplain forests; blackwater streamsides |
| *Vitis palmata* | Floodplain forests; river banks |
| *Warea cuneifolia* | Sandhills scrub |
| *Xyris drummondii* | Pine flatwoods |
| *Xyris scabrifolia* | Sedge bogs; pitcherplant bogs; pine flatwoods |
| *Xyris serotina* | Sandy pinelands |
| *Xyris stricta* | Acidic swamps |
| *Zephyranthes simpsonii* | Pine flatwoods |
| *Zigadenus leimanthoides* | Sandhill bogs; pine flatwoods |

* = State-protected species

## EXPLANATION OF RARITY RANKS AND STATUS

The "Global Rank" and "State Rank" columns indicate relative rarity of species at the rangewide or global level and the Georgia or state level, respectively. An explanation of these ranks and of federal and state protection status follows.

STATE [GLOBAL] RANK:

| | | |
|---|---|---|
| S1[G1] | = | Critically imperiled in state [globally] because of extreme rarity (5 or fewer occurrences). |
| S2[G2] | = | Imperiled in state [globally] because of rarity (6 to 20 occurrences). |
| S3[G3] | = | Rare or uncommon in state [rare and local throughout range or in a special habitat] (on the order of 21 to 100 occurrences). |
| S4[G4] | = | Apparently secure in state [globally]. |
| S5[G5] | = | Demonstrably secure in state [globally]. |
| SA | = | Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals. |
| SN | = | Regularly occurring, usually migratory and typically nonbreeding species. |
| SR | = | Reported from the state, but without persuasive documentation. |
| SU[GU] | = | Possibly in peril in state [range-wide] but status uncertain; need more information on threats. |
| SX[GX] | = | Apparently extirpated from state [extinct throughout range]. GXC is known only in cultivation/captivity. |
| SE | = | An exotic established in state; may be native elsewhere in North America; sometimes nativity is difficult to determine (SE?). |
| SH[GH] | = | Of historical occurrence in the state [throughout its range], perhaps not verified in the past 20 years, but suspected to be still extant. |

FEDERAL STATUS:

| | | |
|---|---|---|
| LE | = | Listed endangered. The most critically threatened species. A species that may become extinct or disappear from a significant part of its range if not immediately protected. |

| | | |
|---|---|---|
| LT | = | Listed threatened. The next most critical level of threatened species. A species that may become endangered if not protected. |
| PE or PT | = | Candidate species currently proposed for listing as endangered or threatened. |
| C1 | = | Candidate species presently under status review for federal listing for which adequate information exists on biological vulnerability and threats to list the taxa as endangered or threatened. |
| C2 | = | Candidate species presently under status review for federal listing for which information indicates that listing as endangered or threatened is possibly appropriate, but for which adequate data on biological vulnerability and threats are not currently known or on file to support proposed rules. |
| 3A, 3B, 3C | = | Formerly candidate species; presently delisted. |

STATE STATUS:

The following abbreviations are used to indicate the status of state-protected plants and animals or those proposed for state-protection in Georgia.

| | | |
|---|---|---|
| E | = | Listed as endangered. |
| T | = | Listed as threatened. |
| U | = | Listed as unusual (and thus deserving of special consideration). |
| PE | = | Proposed endangered. |
| PT | = | Proposed threatened. |
| PU | = | Proposed unusual. |

NOTE: This is a working list and is constantly revised. For the latest changes, acknowledgement of numerous sources, interpretation of data, or other information connected with this list, please contact: Georgia Department of Natural Resources, Georgia Natural Heritage Program, 2117 Hwy 278 SE, Social Circle, GA 30279, 706-557-3032 and 404-918-6411.

The proper citation for this list is:

Georgia Natural Heritage Program. [Edition date from top right corner]. [Title from top center]. Georgia Department of Natural Resources, Social Circle.

# OVERSIZED

# DOCUMENT

# SITE INVESTIGATION REPORT

# WOOLFOLK CHEMICAL WORKS - LENOX WAREHOUSE

# LENOX, GEORGIA

# GAD082832841

Jeffrey M. Williams
Remedial Action Unit
Georgia Environmental Protection Division
February 1985

# Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION

Rec'd. 4/19/85

from the desk of

**Tom Westbrook**

10APR85

Ron –

As requested attached is a copy (complete, with the exception of App. E) of the Site Inspection Report. This is for your files.

(App. E is 25 pages of the warehouse inventory data at the time of the fire.)

If you need it (App. E) we can get it to you.

Tom

WOOLFOLK CHEMICAL WORKS - LENOX WAREHOUSE

SITE INVESTIGATION REPORT

TABLE OF CONTENTS


1.0 Executive Summary.....1

2.0 Background.....3

2.1 Location.....3
2.2 Site Layout.....3
2.3 Ownership History.....3
2.4 Site Use History.....3
2.5 Permit and Regulatory History.....4
2.6 Remedial Actions to Date.....4
2.7 Summary Trip Report.....5

3.0 Environmental Setting.....6

3.1 Topography.....6
3.2 Surface Waters.....6
3.3 Geology and Soils.....6
3.4 Ground Water.....7
3.5 Climate and Meteorology.....8
3.6 Land Use.....8
3.7 Population Distribution.....8
3.8 Water Supply.....8
3.9 Critical Environments.....9

4.0 Waste Types and Quantities.....10

4.1 Waste Quantities.....10
4.2 Waste Disposal Methods and Locations.....10
4.3 Waste Types.....10

5.0 Laboratory Data.....11

5.1 Summary.....11
5.2 Quality Assurance Review.....11

6.0 Toxicology/Chemical Characteristics.....12

WOOLFOLK CHEMICAL WORKS - LENOX WAREHOUSE

SITE INVESTIGATION REPORT

LIST OF FIGURES AND APPENDICES

Figure 1: Site Location.....13

Figure 2: Sample Location Areas.....14

Figure 3: Soil Profile of Site Area.....15

Figure 4: Cook County Map.....16

Table 3.1: Groundwater Quality for City of Adel.....17

Appendix A: Photographs.....18

Appendix B: Laboratory Data.....23

Appendix C: References.....26

Appendix D: Site Inspection Form 2070-13.....27

Appendix E: Inventory Report - Woolfolk Chemicals - Lenox Warehouse.....41

## 1.0 EXECUTIVE SUMMARY

Woolfolk Chemicals - Lenox Warehouse is located in Lenox, Georgia and is composed of 1½ acres of land approximately 1 mile west of Brushy Creek. The warehouse had been a distribution point for a wide variety herbicide and pesticide products from 1976 to 1981 (Appendix E).

In July 1981, a chemical fire at the facility prompted Georgia EPD personnel to respond and supervise the cleanup of the residual materials. Subsequent remedial action by the company removed damaged materials which were transported to a disposal facility in Emelle, Alabama. The owner of the site, Mr. Bobby Lindsey, requested EPD officials to investigate the initial remedial actions at the site.

On August 8, 1984, a site inspection was conducted by Thomas M. Westbrook of the Georgia EPD. A total of four soil samples were collected from areas surrounding the warehouse that were known to receive contaminated wash water from the 1981 chemical fire (Figure 2).

Analysis of the soil samples indicates that there are no leachable contaminants present and the samples are not considered hazardous from the stand point of EP toxicity for toxaphene. Toxaphene values (total concentrations, reported as ppm (mg/kg) dry weight of soil) indicate the presence of this substance in the local environment.

The entire site is located in a residential urban setting with residences present on 3 adjacent sides of the warehouse property. Public access to the site is unrestricted. Surface run-off appears to be the only pathway for contamination to spread, although the extent of contamination is unknown. It is therefore suggested that an assessment study be proposed and implemented to properly evaluate the migration potential of contaminants off the site.

## 2.0 BACKGROUND

### 2.1 Location

Woolfolk Chemical - Lenox Warehouse is located at the intersection of Rentz Avenue and East Colquitt Street, Lenox, Georgia. The site is at latitude 31° 16' 17.0" N and longitude 83° 27' 45.0" W on the Lenox quadrangle 7.5 minute series, USGS map (Figure 1).

### 2.2 Site Layout

The site consists of a 1½ acre tract of land located within the city of Lenox, Georgia, in a residential area. The warehouse building on the site is bordered on the south and east by drainage ditches (Figure 2). Access to the front of the warehouse is from Rentz Avenue.

### 2.3 Ownership History

The facility was originally owned by Mr. D. L. Harpe of Tifton, Georgia. In 1973, the facility was purchased by Bobby Lindsey, who used the facility for a cotton warehouse operation. In the spring of 1976, Mr. Lindsey leased the warehouse building to Woolfolk Chemical Works, Inc. From 1976 to 1981, Woolfolk used the warehouse as a distribution and storage facility for a wide variety of herbicide and pesticide (Agricultural) products. Mr. Lindsey was also employed with Woolfolk Chemical Works from 1976 to 1981.

### 2.4 Site Use History

As stated in section 2.3, from the spring of 1976 to July 1981, the facility was used to store various pesticide and herbicide products.

A fire occurred at the facility on July 1, 1981 after which all wastes were shipped to Chemical Waste Management, Emelle, Alabama, and all salvageable products were removed from the building. No products were subsequently stored on the property.

## 2.5 Permit Regulatory History

Woolfolk Chemicals - Lenox Warehouse has never been required to obtain a permit for the storage of agrichemical products. This facility was a distribution point for Woolfolk Chemicals agricultural products.

## 2.6 Remedial Actions to Date

Personnel from the Georgia Environmental Protection Division first visited the facility in July 1981 in response to a chemical fire on July 1, 1981. A quantity of water used to fight the fire carried some chemicals down a city drainage ditch approximately 0.3 miles from the warehouse. Woolfolk Chemical Works, Inc. contracted with O. H. Materials Company to clean up the chemical spill in the warehouse floor and in the ditches surrounding the warehouse. Wash waters were analyzed before and after filtration to ensure no (future) contamination of soil and water downstream from the facility. On July 31, 1981, approximately 200 cubic yards of residual materials from the Lenox Warehouse fire were shipped to Chemical Waste Management in Emelle, Alabama. The fire fighting waters were treated to remove excessive amounts of toxaphene; however, ditch soils and soils around the building may still be contaminated with residual toxaphene concentrations.

## 2.7 Summary Trip Report

On July 1, 1981, Larry Rogers of the Southwest Georgia Region EPD investigated a chemical fire at the Woolfolk Chemical Works, Inc., Lenox, Georgia. Four samples of the runoff waters from the fire were analyzed for toxaphene and parathion. Ed Cook from the Georgia EPD Emergency Response Team delivered the samples to the GA EPD lab in Atlanta on July 6, 1981 (Appendix B). On July 1, 1981, O. H. Materials Company was contracted for cleanup of approximately 3,000 gallons of contaminated water.

On July 6, 1984, Jennifer Kaduck of the Georgia EPD Facilities Compliance Unit reviewed the files on the cleanup activities at the subject site. The record does not indicate if the warehouse and surrounding soils were ever reinspected to ensure that all wastes were removed. On August 8, 1984, Thomas Westbrook of the Georgia EPD Remedial Action Unit was instructed to inspect and sample the soil areas that may contain high levels of toxaphene. Three soil samples were taken: #1 from the back door, #2 from the front door, and #3 from under the crack in the cement foundation (Appendix A, Photograph 2).

## 3.0 ENVIRONMENTAL SETTING

### 3.1 Topography

Woolfolk Chemicals - Lenox Warehouse is located in the southern central coastal plain area of Georgia. The site is located approximately 1 mile from Brushy Creek at an elevation of 290 feet above mean sea level. Numerous ponds and streams are prevalent throughout the county as a result of the poorly drained plateaus and low lying plains[1] (Figure 1).

The terrain at the site is nearly level. The site is bordered on the south and east sides by storm drainage ditches that are adjacent to the warehouse building (Figure 2). These ditches merge at the southeast corner of the site where they eventually drain some residential sections of the city.

### 3.2 Surface Waters

The New and Withlacoochee Rivers form the eastern boundary of Cook County and the Little River forms the western boundary. Brushy Creek is the closest surface water body near the site (Figure 1). There are no upstream contributing waters or downstream receiving waters near the site. There is presently no information available in reference to the flood potential of the area. There is no stream classification and surface water quality data for Cook County.

### 3.3 Geology and Soils

Soil at the facility is represented by the Leefield series, which consists of somewhat poorly drained soils that have formed in thick beds of loamy material on low uplands.[1]

Soils at the site are low in natural fertility and are very strongly acid throughout.[1] Permeability is moderately slow. The Leefield loamy sand is the dominant soil type at the site and represents a somewhat poorly drained soil. The soils are derived mainly from the Hawthorne Formation, a geologic sedimentary deposit laid down in Miocene times. Cook County has flat terrain, and consequently has extensive ponds and bay areas that result in poor drainage. Top soil is sandy to a depth of 6 inches with a seasonal high water table that is 15 to 30 inches for 2 to 4 months of the year.[1] Loamy sand is found from 0-26 inches, sandy loam from 26-31 inches and sandy clay loam from 31-65 inches.[1] Sand, clay, and limestones of the Miocene age are found at depths from 25 to 400 feet. From 400 to 500 feet - the Ocala limestone occurs and is used as the main water bearing unit for the city of Lenox.[2]

### 3.4 Ground Water

The primary source of water for the Lenox, Georgia area is the principal artesian aquifer. The city of Lenox has two deep water wells that provide drinking water for approximately 966 people.[3] The main water bearing zone consists of the Ocala Limestone and undifferentiated limestones of the Oligocene age.[4] The overlying Miocene series consists of sediments that contain mostly sand and clay with limestone occuring at about 350 feet below land surface. Thickness of the Ocala Limestone at the site is about 173 feet and yields approximately 250 gallons per minute for each of the two municipal deep water wells. Increased precipitation and stream flow in winter and early spring cause high ground water levels. Decreased precipitation and increased evapotranspiration in summer and autumn result in low stream flow and low groundwater levels.[5]

Ground water quality for the city of Adel is given in Table 3.1. Direction of flow is generally south to southeast for the ground water in the principal artesian aquifer.

### 3.5 Climate and Meteorology

The climate of Cook County and the Lenox area is characterized by hot humid summers and mild winters. The average annual rainfall is almost 50 inches. The main climatic influences are the latitude, and the warm waters of the Gulf of Mexico. Fall has less rain and wind than spring with average annual temperature of 67°F.[1]

### 3.6

### Land Use

The site is located within the city limits of Lenox in a residential urban setting. U.S. Census statistics in 1969 estimated 70 percent of Cook County was used for farming. Land usage is generally restricted to agricultural products but industry is gaining importance.[1]

### 3.7

About 55 percent of the population is rural in Cook County. The population within the town of Lenox is 965. The number of residents in the town that use the ground water from the two city wells is 965.[3]

### 3.8 Water Supply

All drinking water within the city of Lenox is pumped from two municipal wells that penetrate the principal artesian aquifer. One well is located at the

intersection of Gray Street and Haze Road and the second well is on Broad Street in the city of Lenox (Figure 1). Approximately 90,000 gallons per day or 32,850,000 gallons per year are metered by the city of Lenox.[3]

### 3.9 Critical Environments

The site is located within 1 mile of Brushy Creek. This creek is the closest body of water to the subject site. There is an extensive floodplain area approximately 4½ to 5 miles east of the site on the New River (Figure 3). There are numerous small fresh water ponds and bays south of the site. Drainage at the site is poor and generally follows a southeasterly course toward Brushy Creek. Contamination of the creek area has not taken place in previous spills around the site due to the poor drainage at the site. The alluvial floodplains of the New River are habitats for the American Alligator and Indigo Snake, both on the Federal Endangered Species List.[5-6]

## 4.0 WASTE TYPES AND QUANTITIES

### 4.1 Waste Quantities

From 1976 to July 1981, Lenox - Woolfolk Chemical Warehouse operated a warehouse distribution center for agrichemical products. A complete inventory of products before the July 1, 1981 fire is listed in Appendix E. No waste was ever generated at the site. There was however a chemical fire on July 1, 1981 in which a release into the environment was observed. Soils surrounding the warehouse building were sampled by Georgia EPD personnel in August 1984 and determined to contain high levels of the compound toxaphene (Appendix B). The quantity of contaminated soil at the site has not been estimated because the extent of contamination is unknown.

### 4.2 Waste Disposal Methods and Locations

All waste waters used in fighting the July 1981 fire were decontaminated by a carbon filtration process. Elevated levels of toxaphene were found in soils at the entrance and exit of the warehouse building (Figure 1).

### 4.3 Waste Types

Georgia EPD lab analyses of the soils around the site revealed excessive quantities of the pesticide toxaphene. Appendix E lists the types of compounds present in the warehouse before the July 1981 fire.

## 5.0 LABORATORY DATA

### 5.1 Summary

On August 8, 1984, Thomas M. Westbrook of the Georgia EPD Remedial Action Unit, took three soil samples at the subject site (Figure 2). Toxaphene was the only parameter reported because the high concentrations masked the identification of other constituents. The toxaphene found in the three samples was evaluated for its leachability into water. There is a maximum EP concentration limit of 500 ppb (ug/L) for toxaphene. According to the August 8, 1984 lab report the samples are not considered hazardous from the standpoint of EP toxicity for toxaphene.

Toxaphene values were also reported as ppm or mg/kg of dry weight of soil. These values represent "total" concentrations. According to CERCLA and the lab analysis it is believed that a reportable quantity of substance has been released into the environment.

### 5.2 Quality Assurance Review

All samples were collected and placed in clean mason jars with an aluminum foil seal inside the lid. All samples were placed on ice until delivery to the EPD lab. EPD lab is covered by an approved QA document.

## 6.0 TOXICOLOGICAL/CHEMICAL CHARACTERISTICS

From the four soil samples collected on August 8, 1984, the following substance has been identified at the site:

Toxaphene - $C_{10}H_{10}Cl_8$ - an amber, waxy solid with a mild odor of chlorine and camphor. Toxic by ingestion, inhalation, and skin absorption.

Oral $LD_{<0}$ (human) = 40 mg/kg, Oral $LD_{50}$ (rat) = 60 mg/kg, and Dermal $LD_{50}$ (rat) = 780 mg/kg.

Lethal oral dose for man is estimated at 2-7 g, a toxicity of about four times that of DDT.

Other compounds that are expected, but not confirmed, to be present at the site are chlordane, parathion, and lindane.

All toxicological data is taken from references 7 and 8.

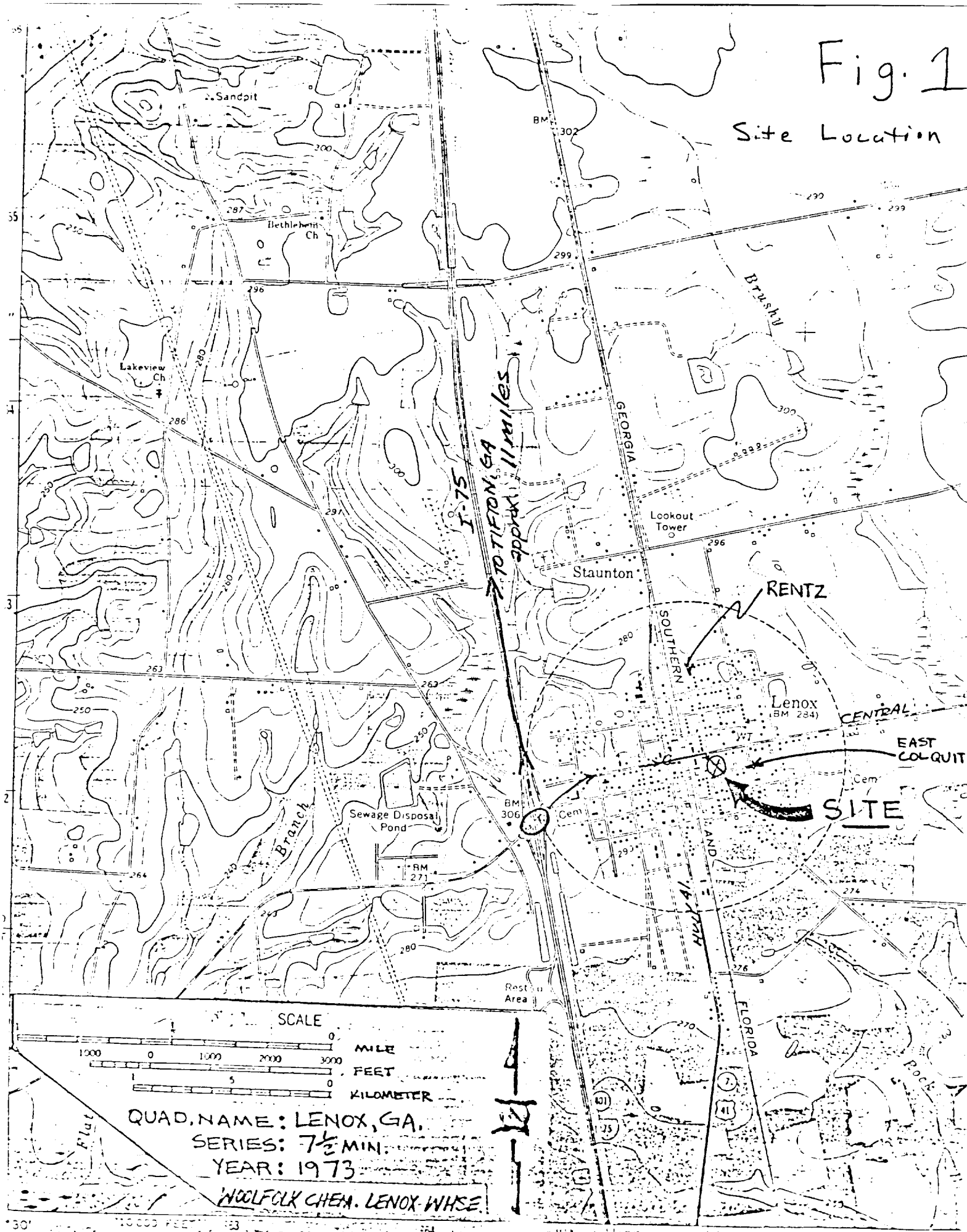


Fig. 1
Site Location
Sandpit
Bethlehem Ch
Lakeview Ch
Brushy
GEORGIA
Lookout Tower
Staunton
I-75
TO TIFTON, GA approx. 11 miles
RENTZ
SOUTHERN
Lenox
(BM 284)
CENTRAL
EAST COLQUIT
SITE
Cem
BM 306
Sewage Disposal Pond
BM 271
Branch
Rest Area
FLORIDA
SCALE
MILE
FEET
KILOMETER
QUAD. NAME: LENOX, GA.
SERIES: 7½ MIN.
YEAR: 1973
WOOLFOLK CHEM. LENOX WHSE.
Mapped, edited, and published by the Geological Survey
Control by USGS, NOS/NOAA, and Georgia Geodetic Survey

Fig. 2

Sample Location Areas

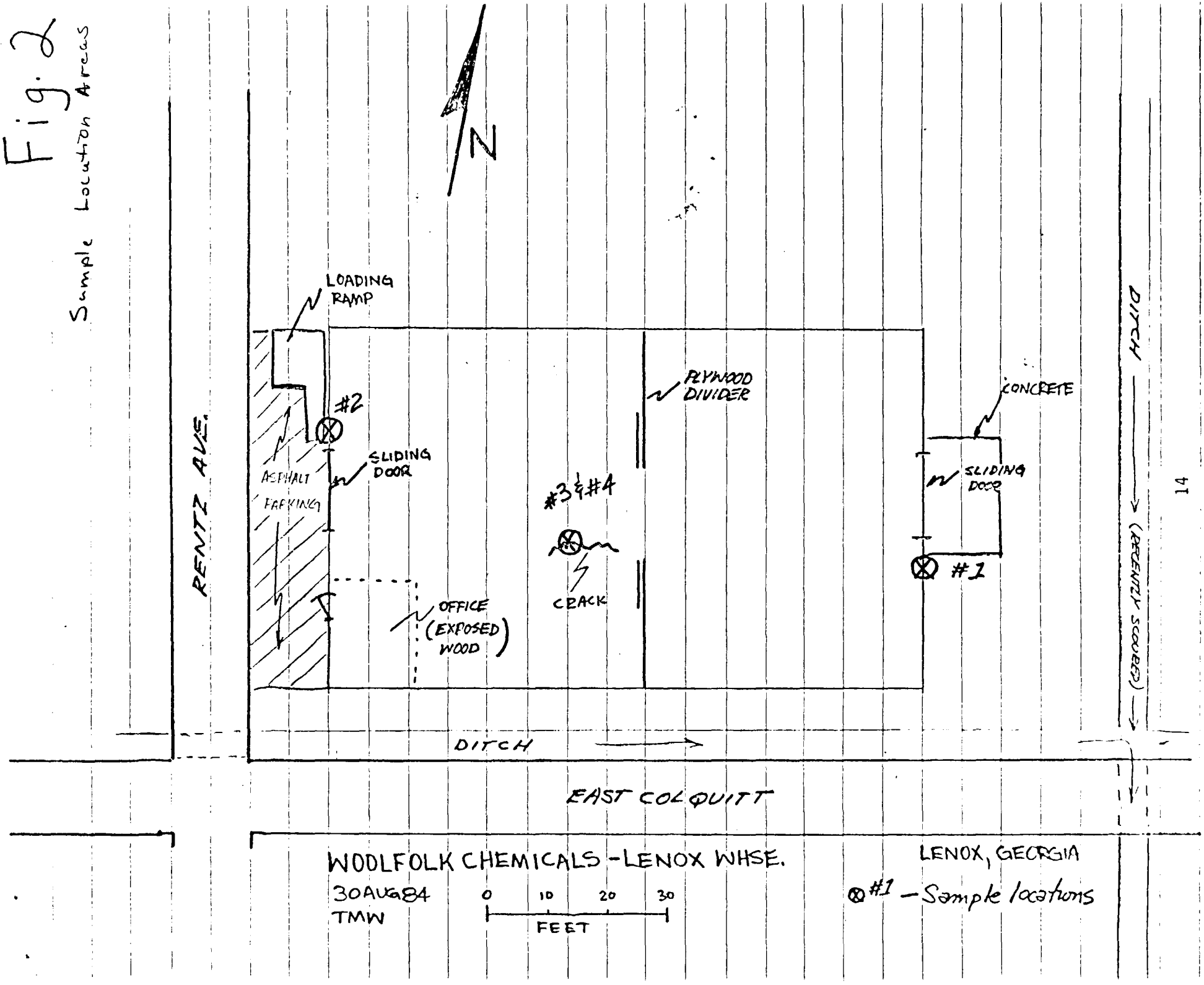


Fig 3

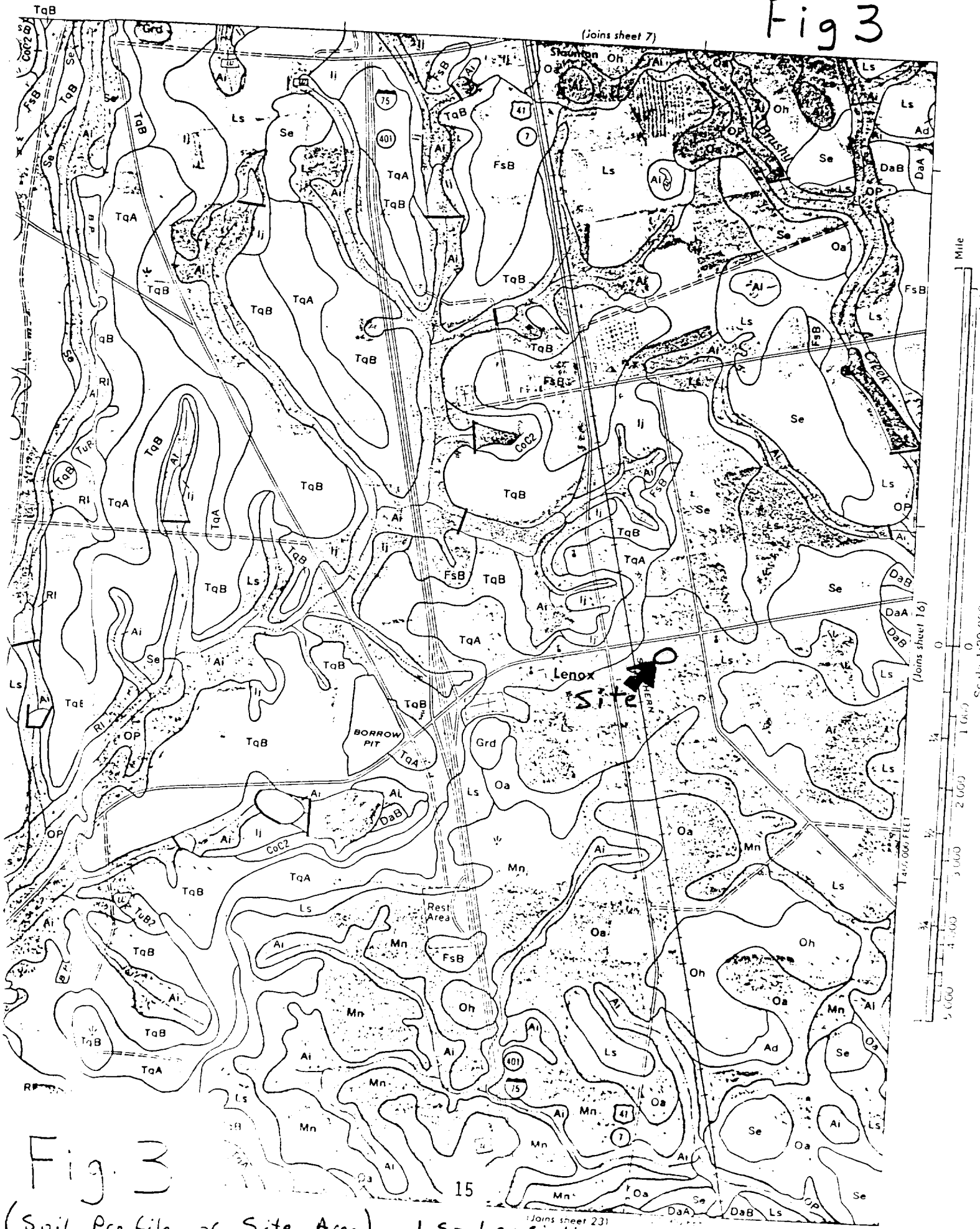



Fig 3



(Soil Profile of Site Area) Ls- Leefield Series

# INDEX TO MAP SHEETS

## COLQUITT AND COOK COUNTIES, GEORGIA

Scale 1:253,440

1 0 1 2 3 4 Miles

Fig. 4

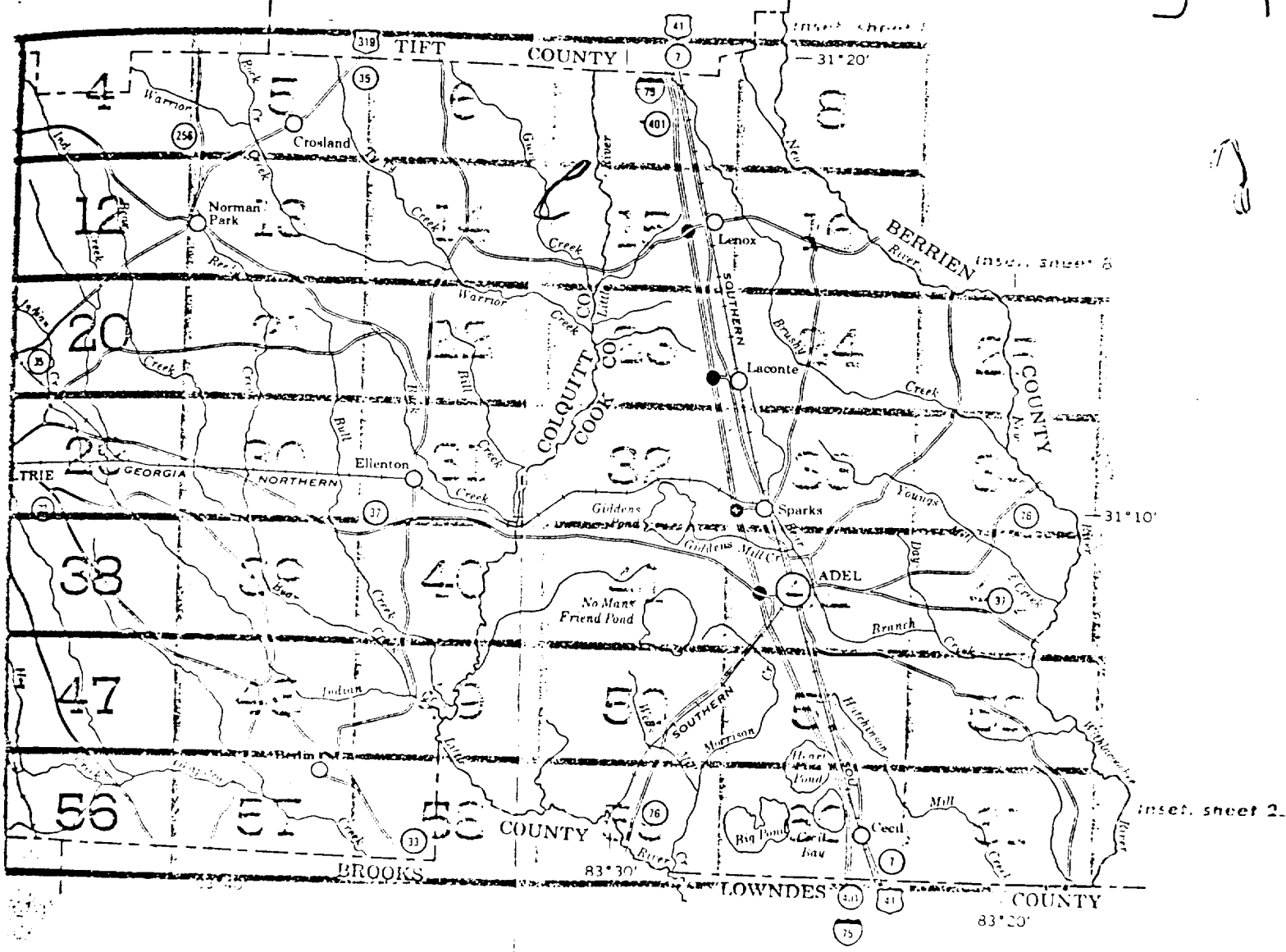


Table 3.1

Location: Adel, Cook County
Owner: Municipal
Well No.: City Well 4
Date drilled: June, 1957
Yield: 1,200 gpm

G.G.S. No.: --

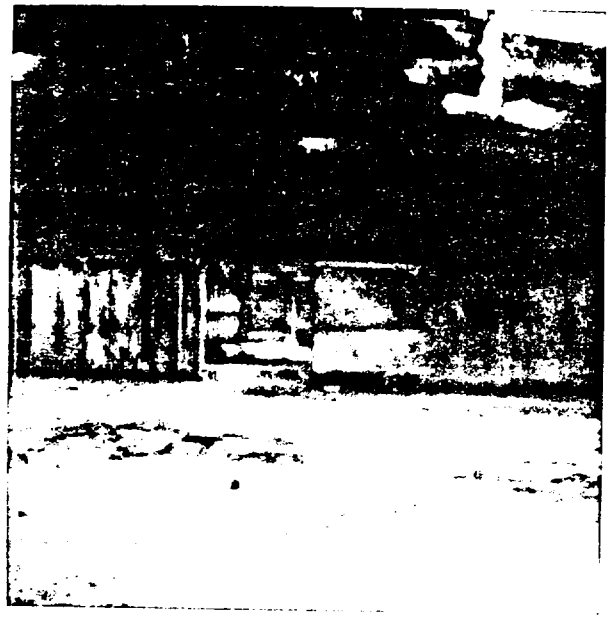
Color: ¢
Temperature (°F): 71
Date of collection: April 18, 1958

pH: 7.7
Specific conductance (micromhos 25°C): 399

| Constituents | Parts per million | Equivalents per million |
|---|---|---|
| Silica ($SiO_2$) | 33 | |
| Iron (Fe) | .26 | |
| Calcium (Ca) | 53 | 2.64 |
| Magnesium (Mg) | 16 | 1.32 |
| Sodium (Na) | 4.6 | .20 |
| Potassium (K) | 1.4 | .04 |
| Bicarbonate ($HCO_3$) | 144 | 2.36 |
| Carbonate ($CO_3$) | 0 | .00 |
| Sulfate ($SO_4$) | 87 | 1.81 |
| Chloride (Cl) | 4.0 | .11 |
| Fluoride (F) | .3 | .02 |
| Nitrate ($NO_3$) | .1 | .00 |
| Dissolved solids | 289 | |
| Hardness as $CaCO_3$ | | |
| Total . . . . . | . . 198 | |
| Noncarbonate . . . . . | . . 80 | |

| Casing record | | | | | Aquifer |
|---|---|---|---|---|---|
| Size (inches) | From (feet) | To (feet) | Depth of well (feet) | Screen setting (feet) | |
| 16 | 0 | 46 | | | |
| 12 | 46 | 276 | 500 | 276-500 a/ | Ocala limestone |

a/ Open hole in limestone



8AUG84 #1
LENOX

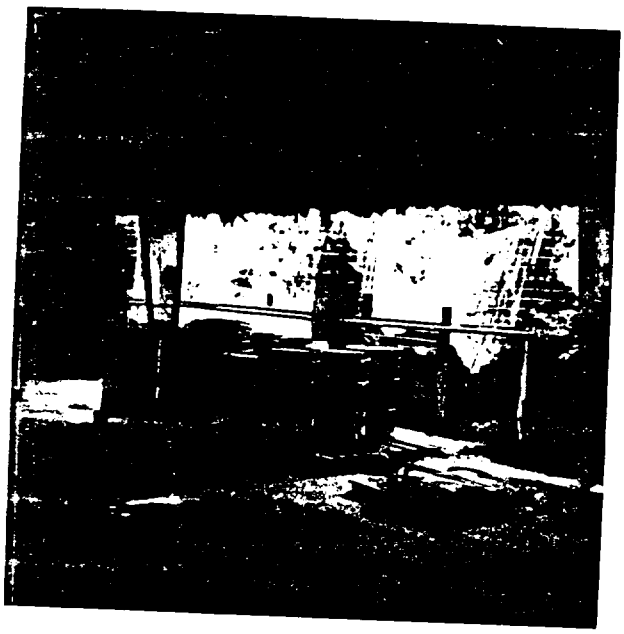
County Name COOK
Picture No 1 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing "E"
Photographer T WESTBROOK
Program 3012
Explanation: INSIDE VIEW OF WOOLFOLK CHEM. - LENOX WHSE

Other:

8 AUG84 #2
LENOX

County Name COOK
Picture No 2 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing "E"
Photographer T. WESTBROOK
Program 3012
Explanation: CLOSE-UP OF CRACK IN CONCRETE FOUNDATION

Other: 1981 FIRE CENTERED IN THIS AREA OF THE WAREHOUSE.



8AUG84 #3
LENOX

County Name COOK
Picture No 3 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing SE
Photographer T. WESTBROOK
Program 3012
Explanation: S.E. CORNER OF WHSE. EMPTY DRUMS (EXCESS) FROM CLEANUP.

Other:

8AUG84 #4
LENOX

County Name COOK
Picture No 4 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing —
Photographer T. WESTBROOK
Program 3012
Explanation: CLOSESUP OF SAMPLE LOCATIONS #3, #4.

Other: NOTE - PLASTIC LINER (FOLDED) UNDER SLAB

8AUG84 #5
LENOX

County Name COOK
Picture No 5 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing —
Photographer TWESTBROOK
Program 3012
Explanation: 2ND ATTEMPT OF OBTAINING SAME BUT CLEARER PHOTO AS # 4

Other:

County Name
Picture No of
Site Name
Date Weather
Direction Facing
Photographer
Program
Explanation:

Other:

#2



#4



#5




#1



#3

Woolfolk Chem Co
Lenox. 7-1-81
2051 hr
Picture shows building
+ Security Line around area
Larry Rogers
#3

POLACOLOR 2 K015251P

7-1-81 10.55
Woolfolk Chem Co Lenox
Front entrance.
taken by Larry Rogers
#1

7-1-81 11:00 Am.
Woolfolk Chem Co Lenox Ga
Right side of building + ditch
with runoff water
Larry Rogers
#4

POLACOLOR 2 K015251P

Woolfolk Chemical Co.
Lenox, Ga.
Back door of building
Water ran out here
during fire + carried
chemicals down into
ditch.
#2 Larry Rogers

Lenox, Ga
ditch with water taken with
chemicals.
Larry Rogers
#5

POLACOLOR 2 K015251P

Appendix B

# LAND PROTECTION BRANCH
# HAZARDOUS WASTE ANALYSIS REQUEST

DATE: 9AUG84 PROJECT: 3012 PROGRAM WOOLFOLK-LENOX W.HSE. COLLECTOR: T. WESTBROOK

NO. SAMPLES: 3 LOG NOS. 924-926 LIQUID ____ SOLID ____ SOIL 3

CAUSTIC ____ ACID ____ SOLVENT ____ UNKNOWN ____ SLUDGE ____

INFORMATION FOUND: File info: Fire in Agchem warehouse resulted in spillage & mixtures of various pesticides & herbicides with water. Soils outside w. hse. potentially contaminated.

HAZARDOUS WASTE NOS. Toxaphene – CAS 8001-35-2, Parathion - CAS 56-38-2, Chlordane 57-7

HAZARDOUS HANDLING: assume contaminated - odors were evident

WORK PRIORITY (CRITICAL NEED) NORMAL - ROUTINE - Moderate - LL Project

## METALS ANALYSES

| | TOT | DIS | | |
|---|---|---|---|---|
| METALS (DW NO Hg) | ☐ | ☐ | EP METALS (DW NO Hg) ☐ | 10CX ☐ 3CX ☐ |
| METALS (DW WITH Hg) | ☐ | ☐ | EP METALS (DW WITH Hg) | EP Toxaphene X |

| | TOT | DIS | | TOT | DIS | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NICKEL | ☐ | ☐ | CADMIUM | ☐ | ☐ | EP NICKEL | ☐ | EP CADMIUM | ☐ |
| ARSENIC | ☐ | ☐ | LEAD | ☐ | ☐ | EP ARSENIC | ☐ | EP LEAD | ☐ |
| CHROMIUM | ☐ | ☐ | MERCURY | ☐ | ☐ | EP CHROMIUM | ☐ | EP MERCURY | ☐ |
| CHROM-HEX | ☐ | ☐ | SELENIUM | ☐ | ☐ | EP CHROM-HEX | ☐ | EP SELENIUM | ☐ |
| ____ | ☐ | ☐ | ____ | ☐ | ☐ | ____ | ☐ | ____ | ☐ |

## SPECIFIC ANALYSES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| pH | ☐ | SULFIDE | ☐ | % SOLIDS | ☐ | ____ | ☐ |
| FLASH PT | ☐ | SP.COND. | ☐ | TOT. PHENOLS | ☐ | ____ | ☐ |
| CYANIDE TOT. | ☐ | TOC | ☐ | CHLORIDE | ☐ | ____ | ☐ |
| CYANIDE AM. | ☐ | TOH | ☐ | FLUORIDE | ☐ | ____ | ☐ |

RECEIVED SEP 19 1984 REMEDIAL ACTIONS UNIT

## ORGANIC ANALYSES

| | | | |
|---|---|---|---|
| PESTICIDE SCREEN (EC) | ☒ | GC-MS ACID EXTRACTABLES | ☐ |
| PCB | ☐ | GC-MS BASE/NEUTRALS | ☐ |
| VOLATILE ORGANICS (VOA) | ☐ | also suspect | |

SPECIFIC ORGANICS: ~~Toxaphene, Chlordane~~, Parathion & DDT

~~(in order of importance)~~

APPROVED: SFM 9/10 AUTHORIZED: ____



HW/0089F

GEORGIA ENVIRONMENTAL PROTECTION DIVISION

LABORATORY REPORT

SAMPLE DATE: 8AUG84 PROJECT: WOOLFOLK-LENOX W.HSE. COLLECTOR: T. WESTBROOK

DATE REC'D: 8/10/84
TIME REC'D: 1508
REC'D BY: D. Reed
DEL BY: T. WESTBROOK
Harold Langford
LABORATORY MANAGER
DATE:

| HW LOG NO. | 924 | 925 | 926 | | |
|---|---|---|---|---|---|
| LABEL | WOOLFOLK-LENOX #1 (BACKDOOR) | WOOLFOLK LENOX #2 (Front Door) | WOOLFOLK-LENOX #3 (Under slab) | | |
| PARAMETERS / LAB NO. | | | | | |
| Toxaphene mg/Kg dry | 984 | 6260 | 3080. | | |
| EP Toxaphene mg/l | <40 | <40 | <40 | | |

REMARKS:

GEORGIA ENVIRONMENTAL PROTECTION DIVISION
LAND PROTECTION BRANCH

CHAIN OF CUSTODY

FACILITY: WOOLFOLK-LENOX W. HSE. LOCATION: Lenox, Ga. Rt. 2 St.

| SAMPLE # | LOG # | LAB I.D. | DESCRIPTION | COLLECTED BY (Name) | DATE | TIME |
|---|---|---|---|---|---|---|
| #1 | | | WOOLFOLK-LENOX #1 SOILS (BACKDOOR) | T. WESTBROOK | 8AUG84 | 1:30 PM |
| #2 | | | WOOLFOLK-LENOX #2 SOILS (FRONT DOOR) | T. WESTBROOK | 8AUG84 | 1:50 PM |
| #3 | | | WOOLFOLK-LENOX #3 SOILS. (under slab) | T. WESTBROOK | 8AUG84 | 2:00 PM |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

TRANSFER RECORD

| TRANSFERRED BY (Name) | TO (Name) (IF FINAL: Lab Name) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (Name) | DATE |
|---|---|---|---|---|---|---|
| T. Westbrook | FINAL-EPD Lab | 10AUG84 | 1508 | Physical | Danny Reed | 8/10/84 |
| | | | | | | |
| | | | | | | |

ANALYSES REQUESTED: Pesticide Scan

25

APPENDIX C

REFERENCES


1. Soil Survey of Colquitt and Cook Counties, Georgia: U.S. Department of Agriculture, Soil Conservation Service, 1975.

2. Herrick, Stephen M. 1961, Well Logs of the Coastal Plain of Georgia: Georgia Geologic Survey Bulletin, 70.

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4. Stiles, H.R. and Matthews, S.E., 1983, Groundwater Data for Georgia, 1982: U.S. Geologic Survey Open-File Report 83-678.

5. Odom, Ron R., McCollum, Jerry L., Neville, Mary Anne and Ettman, David R., 1977, Georgia's Protected Wildlife: Georgia Department of Natural Resources.

6. McCollum, Jerry L., Ettman, David R., 1977, Georgia's Protected Plants: Georgia Department of Natural Resources.

7. Sax, N. Irving, 1979, Dangerous Properties of Industrial Materials: Van Nostrand Reinhold Company.

8. Hawley, Gessner G., 1981, The Condensed Chemical Dictionary: Van Nostrand Reinhold Company.

APPENDIX D

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 1 - SITE LOCATION AND INSPECTION INFORMATION**

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. SITE NAME AND LOCATION**

| 01 SITE NAME (Legal, common, or descriptive name of site) | 02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER |
|---|---|
| Woolfolk Chemical - Lenox Warehouse | Rentz Avenue and East Colquitt |

| 03 CITY | 04 STATE | 05 ZIP CODE | 06 COUNTY | 07 COUNTY CODE | 08 CONG DIST |
|---|---|---|---|---|---|
| Lenox | GA | 31637 | Cook | 075 | 2 |

| 09 COORDINATES LATITUDE | LONGITUDE | 10 TYPE OF OWNERSHIP (Check one) |
|---|---|---|
| 31° 16' 17.0" | 083° 27' 45.0" | ☒ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN |

**III. INSPECTION INFORMATION**

| 01 DATE OF INSPECTION | 02 SITE STATUS | 03 YEARS OF OPERATION |
|---|---|---|
| 8 8 84 (MONTH DAY YEAR) | ☐ ACTIVE ☒ INACTIVE | 1976 (BEGINNING YEAR) 1981 (ENDING YEAR) ___ UNKNOWN |

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☒ E. STATE ☐ F. STATE CONTRACTOR GA EPD (Name of firm) ☐ G. OTHER _____ (Specify)

| 05 CHIEF INSPECTOR | 06 TITLE | 07 ORGANIZATION | 08 TELEPHONE NO. |
|---|---|---|---|
| Thomas M. Westbrook | Environmental Specialist | GA EPD | (404) 656-7404 |

| 09 OTHER INSPECTORS | 10 TITLE | 11 ORGANIZATION | 12 TELEPHONE NO. |
|---|---|---|---|
| Jeffrey M. Williams | Environmental Specialist | GA EPD | (404) 656-7404 |
| | | | ( ) |
| | | | ( ) |
| | | | ( ) |
| | | | ( ) |

| 13 SITE REPRESENTATIVES INTERVIEWED | 14 TITLE | 15 ADDRESS | 16 TELEPHONE NO |
|---|---|---|---|
| Bobby Lindsey | Owner | 103 Magnolia Drive | (912) 386-4300 |
| | | P. O. Box 1809 | ( ) |
| | | Tifton, GA 31794 | ( ) |
| | | | ( ) |
| | | | ( ) |
| | | | ( ) |
| | | | |

| 17 ACCESS GAINED BY (Check one) | 18 TIME OF INSPECTION | 19 WEATHER CONDITIONS |
|---|---|---|
| ☒ PERMISSION ☐ WARRANT | 12:00 p.m. | Clear/sunny |

**IV. INFORMATION AVAILABLE FROM**

| 01 CONTACT | 02 OF (Agency/Organization) | 03 TELEPHONE NO. |
|---|---|---|
| Mr. Bobby Lindsey | Owner | (912) 386-4300 |

| 04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM | 05 AGENCY | 06 ORGANIZATION | 07 TELEPHONE NO. | 08 DATE |
|---|---|---|---|---|
| Jeffrey M. Williams | GA DNR | EPD RAU | 656-7404 | / / (MONTH DAY YEAR) |

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
## PART 2 - WASTE INFORMATION

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS**

01 PHYSICAL STATES (Check all that apply)

- [X] A. SOLID
- [X] B. POWDER FINES
- [ ] C. SLUDGE
- [ ] D. OTHER _____ (Specify)
- [ ] E. SLURRY
- [ ] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS Unknown
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [X] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

**III. WASTE TYPE**

| CATEGORY | SUBSTANCE NAME | 01 GROSS AMOUNT | 02 UNIT OF MEASURE | 03 COMMENTS |
|---|---|---|---|---|
| SLU | SLUDGE | | | |
| OLW | OILY WASTE | | | |
| SOL | SOLVENTS | | | |
| PSD | PESTICIDES | Unknown | Unknown | Waste is toxaphene contaminated |
| OCC | OTHER ORGANIC CHEMICALS | | | soil. Amount is unknown because |
| IOC | INORGANIC CHEMICALS | | | extent of contamination is |
| ACD | ACIDS | | | unknown |
| BAS | BASES | | | |
| MES | HEAVY METALS | | | |

**IV. HAZARDOUS SUBSTANCES** (See Appendix for most frequently cited CAS Numbers)

| 01 CATEGORY | 02 SUBSTANCE NAME | 03 CAS NUMBER | 04 STORAGE/DISPOSAL METHOD | 05 CONCENTRATION | 06 MEASURE OF CONCENTRATION |
|---|---|---|---|---|---|
| PSD | Toxaphene | 8001-35-2 | OD (open dump) | 2.88 | ppm (soil) |

**V. FEEDSTOCKS** (See Appendix for CAS Numbers)

| CATEGORY | 01 FEEDSTOCK NAME | 02 CAS NUMBER | CATEGORY | 01 FEEDSTOCK NAME | 02 CAS NUMBER |
|---|---|---|---|---|---|
| FDS | | | FDS | | |
| FDS | | | FDS | | |
| FDS | | | FDS | | |
| FDS | | | FDS | | |

**VI. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

GA EPD Files and Emergency Response Files
Sample analyses from EPD lab and Cooperative Extension Service Lab in Athens, GA
Cleanup information in the State Files from O. H. Materials File.

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. HAZARDOUS CONDITIONS AND INCIDENTS**

01 ☐ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 X B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) X POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential contamination of Brushy Creek surface waters by runoff from two city drainage ditches that are adjacent to the warehouse building.

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 X F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: ½ (Acres)
02 X OBSERVED (DATE: 8/8/84) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Soils adjaacent to former warehouse and the surrounding lot are known to have received fire fighting waters containing large concentrations of toxaphene. Further sampling needed to define extent of contamination.

01 ☐ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 X I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: 25 - 50
02 ☐ OBSERVED (DATE: _____) X POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Warehouse lot is open and is in a residential/urban setting, pedestrain traffic is not controlled. Residences are present on 3 adjacent sides of the warehouse lot.

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS**

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. HAZARDOUS CONDITIONS AND INCIDENTS** *(Continued)*

01 [X] J. DAMAGE TO FLORA — 02 [X] OBSERVED (DATE: 8/8/84) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

Several areas that apparently received water runoff from the fire in 1981 did not appear to be able to support plant growth in 1984. (Trip Report - T. Westbrook 8/8/84)

01 [ ] K. DAMAGE TO FAUNA — 02 [ ] OBSERVED (DATE: ) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION *(Include name(s) of species)*

01 [ ] L. CONTAMINATION OF FOOD CHAIN — 02 [ ] OBSERVED (DATE: ) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] M. UNSTABLE CONTAINMENT OF WASTES *(Spills, Runoff, Standing liquids, Leaking drums)* — 02 [ ] OBSERVED (DATE: ) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: — 04 NARRATIVE DESCRIPTION

01 [X] N. DAMAGE TO OFFSITE PROPERTY — 02 [X] OBSERVED (DATE: 7/1/81) — [X] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

Samples of waters in ditches adjacent to site as a result of fire fighting activities were observed to contain from 10 to 263 ppm (mg/L) of toxaphene. Length of ditch is approximately 0.3 miles.

01 [ ] O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 [ ] OBSERVED (DATE: ) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] P. ILLEGAL/UNAUTHORIZED DUMPING — 02 [ ] OBSERVED (DATE: ) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

Inside the warehouse, plywood and various wood beams remain and appear to have residual contamination. Remnant insulation on ceilings and walls was observed and may contain contaminants.

**III. TOTAL POPULATION POTENTIALLY AFFECTED:** 25-50

**IV. COMMENTS**

As a result of a complaint from the warehouse owner in June 1984, this site has been discovered to ERRIS. Efforts are under way to effect an assessment and remedial action plan.

**V. SOURCES OF INFORMATION** *(Cite specific references, e.g., State files, sample analysis, reports)*

GA State File information
GA EPD Lab analyses of ditch water samples.
Independent lab work on samples taken during cleanup conducted by O.H. Materials.
GA EPD lab analyses of 8/8/84 soil samples.

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION
### PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. PERMIT INFORMATION**

| 01 TYPE OF PERMIT ISSUED (Check all that apply) | 02 PERMIT NUMBER | 03 DATE ISSUED | 04 EXPIRATION DATE | 05 COMMENTS |
|---|---|---|---|---|
| ☐ A. NPDES | | | | |
| ☐ B. UIC | | | | |
| ☐ C. AIR | | | | |
| ☐ D. RCRA | | | | |
| ☐ E. RCRA INTERIM STATUS | | | | |
| ☐ F. SPCC PLAN | | | | |
| ☐ G. STATE (Specify) | | | | |
| ☐ H. LOCAL (Specify) | | | | |
| ☐ I. OTHER (Specify) | | | | |
| X J. NONE | | | | Permit not required |

**III. SITE DESCRIPTION**

| 01 STORAGE/DISPOSAL (Check all that apply) | 02 AMOUNT | 03 UNIT OF MEASURE |
|---|---|---|
| ☐ A. SURFACE IMPOUNDMENT | | |
| ☐ B. PILES | | |
| ☐ C. DRUMS, ABOVE GROUND | | |
| ☐ D. TANK, ABOVE GROUND | | |
| ☐ E. TANK, BELOW GROUND | | |
| ☐ F. LANDFILL | | |
| ☐ G. LANDFARM | | |
| X H. OPEN DUMP | Unknown | |
| ☐ I. OTHER (Specify) | | |

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER

- X A. BUILDINGS ON SITE

100' x 60'

06 AREA OF SITE

1½ (Acres)

07 COMMENTS

Site is located in a poorly drained area that is located within a residential urban setting. Soils at the site are known to contain unknown quantities of toxaphene. Fire fighting waters were treated as a result of a 1981 fire, but soils were not treated.

**IV. CONTAINMENT**

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☒ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Contamination of soils appear to be contained to the site boundaries. EP toxicity tests show no potential for the contaminant, toxaphene to leach into the soils. Site is bordered by two drainage ditches that may contain contaminated soils.

**V. ACCESSIBILITY**

01 WASTE EASILY ACCESSIBLE X YES ☐ NO

02 COMMENTS

Warehouse lot is open in a residential setting. Residences are present on 3 adjacent sides of the warehouse lot.

**VI. SOURCES OF INFORMATION** (Cite specific references, e.g. state files, sample analysis, reports)

GA EPD State Files
EPD Site Inspection 8/8/84 - Thomas M. Westbrook

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. DRINKING WATER SUPPLY**

01 TYPE OF DRINKING SUPPLY (Check as applicable)

| | SURFACE | WELL |
|---|---|---|
| COMMUNITY | A. ☐ | B. ☒ |
| NON-COMMUNITY | C. ☐ | D. ☐ |

02 STATUS

| ENDANGERED | AFFECTED | MONITORED |
|---|---|---|
| A. ☐ | B. ☐ | C. ☐ |
| D. ☐ | E. ☐ | F. ☐ |

03 DISTANCE TO SITE

A. ¼ (mi)
B. ¼ (mi)

**III. GROUNDWATER**

01 GROUNDWATER USE IN VICINITY (Check one)

☒ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 960

03 DISTANCE TO NEAREST DRINKING WATER WELL ¼ (mi)

| 04 DEPTH TO GROUNDWATER | 05 DIRECTION OF GROUNDWATER FLOW | 06 DEPTH TO AQUIFER OF CONCERN | 07 POTENTIAL YIELD OF AQUIFER | 08 SOLE SOURCE AQUIFER |
|---|---|---|---|---|
| Unknown (ft) | SSE | 300-400 (ft) | 360,000 (gpd) | ☒ YES ☐ NO |

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

There are two municipal wells located within the city of Lenox, GA. Both wells are 8 inch wells that are approximately 350 feet deep. Well #1 is located at the corner of Gray St. and Haze Rd. Well #2 is located on Broad Street at the water storage tank.

10 RECHARGE AREA

☒ YES ☐ NO

COMMENTS Recharge area for shallow aquifer and to a lesser extent for the Principal Artesian Aquifer.

11 DISCHARGE AREA

☒ YES ☐ NO

COMMENTS Shallow aquifer discharges into the New River.

**IV. SURFACE WATER**

01 SURFACE WATER USE (Check one)

☐ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

| NAME: | AFFECTED | DISTANCE TO SITE |
|---|---|---|
| Brushy Creek | ☐ | ½ (mi) |
| | ☐ | (mi) |
| | ☐ | (mi) |

**V. DEMOGRAPHIC AND PROPERTY INFORMATION**

01 TOTAL POPULATION WITHIN

| ONE (1) MILE OF SITE | TWO (2) MILES OF SITE | THREE (3) MILES OF SITE |
|---|---|---|
| A. 966 NO. OF PERSONS | B. NO. OF PERSONS | C. NO. OF PERSONS |

02 DISTANCE TO NEAREST POPULATION 0.1 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE 330

04 DISTANCE TO NEAREST OFF-SITE BUILDING 0.1 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

Site is located in a residential urban setting with 3 residences located on 3 adjacent sides of the warehouse lot. Site is located in downtown area of city of Lenox within a densely populated area.

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

## VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE *(Check one)*

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN $10^{-3}$ cm/sec

02 PERMEABILITY OF BEDROCK *(Check one)*

☐ A. IMPERMEABLE *(Less than $10^{-9}$ cm/sec)* ☐ B. RELATIVELY IMPERMEABLE *($10^{-4} - 10^{-6}$ cm/sec)* ☒ C. RELATIVELY PERMEABLE *($10^{-2} - 10^{-4}$ cm/sec)* ☐ D. VERY PERMEABLE *(Greater than $10^{-2}$ cm/sec)*

| 03 DEPTH TO BEDROCK | 04 DEPTH OF CONTAMINATED SOIL ZONE | 05 SOIL pH |
|---|---|---|
| 200 (ft) | 1-2 (ft) | 4.5-5.5 |

| 06 NET PRECIPITATION | 07 ONE YEAR 24 HOUR RAINFALL | 08 SLOPE | | |
|---|---|---|---|---|
| | | SITE SLOPE | DIRECTION OF SITE SLOPE | TERRAIN AVERAGE SLOPE |
| (in) | (in) | 0-3 % | SSW | 0-3 % |

09 FLOOD POTENTIAL

SITE IS IN _____ YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS *(5 acre minimum)*

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT *(of endangered species)*

_____ (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

| COMMERCIAL/INDUSTRIAL | RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES | AGRICULTURAL LANDS PRIME AG LAND | AGRICULTURAL LANDS AG LAND |
|---|---|---|---|
| A. 0.2 (mi) | B. 0.1 (mi) | C. 1-2 (mi) | D. 0.4 (mi) |

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site is on relatively flat land (300' elevation) approximately ½ to 1 mile from the surface waters of Brushy Creek. Elevations of 240 feet are found about 4 miles east of the site along the New River. Land south of the site is typically laden with ponds and large depressions. Site is located on a topographic high with respect to the immediate and surrounding topography.

## VII. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

Lenox, Georgia 7.5 Minute Topographic map,
USDA-USFS Soil Survey Map of Cook County
Department of Commerce and Flood Insurance Map for Cook County compiled by US Department of Housing and Urban Development.

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 6 - SAMPLE AND FIELD INFORMATION

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. SAMPLES TAKEN**

| SAMPLE TYPE | 01 NUMBER OF SAMPLES TAKEN | 02 SAMPLES SENT TO | 03 ESTIMATED DATE RESULTS AVAILABLE |
|---|---|---|---|
| GROUNDWATER | | | |
| SURFACE WATER | | | |
| WASTE | | | |
| AIR | | | |
| RUNOFF | | | |
| SPILL | | | |
| SOIL | Three | GA EPD lab | attached |
| VEGETATION | | | |
| OTHER | | | |

**III. FIELD MEASUREMENTS TAKEN**

| 01 TYPE | 02 COMMENTS |
|---|---|
| | |
| | |
| | |
| | |
| | |

**IV. PHOTOGRAPHS AND MAPS**

01 TYPE ☐ GROUND ☐ AERIAL

02 IN CUSTODY OF _____ (Name of organization or individual)

03 MAPS X YES ☐ NO

04 LOCATION OF MAPS Sketch map in report (Figure 2)

**V. OTHER FIELD DATA COLLECTED** (Provide narrative description)

**VI. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

Trip Report - 8/8/84 - Thomas M. Westbrook - GA EPD

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 7 - OWNER INFORMATION

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

| II. CURRENT OWNER(S) | | | PARENT COMPANY (If applicable) | | |
|---|---|---|---|---|---|
| 01 NAME: Mr. Bobby Lindsey | | 02 D+B NUMBER | 08 NAME | | 09 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.): 103 Magnolia Drive,PO Box 1809 | | 04 SIC CODE | 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 11 SIC CODE |
| 05 CITY: Tifton | 06 STATE: GA | 07 ZIP CODE: 31794 | 12 CITY | 13 STATE | 14 ZIP CODE |
| 01 NAME | | 02 D+B NUMBER | 08 NAME | | 09 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 11 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 12 CITY | 13 STATE | 14 ZIP CODE |
| 01 NAME | | 02 D+B NUMBER | 08 NAME | | 09 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 11 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 12 CITY | 13 STATE | 14 ZIP CODE |
| 01 NAME | | 02 D+B NUMBER | 08 NAME | | 09 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 11 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 12 CITY | 13 STATE | 14 ZIP CODE |

| III. PREVIOUS OWNER(S) (List most recent first) | | | IV. REALTY OWNER(S) (If applicable; list most recent first) | | |
|---|---|---|---|---|---|
| 01 NAME | | 02 D+B NUMBER | 01 NAME | | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 05 CITY | 06 STATE | 07 ZIP CODE |
| 01 NAME | | 02 D+B NUMBER | 01 NAME | | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 05 CITY | 06 STATE | 07 ZIP CODE |
| 01 NAME | | 02 D+B NUMBER | 01 NAME | | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 05 CITY | 06 STATE | 07 ZIP CODE |

**V. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

Telephone memo - to Mr. Bobby Lindsey
EPA Form 2070-12 Preliminary Assessment

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 8 - OPERATOR INFORMATION

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

| II. CURRENT OPERATOR (Provide if different from owner) | | | OPERATOR'S PARENT COMPANY (If applicable) | | |
|---|---|---|---|---|---|
| 01 NAME | | 02 D+B NUMBER | 10 NAME | | 11 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 12 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 13 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 14 CITY | 15 STATE | 16 ZIP CODE |
| 08 YEARS OF OPERATION | 09 NAME OF OWNER | | | | |

| III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner) | | | PREVIOUS OPERATORS' PARENT COMPANIES (If applicable) | | |
|---|---|---|---|---|---|
| 01 NAME | | 02 D+B NUMBER | 10 NAME | | 11 D+B NUMBER |
| Woolfolk Chemical Works | | | | | |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 12 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 13 SIC CODE |
| P. O. Box 938 | | | | | |
| 05 CITY | 06 STATE | 07 ZIP CODE | 14 CITY | 15 STATE | 16 ZIP CODE |
| Fort Valley | GA | 31031 | | | |
| 08 YEARS OF OPERATION | 09 NAME OF OWNER DURING THIS PERIOD | | | | |
| 1976-1981 | Mr. Bobby Lindsey | | | | |
| 01 NAME | | 02 D+B NUMBER | 10 NAME | | 11 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 12 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 13 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 14 CITY | 15 STATE | 16 ZIP CODE |
| 08 YEARS OF OPERATION | 09 NAME OF OWNER DURING THIS PERIOD | | | | |
| 01 NAME | | 02 D+B NUMBER | 10 NAME | | 11 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 12 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 13 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 14 CITY | 15 STATE | 16 ZIP CODE |
| 08 YEARS OF OPERATION | 09 NAME OF OWNER DURING THIS PERIOD | | | | |

**IV. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

State Files - GA EPD - Woolfolk Chemical Lenox Warehouse
Mr. Bobby Lindsey

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 9 - GENERATOR/TRANSPORTER INFORMATION

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

## II. ON-SITE GENERATOR

| 01 NAME | 02 D+B NUMBER | |
|---|---|---|
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | |
| 05 CITY | 06 STATE | 07 ZIP CODE |

## III. OFF-SITE GENERATOR(S)

| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
|---|---|---|---|
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY / 06 STATE | 07 ZIP CODE | 05 CITY / 06 STATE | 07 ZIP CODE |
| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY / 06 STATE | 07 ZIP CODE | 05 CITY / 06 STATE | 07 ZIP CODE |

## IV. TRANSPORTER(S)

| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
|---|---|---|---|
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY / 06 STATE | 07 ZIP CODE | 05 CITY / 06 STATE | 07 ZIP CODE |
| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY / 06 STATE | 07 ZIP CODE | 05 CITY / 06 STATE | 07 ZIP CODE |

## V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 10 - PAST RESPONSE ACTIVITIES**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. PAST RESPONSE ACTIVITIES**

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ D. SPILLED MATERIAL REMOVED — 02 DATE 7/11/81 — 03 AGENCY O. H. Materials Co.
04 DESCRIPTION
Approximately 200 $yd^3$ material shipped to Emelle, Alabama as a result of the 7/81 warehouse fire.

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ O. EMERGENCY DIKING SURFACE WATER DIVERSION — 02 DATE 7/1/81 — 03 AGENCY City of Lenox
04 DESCRIPTION Construction of earth dams was undertaken to stop the pesticide contaminated waters from draining off-site.

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 10 - PAST RESPONSE ACTIVITIES**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832814 |

**II PAST RESPONSE ACTIVITIES** *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ X. FIRE CONTROL — 02 DATE 7/1/81 — 03 AGENCY City of Lenox
04 DESCRIPTION A chemical fire on 7/1/81 at the Lenox Warehouse in which several gallons of fire fighting waters carried chemicals into a nearby drainage ditch.

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

**III. SOURCES OF INFORMATION** *(Cite specific references, e.g., state files, sample analysis, reports)*

GA EPD State Files

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 11 - ENFORCEMENT INFORMATION**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. ENFORCEMENT INFORMATION**

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES X NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

No Regulatory Enforcement Action has taken place to date. GA EPD Emergency Response Team Member Edward Cook responded to a 7/1/81 chemical fire at the subject site and supervised the warehouse clean-up.

**III. SOURCES OF INFORMATION** *(Cite specific references, e.g., state files, sample analysis, reports)*

GA EPD State Files - Emergency Response Team Files

EPA FORM 2070-13 (7-81)

WESTON • SPER
Suite C, 4329 Memorial Drive
Decatur, GA 30032 • (404) 294-9110

TECHNICAL ASSISTANCE TEAM FOR EMERGENCY RESPONSE REMOVAL AND PREVENTION
EPA CONTRACT 68-01-6669

MEMORANDUM

TO: Ron Dobbs
EPA Region IV - Atlanta

THRU: John G. Cwiek
TATL Region IV - Atlanta

FROM: Susan Coker
TAT Region IV - Atlanta

SUBJECT: Woolfolk Chemcial Site Air Monitoring, Lenox, GA.
TDD# 04-8504-03

DATE: April 9, 1985
TAT-04-F-00347

On Thursday, April 4, 1985, TAT member Coker was requested by OSC Dobbs to assist in investigating a warehouse in Lenox, GA. The warehouse had been used to store agricultural chemicals/pesticides until a fire occurred in 1981. In the process of extinquishing the fire, quantities of chemicals mixed with water, among these Chlordane and Toxaphene, were released into drainage ditches and soil surrounding the warehouse. In 1981 OH Materials cleanup crews contracted by Woolfolk Chemicals removed remaining chemicals in the building and washed floors and walls with water under high pressure. In March of 1985, Bob Linsey of Lenox, GA, owner of the building, reported to EPA Region IV that a strong odor still existed in the building and requested EPA personnel to investigate the warehouse.

Friday, April 5, 1985

1015 OSC R. Dobbs and TAT member S. Coker arrived at the Woolfolk Chemical warehouse, met with Bob Linsey and discussed the events of the 1981 fire.

1145 R. Dobbs and S. Coker entered the warehouse wearing Level C protection. B. Linsey accompanied without protective gear. Linsey identified the "hot spots" (see map) where chemicals had been located and cracks in the cement where pesticide residue had accumulated. Linsey noted the State Environmental Protection Division had taken a sample here and two others outside of the building. A large hole in the roof above the "hot spots" and residue on the walls and ceiling were also observed.

In the second room (see map) unused overpack drums, left over from the fire, and turpentine barrels were observed. R. Dobbs photographed the warehouse.

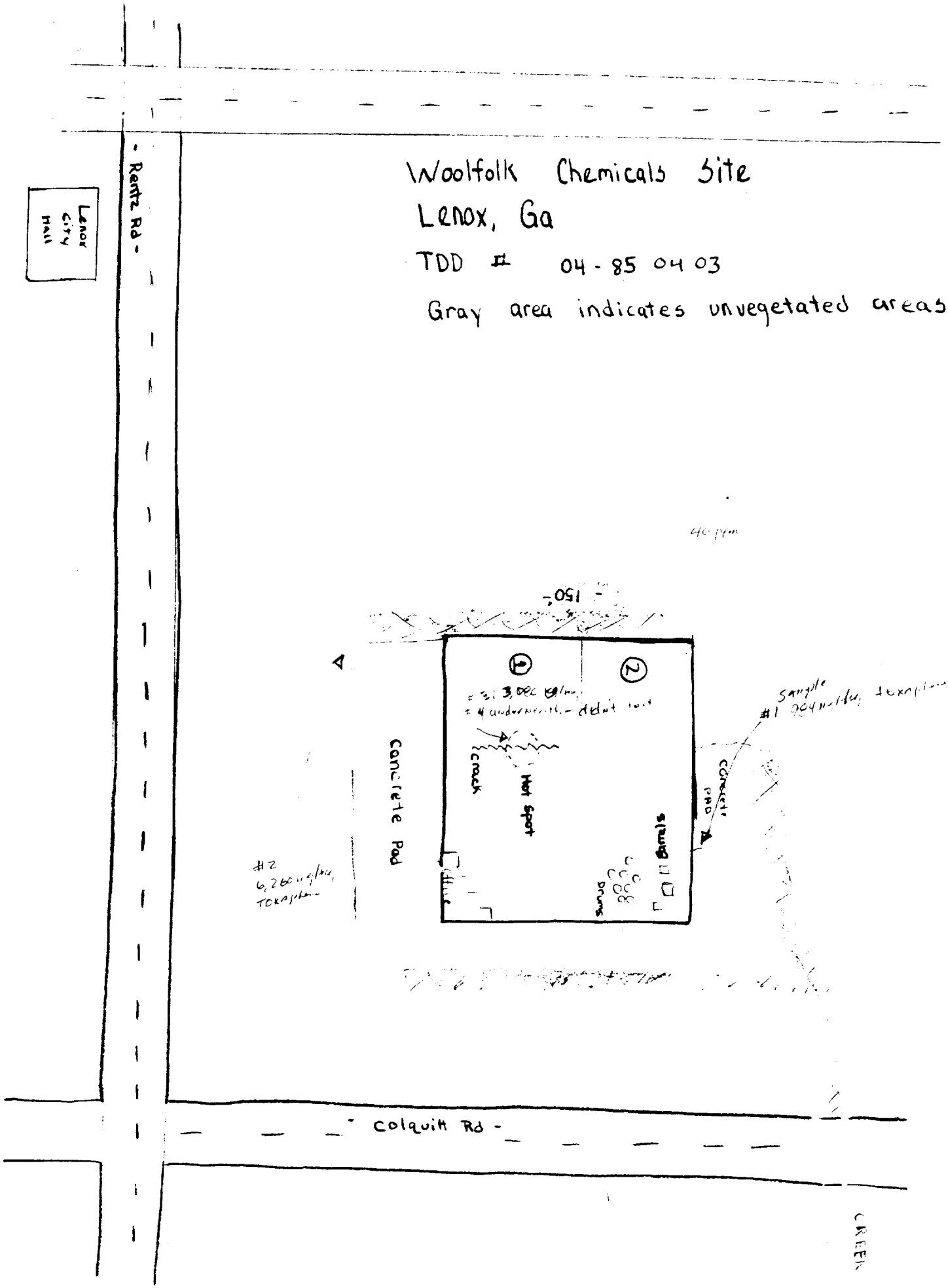
1215 Linsey, Dobbs and Coker exited the warehouse and surveyed the area outside the warehouse. No vegetation grew in areas which received water from the fire (see map). Dobbs photographed the contaminated areas.

Linsey informed Coker the city's water supply was from a deep well (> 300 feet) and that any shallow wells in the area were used for livestock and irrigation. Linsey also noted a problem existed with children playing in the building. Coker suggested if limiting access to the building could not be achieved, it would be a good idea to post "do not enter" and warning signs.

Dobbs and Linsey discussed the future of the site. Linsey indicated Woolfolk Chemical would not accept any responsibility for further cleanup of the warehouse and also expressed concern over selling the building in its present condition. Dobbs assured Linsey he would relay further developments concerning the building.

1315 Dobbs and Coker depart for Atlanta.

Woolfolk Chemicals Site
Lenox, Ga
TDD # 04-85 04 03
Gray area indicates unvegetated areas



Received 9/19/84
entered in CERCLIS 9/19/84
CBN

needs S.I.
surface soils
should be
ranked

# ARDOUS WASTE SITE
# RY ASSESSMENT
# MATION AND ASSESSMENT

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. SITE**

| 01 SITE N | 02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER | | | | |
|---|---|---|---|---|---|
| V | Rentz Ave. and East Colquitt | | | | |
| 03 CITY | 04 STATE | 05 ZIP CODE | 06 COUNTY | 07 COUNTY CODE | 08 CONG DIST |
| I | GA | 31637 | Cook | 075 | 2 |
| 09 COORD | | | | | |
| 3 | | | | | |

10 DIRECT

ection of I-75 and Central Ave. (Lenox exit
#
lroad tracks (Southern & Fla.) to intersection
W... Rentz. Turn right (south) onto Rentz and proceed one block to warehouse(onleft).

**III. RESPONSIBLE PARTIES**

| 01 OWNER (If known) | 02 STREET (Business, mailing, residential) | | | |
|---|---|---|---|---|
| Mr. Bobby Lindsey | 103 Magnolia Drive P.O. Box 1809 | | | |
| 03 CITY | 04 STATE | 05 ZIP CODE | 06 TELEPHONE NUMBER | |
| Tifton | GA | 31794 | (912) 386-4300 | |
| 07 OPERATOR (If known and different from owner) | 08 STREET (Business, mailing, residential) | | | |
| (Former) Woolfolk Chemical Works | P.O. Box 938 | | | |
| 09 CITY | 10 STATE | 11 ZIP CODE | 12 TELEPHONE NUMBER | |
| Fort Valley | GA | 31030 | ( ) | |

13 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: / / (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR) ☒ C. NONE

**IV. CHARACTERIZATION OF POTENTIAL HAZARD**

01 ON SITE INSPECTION
☒ YES DATE 8/8/84 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
Late 1970's (BEGINNING YEAR) 1981 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED Warehouse for extensive herbicide and pesticide (agricultural) product lines. Suspected compounds of regulatory importance Toxaphene. Parathion. Chlordane and DDE.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION Soils adjacent to warehouse and two ditches received large quantities of fire-fighting waters. These waters were tested and contained excessive amounts of Toxaphene. The waters were treated, however, ditch soils and soils around building remain.

**V. PRIORITY ASSESSMENT**

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

**VI. INFORMATION AVAILABLE FROM**

| 01 CONTACT | 02 OF (Agency/Organization) | | | 03 TELEPHONE NUMBER |
|---|---|---|---|---|
| Mr. Bobby Lindsey | Owner | | | (912) 386-4300 |
| 04 PERSON RESPONSIBLE FOR ASSESSMENT | 05 AGENCY | 06 ORGANIZATION | 07 TELEPHONE NUMBER | 08 DATE |
| Thomas Westbrook TMW | GA DNR | R.A.U. | (404) 656-7404 | 8/28/84 (MONTH DAY YEAR) |

EPA FORM 2070-12 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## PRELIMINARY ASSESSMENT
## PART 2 - WASTE INFORMATION

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

## II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

**01 PHYSICAL STATES** *(Check all that apply)*

- [x] A. SOLID
- [x] B. POWDER, FINES
- [ ] C. SLUDGE
- [ ] D. OTHER _____ *(Specify)*
- [ ] E. SLURRY
- [ ] F. LIQUID
- [ ] G. GAS

**02 WASTE QUANTITY AT SITE** *(Measures of waste quantities must be independent)*

TONS _____

CUBIC YARDS 200

NO. OF DRUMS _____

**03 WASTE CHARACTERISTICS** *(Check all that apply)*

- [x] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [x] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

## III. WASTE TYPE

| CATEGORY | SUBSTANCE NAME | 01 GROSS AMOUNT | 02 UNIT OF MEASURE | 03 COMMENTS |
|---|---|---|---|---|
| SLU | SLUDGE | | | |
| OLW | OILY WASTE | | | |
| SOL | SOLVENTS | | | |
| PSD | PESTICIDES | 200 | CY | Contaminated Soils |
| OCC | OTHER ORGANIC CHEMICALS | | | |
| IOC | INORGANIC CHEMICALS | | | |
| ACD | ACIDS | | | |
| BAS | BASES | | | |
| MES | HEAVY METALS | | | |

## IV. HAZARDOUS SUBSTANCES *(See Appendix for most frequently cited CAS Numbers)*

| 01 CATEGORY | 02 SUBSTANCE NAME | 03 CAS NUMBER | 04 STORAGE/DISPOSAL METHOD | 05 CONCENTRATION | 06 MEASURE OF CONCENTRATION |
|---|---|---|---|---|---|
| PSD | Toxaphene | 8001-35-2 | OD (open dump) | 2.88 | PPM (soil |

## V. FEEDSTOCKS *(See Appendix for CAS Numbers)*

| CATEGORY | 01 FEEDSTOCK NAME | 02 CAS NUMBER | CATEGORY | 01 FEEDSTOCK NAME | 02 CAS NUMBER |
|---|---|---|---|---|---|
| FDS | | | FDS | | |
| FDS | | | FDS | | |
| FDS | | | FDS | | |
| FDS | | | FDS | | |

## VI. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

Georgia EPD files and Emergency Response Files. Sample analyses from EPD lab and Cooperative Extension Service Lab in Athens, GA. Cleanup information in State Files from O.H. Materials Files.

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## PRELIMINARY ASSESSMENT
### PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. HAZARDOUS CONDITIONS AND INCIDENTS**

01 ☐ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: ½ (Acres)
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Soils adjacent to former warehouse and the surrounding lot are known to have received fire fighting waters containing large concentrations of Toxaphene.

01 ☐ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: 25-50
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Warehouse lot is open and in a residential/urban setting. Pedestrian traffic is not controlled. Residences were observed on 3 adjacent sides of the warehouse lot.

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**PRELIMINARY ASSESSMENT**
**PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS**

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. HAZARDOUS CONDITIONS AND INCIDENTS** *(Continued)*

01 ☒ J. DAMAGE TO FLORA — 02 ☒ OBSERVED (DATE: 080884) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Several areas that apparently received water runoff from fire in 1981 did not appear to be able to support plant growth in 1984.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION *(Include name(s) of species)*

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES *(Spills/runoff, standing liquids/leaking drums)* — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 ☒ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Waters from fire were contained in openditch. The waters were removed and treated. Soils have not been tested.

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☒ OBSERVED (DATE: 1981) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Samples of waters in ditches adjacent to site as a result of fire fighting activities were observed to contain from 10 to 263 ppm (mg/l) of Toxaphene. Length of ditch is approximately 0.3 miles.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS
Inside the warehouse plywood and various wood beams remain and appear to have residual contamination. Remnant insulation on ceilings and walls were observed and may contain contaminants.

**III. TOTAL POPULATION POTENTIALLY AFFECTED:** 25 to 50

**IV. COMMENTS**

As a result of a complaint from the warehouse owner in June 1984. This site has been discovered to ERRIS in order to affect a final deterimination as to final disposition.

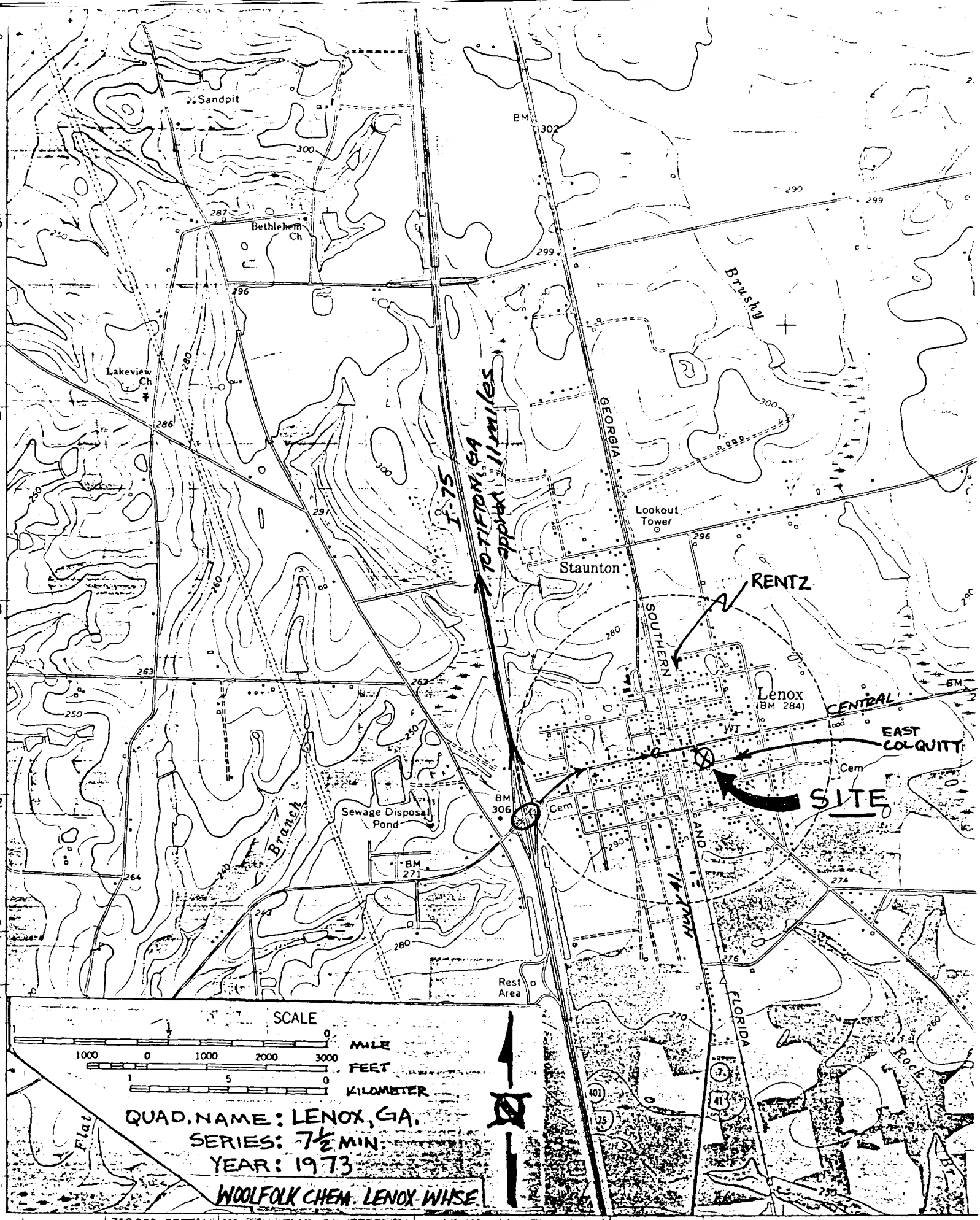
**V. SOURCES OF INFORMATION** *(Cite specific references, e.g., state files, sample analysis, reports)*

GA State File information. GA EPD lab analyses of ditch water samples. Independent lab work on samples taken during cleanup conducted by O.H. Materials.

JUSTIFICATION FOR INSPECTION PRIORITY OF MEDIUM
FOR THE WOOLFOLK CHEMICALS, INC. LENOX WAREHOUSE

As a result of inquiries and requests by the owner of this warehouse and because of the potential environmental impact associated, a site visit to the warehouse was indicated. Prior to the visit, a file review reconfirmed the potential environmental concerns with respect to the final disposition of this site.

During the visit and onsite interview with the property owner, it was decided based on field observations that samples of soils at limited but specific locations could provide the information necessary to evaluate the degree of hazard posed by this site. These samples will be used in conjunction with the Site Inspection Report to properly determine a final disposition for this site. Because of the nature and persistence of the compounds known and observed onsite and the potential for environmental and human contact, I believe a medium priority for inspection is warranted at this time.

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JOE D. TANNER
Commissioner

J. LEONARD LEDBETTER
Division Director

# Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334

August 14,1984

Mr. Walton Jones
RCRA 3012 Project Officer
U.S. Environmental Protection Agency
345 Courtland Street, Region IV
Atlanta, Georgia 30365

Dear Mr. Jones:

Enclosed is a list of site names, addresses or locations, and discovery dates that have been identified through our Uncontrolled Hazardous Waste Site Discovery Program. Please add these sites to the ERRIS list and notify us of the Environmental Protection Agency identification number assigned to each as soon as possible.

If you have any questions, feel free to contact me at 656-7404.

Sincerely,

Joseph T. Surowiec
Unit Coordinator
Remedial Actions Unit

JTS:cpl
Enclosure

cc: John D. Taylor, Jr.
File

AN AFFIRMATIVE ACTION/EQUAL EMPLOYMENT OPPORTUNITY EMPLOYER

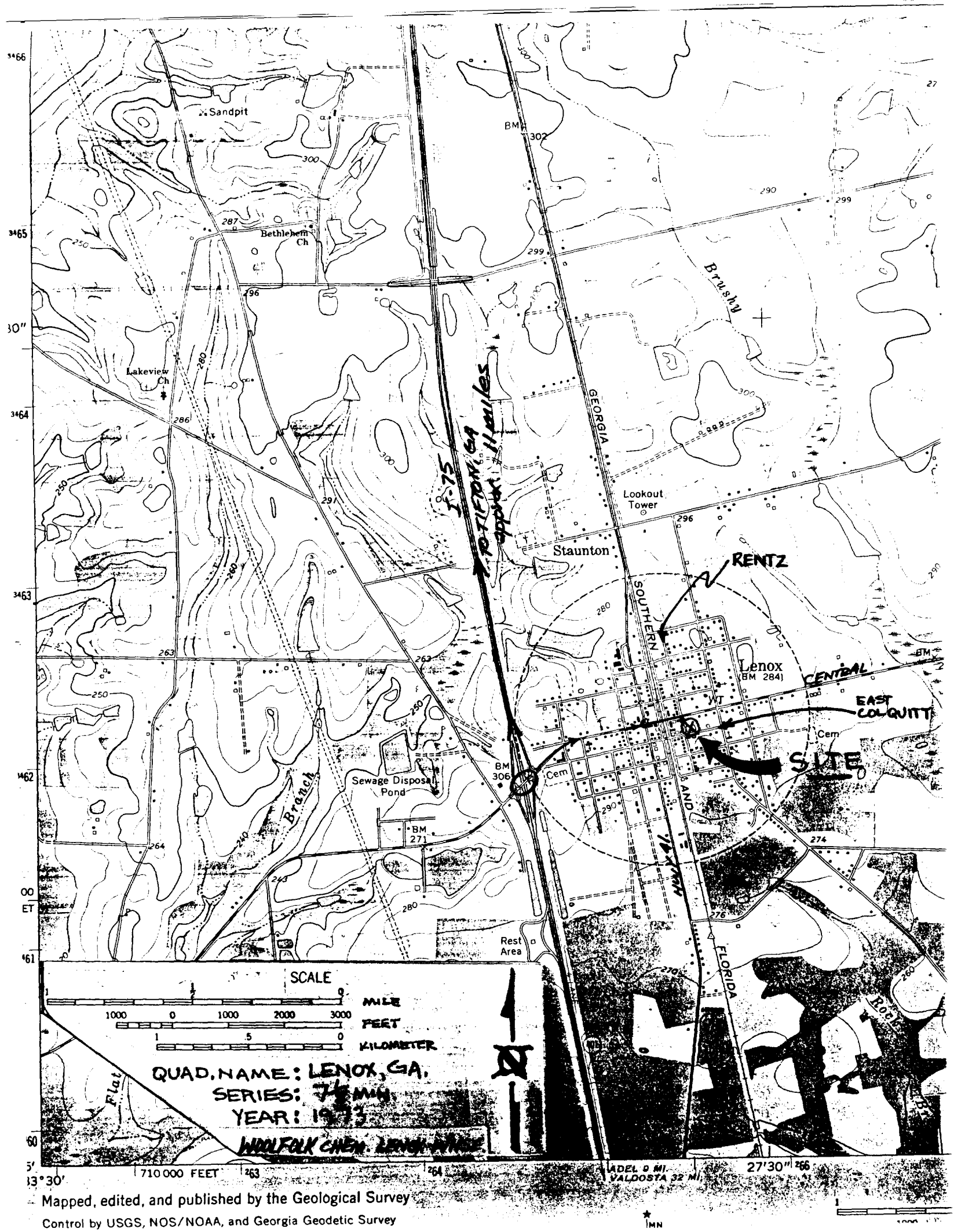
DATE 14AUG84

-ENCLOSURE-

UNCONTROLLED HAZARDOUS WASTE SITE(S)

(ERRIS ADDITIONS)

| SITE NAME | SITE ADDRESS OR LOCATION (COUNTY) | DISCOVERY DATE |
|---|---|---|
| WOOLFOLK CHEMICALS LENOX WAREHOUSE | Abandoned Former Warehouse located at the corner of Rentz and "E." Colquitt Streets in Lenox, Ga. COOK COUNTY, GA. From the intersection of I-75 and Central Ave. (Lenox, Ga. EXIT #13) proceed East on Central past intersection with Hwy. 41 over railroad tracks to intersection with Rentz. Turn right (South) onto Rentz and proceed one block to Warehouse on the left. Coordinates: N 31° 16' 17" W 83° 27' 45" See attached map for location details | 14AUG84 |

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ENVIRONMENTAL PROTECTION DIVISION
Industrial and Hazardous Waste Management Program

# ACTION REPORT

AIC RAU

| | | | | | |
|---|---|---|---|---|---|
| ACTION BY: | T. WESTBROOK | REVIEWED BY: | | RECORDED BY: | |
| SEQUENCE NUMBER: | New Site | DATE REVIEWED: | 8/14 | DATE RECORDED: | |

| | | | | | |
|---|---|---|---|---|---|
| FACILITY NAME: | Woolfolk Chemicals Lenox WHSE. | | | FACILITY ID NO: | — |
| MAIL STREET: | 103 Magnolia Dr. | | | MAIL CITY: | Tifton |
| MAIL STATE: | GA. | MAIL ZIP: 31794 | LOCATION PHONE: (912) 386-1300 | SIC CODE: | |
| MAIL CONTACT: | ~~MR.~~ MS. | FIRST NAME: Bobby | | LAST NAME: | Lindsey |
| LOCATION CITY: | LENOX | | | LOCATION COUNTY: | Cook |
| ACTIVITY CODE: | AIO | MAJOR (M): | | COMPLIANCE OFFICER: | WESTBROOK |
| PERMIT NUMBER OR STATUS: | | | | GROUNDWATER STATUS CODE: | |

| PROCESS CODES | T01 TANK | T02 SF IM | T03 INCIN | T04 OTHER | S01 CONT | S02 TANK | S03 WS PL | S04 SF IM | D80 LD FL | D81 LD AP | D83 SF IM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| IN USE | | | | | | | | | | | |

| AREA OF VIOLATION: | GWM | INC | CLO | MAN | FIN | SCH | PTB | OTH |
|---|---|---|---|---|---|---|---|---|
| CLASS OF VIOLATION: | | | | | | | | |

| | | | |
|---|---|---|---|
| ACTION TAKEN: | 11 Conduct Sampling Inspection | DATE OF ACTION: | 840302 |
| FINDING/ DECISION: | 86 - Request Addtl. Info. - "Lab" | FIELD HOURS: 6 | TOTAL HOURS: 12 |
| NEXT ACTION: | 50 Rev. Addtl. Info | FOLLOW-UP DATE: | 840830 |

| | | | |
|---|---|---|---|
| ACTION TAKEN (2): | 53 Review (file info) | DATE OF ACTION (2): | 840913 |
| FINDING/ DECISION (2): | 98 Closed Site Exists | FIELD HOURS (2): | TOTAL HOURS (2): 4 |
| NEXT ACTION (2): | 38 Continue PA | FOLLOW-UP DATE (2): | [illegible] |

| | | |
|---|---|---|
| PROJECTED CEASED VIOLATION DATE: | PENALTY ASSESSED: $ | PENALTY COLLECTED: $ |

ADDITIONAL DOCUMENTATION WILL BE PREPARED. YES (✓) NO ( ) (CHECK ONE)

COMMENTS:

[illegible]

2/20/84

Facility name: Woolfolk Chemical Works, Inc.

Location: Fort Valley, Georgia

EPA Region: IV

Person(s) in charge of the facility:

Name of Reviewer: David A. Brackett Date: 2-6-85

General description of the facility:

(For example: landfill, surface impoundment, pile, container; types of hazardous substances; location of the facility; contamination route of major concern; types of information needed for rating; agency action, etc.)

Woolfolk Chemical Works had been in the pesticide formulation business since 1910. The "de minimis" loss of product over the years has resulted in significant soil and ground-water contamination. The municipal water supply of Fort Valley is threatened by this contamination.

Scores: $S_M$ = ~~31.5~~ 30.85 ($S_{gw}$ = ~~52.3~~ 53.33 $S_{sw}$ = ~~10.9~~ 0 $S_a$ = 0 )

$S_{FE}$ = Not Ranked

$S_{DC}$ = 33.3

**FIGURE 1**
**HRS COVER SHEET**

## M.2 - SITE MAINTENANCE FORM

* ACTION: _ *

EPA ID : GAD082832841

SITE NAME: WOOLFOLK CHEM WRKS LENOX WHSE SOURCE: R

STREET : RENTZ & EAST COLQUITT CONG DIST: 02

CITY : LENOX ZIP: 31637

CNTY NAME: COOK CNTY CODE : 075

LATITUDE : 31/16/17.0 LONGITUDE : 083/27/45.0

LL-SOURCE: R LL-ACCURACY:

SMSA : HYDRO UNIT: 03110204

INVENTORY IND: Y REMEDIAL IND: Y REMOVAL IND: N FED FAC IND: N

NPL IND: N NPL LISTING DATE: NPL DELISTING DATE:

SITE/SPILL IDS:

RPM NAME: RAY WILKERSON RPM PHONE: 404-347-2234

SITE CLASSIFICATION: SITE APPROACH:

DIOXIN TIER: REG FLD1: REG FLD2:

RESP TERM: PENDING ( ) NO FURTHER ACTION ( ) * PENDING (_) NO FURTHER ACTION (_) *

ENF DISP: NO VIABLE RESP PARTY ( ) VOLUNTARY RESPONSE ( )
ENFORCED RESPONSE ( ) COST RECOVERY ( )

SITE DESCRIPTION:

M.2 - PROGRAM MAINTENANCE FORM

ACTION: _

SITE: WOOLFOLK CHEM WRKS LENOX WHSE

EPA ID: GAD082832841 PROGRAM CODE: H01 PROGRAM TYPE: _

PROGRAM QUALIFIER: ALIAS LINK :

PROGRAM NAME: SITE EVALUATION

DESCRIPTION:

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: WOOLFOLK CHEM WRKS LENOX WHSE
PROGRAM: SITE EVALUATION

EPA ID: GAD082832841 PROGRAM CODE: H01 EVENT TYPE: DS1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: E * _ ___ _ *

EVENT NAME: DISCOVERY STATUS: * _____ _ *

DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

| ORIGINAL | CURRENT | ACTUAL | | | |
|---|---|---|---|---|---|
| START: | START: | START: | __/__/__ | __/__/__ | __/__/__ |
| COMP : | COMP : | COMP : 04/01/84 | __/__/__ | __/__/__ | __/__/__ |

HQ COMMENT:

* _____ *

RG COMMENT:

* _____ *

| COOP AGR # | AMENDMENT # | STATUS | STATE % | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 | _____ | _____ | __ | ___ |

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: WOOLFOLK CHEM WRKS LENOX WHSE
PROGRAM: SITE EVALUATION

EPA ID: GAD082832841 PROGRAM CODE: H01 EVENT TYPE: PA1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: S * _ ___ _ *

EVENT NAME: PRELIMINARY ASSESSMENT STATUS: * _____ _ *

DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

| ORIGINAL | CURRENT | ACTUAL | | | |
|---|---|---|---|---|---|
| START: | START: | START: 09/01/84 | __/__/__ | __/__/__ | __/__/__ |
| COMP : | COMP : | COMP : 09/01/84 | __/__/__ | __/__/__ | __/__/__ |

HQ COMMENT:

* _____ *

RG COMMENT:

* _____ *

| COOP AGR # | AMENDMENT # | STATUS | STATE % | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 | _____ | _____ | __ | ___ |

M.2 - EVENT MAINTENANCE FORM

* ACTION: _ *

SITE: WOOLFOLK CHEM WRKS LENOX WHSE
PROGRAM: SITE EVALUATION

EPA ID: GAD082832841 PROGRAM CODE: H01 EVENT TYPE: SI1

FMS CODE: EVENT QUALIFIER : EVENT LEAD: S * _ ___ _ *

EVENT NAME: SITE INSPECTION STATUS: * _____ _ *

DESCRIPTION:

* _____ *
* _____ *
* _____ *
* _____ *

| ORIGINAL | CURRENT | ACTUAL | | | |
|---|---|---|---|---|---|
| START: | START: | START: 03/01/85 | __/__/__ | __/__/__ | __/__/__ |
| COMP : | COMP : | COMP : 03/01/85 | __/__/__ | __/__/__ | __/__/__ |

HQ COMMENT:

* _____ *

RG COMMENT:

* _____ *

| COOP AGR # | AMENDMENT # | STATUS | STATE % | | | | |
|---|---|---|---|---|---|---|---|
| | | | 0 | _____ | _____ | __ | ___ |

| RECORD OF COMMUNICATION | ☒ PHONE CALL ☐ DISCUSSION ☐ FIELD TRIP ☐ CONFERENCE ☐ OTHER (SPECIFY) From Jim Lindsey (404) 657-[illegible] (Record of item checked above) | |
|---|---|---|
| TO: Ruth Crist | FROM: Ken Weeks | DATE 7-22-85 TIME |

SUBJECT Vacuum cleaning at Warehouse Fire, Lenox, Ga.

SUMMARY OF COMMUNICATION

Remarks calls to Mr. Bob Lucas, (912) 324-4[illegible] (Time Critical) would like Agency to further clean up of vacuum cleaning 7/21. Warehouse contains agricultural chemicals pesticides.

- Also would like Agency to approve use of the concrete slab foundation/parking lot over structure removal.
- C.H. Clean up Services and Mop-up Crew Washington (Mr. Terry) [illegible] NAS [illegible] EPD etc.
- Ga. EPD [illegible] the [illegible] and [illegible] the [illegible] of the contaminated [illegible].

CONCLUSIONS, ACTION TAKEN OR REQUIRED

No action necessary. Ga. EPD has taken the lead. Mr. Lindsey is trying to get the Agency to do the work which he is being expected to do by EPD.

Ga. EPD contact familiar with site: Tom Weatherby. [illegible] Cecilia Wanney [illegible]

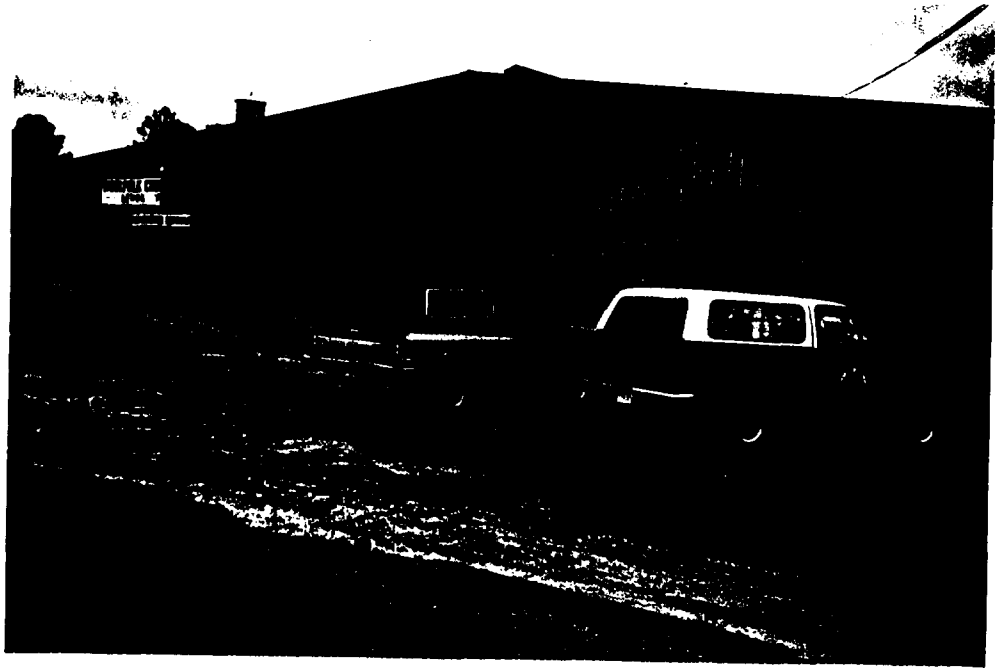
INFORMATION COPIES

TO: Cecilia Wanney, Region

EPA Form 1300-6 (7-72) REPLACES EPA HQ FORM 9300-3 WHICH MAY BE USED UNTIL SUPPLY IS EXHAUSTED.

# POOR LEGIBILITY

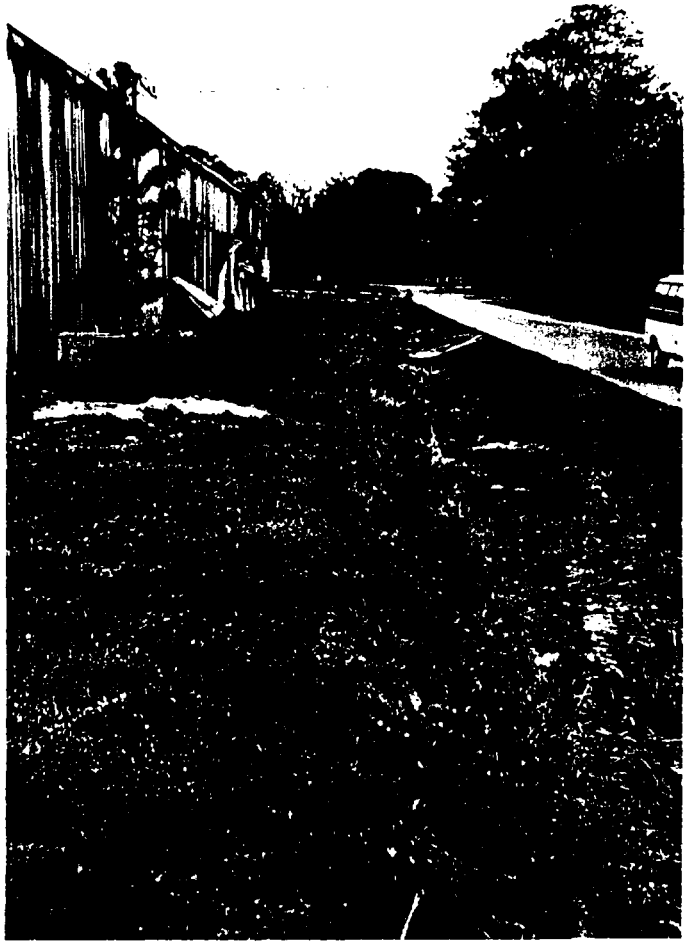
## PORTIONS OF THIS DOCUMENT MAY BE UNREADABLE, DUE TO THE QUALITY OF THE ORIGINAL



Woolfolk Chemical Co. warehouse.

Backview facing south.Warehouse is located in a residential area within the city limits.

Views inside warehouse, all stored chemicals and contaminated materials inside the warehouse were removed. Contaminated insulation on the roof and walls were removed also. Work was performed by O&H Materials.



Ditch along southside of warehouse.
Firefighting runoff water entered
this ditch during fire in 7/81.
water samples taken in 1981 indicated
10-263 ppm Toxaphene was present.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY 27233

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

August 18, 1994

4WD-SSRB

MEMORANDUM

Subject: Remedial Design Work Plan
Woolfolk Chemical Works Site
Fort Valley, Georgia

From: Timothy R. Woolheater
Remedial Project Manager

To: See Attached List

Attached for your review is the Work Plan for Superfund Remedial Design for Operable Unit #1, Groundwater, at the Woolfolk Chemical Works Site in Fort Valley, Georgia. The document has been submitted in accordance with the Unilateral Administrative Order for Remedial Design and Remedial Action, EPA Docket No. 94-25-C. The Superfund account number for this site is TGB04DPW1.

To facilitate and maximize the effectiveness of the peer review process, it is requested that the various peer reviewers focus their efforts on the specific sections of the documents as listed below. Peer review comments received by **September 15, 1994** will be considered in the finalization of these documents. Your assistance is greatly appreciated.

| Document/Section/Name | Peer Review Support Group |
|---|---|
| **Work Plan** | |
| 1.0 Introduction | ESD-HWS, OHA, GWTU, ORC, NOAA |
| 2.0 Technical Scope of Work | Same as 1.0 |
| 3.0 Remedial Design Schedule | ORC, GWTU |
| 4.0 Project Management Plan | ESD-HWS, GWTU, |
| **Field Sampling and Analysis Plan** | |
| 1.0 Introduction | OHA, ESD-HWS, ESD-LE&QAS, GWTU, NOAA |
| 2.0 G.W. Monitoring Wells | Same as 1.0 |
| 3.0 Sampling Procedures | ESD-HWS, GWTU |
| 4.0 Field Records, Sample Control, | ESD-HWS, ESD-LE&QAS |

Printed on Recycled Paper

| | |
|---|---|
| 5.0 Decontamination | ESD-HWS |
| 6.0 Investigation-derived Waste | ESD-HWS |

**Treatability Study Work Plan**

| | |
|---|---|
| All Sections | ESD-HWS, ESD-LE&QAS, GWTU, OHA, NOAA |

**QAPP**

| | |
|---|---|
| All Sections | ESD-HWS, ESD LE-QAS |

**Health and Safety Plan**

| | |
|---|---|
| All Sections | ESD-HWS, HSO |

Should there be any question about this review, please contact me at (404) 347-3555 (x6248). Thank you for your consideration.

Addresses:

Elmer Akin, Office of Health Assessment
William Bokey, ESD-HWS
Charles Hooper, ESD-LE&QAS
David Hill, GWTSU
Simon Miller, ORC
Waynon Johnson, NOAA
Walter Dipietro (H&SP only)

# Work Plan for Superfund Remedial Design for Operable Unit No. 1 Ground Water

# at

# Woolfolk Chemical Works Superfund Site Fort Valley, Georgia

*August, 1994*

*Prepared by:*

**ERM-Southeast, Inc.**
300 Chastain Center Blvd.
Suite 375
Kennesaw, Georgia 30144

List of Tables iii
List of Figures iv
List of Appendices v

1.0 INTRODUCTION . . . . . 1-1

1.1 SITE DESCRIPTION . . . . . 1-1
1.1.1 Location . . . . . 1-1
1.1.2 Site History . . . . . 1-2
1.1.3 Demography and Land Use . . . . . 1-2
1.1.4 Physiography and Topography . . . . . 1-2
1.1.5 Hydrogeology . . . . . 1-3
1.1.6 Ecology . . . . . 1-5

1.2 SUMMARY OF EXISTING GROUND WATER DATA . . . . . 1-6
1.2.1 Surficial Aquifer . . . . . 1-6
1.2.2 Upper Cretaceous Water Table Aquifer . . . . . 1-8
1.2.3 Upper Cretaceous Confined Aquifer . . . . . 1-9
1.2.4 Tuscaloosa Aquifer . . . . . 1-10
1.2.5 Conclusions on Distribution of Chemicals . . . . . 1-11

1.3 SUMMARY OF PREVIOUS RESPONSES . . . . . 1-11

1.4 STATEMENT OF THE PROBLEM AND RD/RA STRATEGY . . . 1-15
1.4.1 Statement of Problem . . . . . 1-15
1.4.2 Work Plan Objectives . . . . . 1-17
1.4.3 RD/RA Strategy . . . . . 1-18

1.5 WORK PLAN ORGANIZATION . . . . . 1-20

2.0 TECHNICAL SCOPE OF WORK . . . . . 2-1

2.1 PREDESIGN INVESTIGATIONS . . . . . 2-1
2.1.1 Aquifer Testing . . . . . 2-1
2.1.2 Treatability Studies . . . . . 2-3
2.1.2.1 Overview of ROD Remedy . . . . . 2-3
2.1.2.2 Overview of Previous Coprecipitation Treatability Studies . . . . . 2-4
2.1.2.3 Approach to RD Treatability Studies for this Site . . . . . 2-5
2.1.3 Treated Ground Water Disposal Options . . . . . 2-8
2.1.3.1 POTW Discharge . . . . . 2-8
2.1.3.2 Contingency Discharge Alternatives . . . . . 2-9
2.1.4 Predesign Report . . . . . 2-11

2.2 ENGINEERING DESIGN . . . . . 2-11
2.2.1 Design Phases . . . . . 2-11
2.2.2 Preliminary (30%) Design . . . . . 2-12
2.2.3 Intermediate (60%) Design . . . . . 2-14
2.2.4 Pre-Final (90%) Design . . . . . 2-17
2.2.5 Final (100%) Design . . . . . 2-22

2.3 MONITORING WELL ABANDONMENT . . . . . 2-22

2.4 ADDITIONAL DELINEATION & POST STARTUP WORK . . . . . 2-23
2.4.1 Confirmation of Aquifer Parameters . . . . . 2-23
2.4.2 Ground Water Sampling of Existing Wells . . . . . 2-23
2.4.3 Revised Sampling and Analysis Plan (Ground Water Delineation) . . 2-24
2.4.4 Field Scale Treatability Study and System Modification Plan . . . . . 2-24

2.5 INTERIM REMEDIAL ACTION . . . . . 2-24

3.0 REMEDIAL DESIGN SCHEDULE . . . . . 3-1

4.0 PROJECT MANAGEMENT PLAN . . . . . 4-1
4.1 OBJECTIVES . . . . . 4-1
4.2 DATA MANAGEMENT PLAN . . . . . 4-1
4.2.1 Data Collection and Documentation . . . . . 4-1
4.2.1.1 Requirements . . . . . 4-1
4.2.1.2 Data Control . . . . . 4-2
4.2.1.3 Procedures . . . . . 4-3
4.2.2 Laboratory Analytical Data Validation Procedures . . . . . 4-6
4.2.2.1 Purposes . . . . . 4-6
4.2.2.2 Responsibilities . . . . . 4-6
4.2.2.3 Procedures . . . . . 4-6
4.2.3 Project Filing Requirements . . . . . 4-9
4.2.3.1 Purpose . . . . . 4-9
4.2.3.2 Procedure . . . . . 4-9
4.2.4 Data Reporting . . . . . 4-12
4.2.5 Report Storage . . . . . 4-13
4.2.6 Data Flow . . . . . 4-13
4.3 PROGRESS REPORTING . . . . . 4-14
4.4 PROPOSED MEETINGS WITH THE EPA . . . . . 4-14
4.5 PROJECT MANAGEMENT . . . . . 4-15

5.0 COMMUNITY RELATIONS SUPPORT . . . . . 5-1

## LIST OF TABLES


| | |
|---|---|
| Table 1-1 | Summary of RI Analytical Parameters for Ground Water |
| Table 1-2 | Ground Water Sampling Summary |
| Table 1-3 | Ground Water Performance Standards |
| Table 1-3 | Work Plan and Report Requirements |
| Table 2-1 | Preliminary Drawing List |
| Table 2-2 | Preliminary Specification List |
| Table 2-3 | Plume Delineation Efforts: Existing Wells to be Sampled |
| Table 4-1 | Items Typically Reviewed During Data Validation |
| Table 4-2 | Water Level Data Summary |

## LIST OF FIGURES


| | |
|---|---|
| Figure 1-1 | Site Location |
| Figure 1-2 | Hydrogeologic Cross-Section of Site |
| Figure 1-3 | Locations of Ground Water Monitoring Wells |
| Figure 2-1 | Proposed Wells for Aquifer Testing |
| Figure 2-2 | Proposed Locations for Infiltration Tests |
| Figure 2-3 | Monitoring Wells Proposed for Abandonment |
| Figure 4-1 | Example of Field Log |
| Figure 4-2 | ERM Daily Report |
| Figure 4-3 | ERM Drilling Log |
| Figure 4-4 | Water Level Data Summary |
| Figure 4-5 | Traffic Report |
| Figure 4-6 | Analysis Request and Chain of Custody Report |
| Figure 4-7 | Estimated Water Table Contours |
| Figure 4-8 | Summary of Field and Analytical |
| Figure 4-9 | Organization Chart |

## APPENDICES


A. Field Sampling and Analysis Plan
B. Treatability Study Work Plan
C. QAPP
D. Health and Safety Plan
E. Example Progress Report
F. Engineering Contractor Resumes

## *1.0 INTRODUCTION*

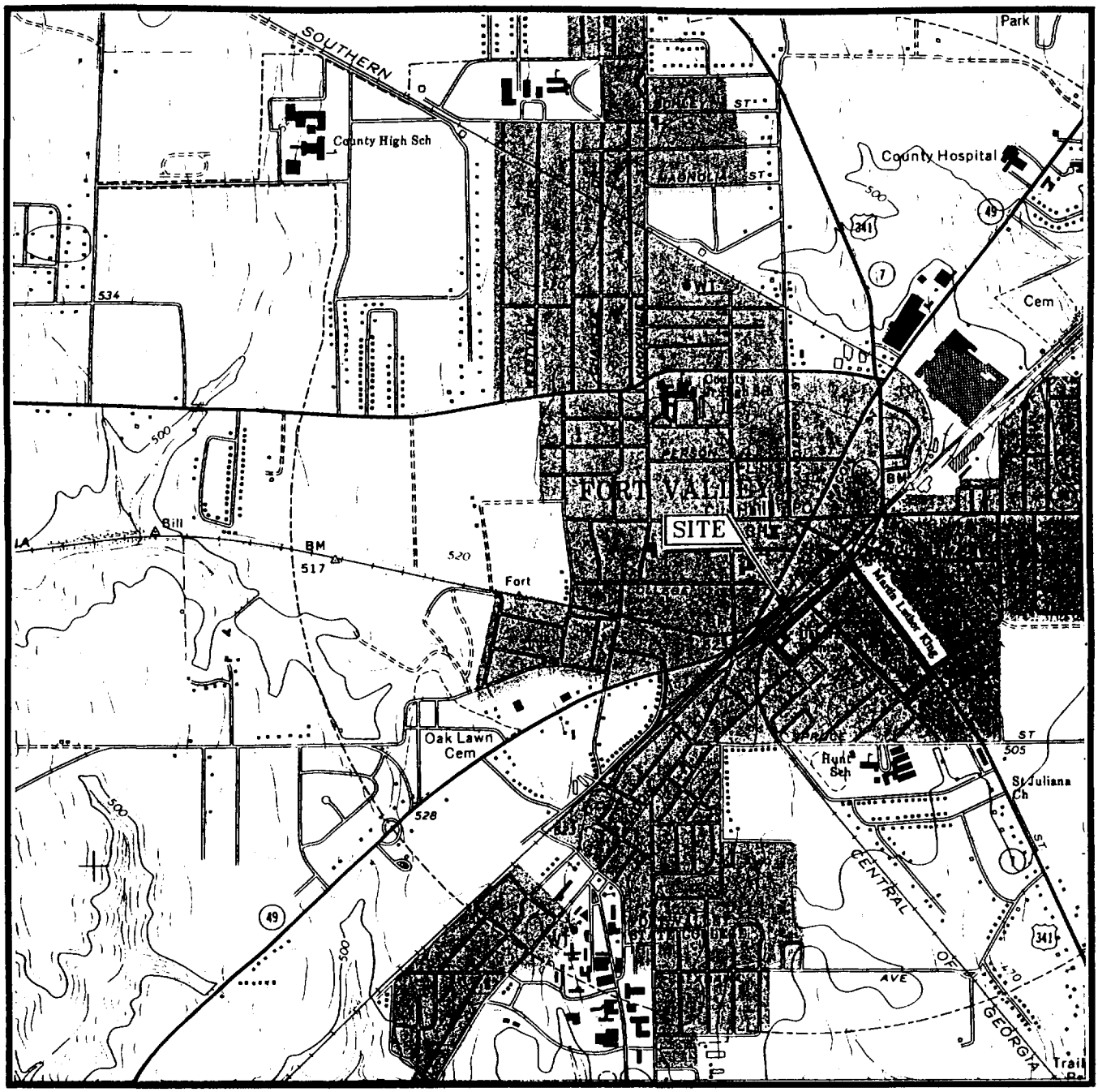
This document is the Work Plan for preparing the Remedial Design (RD) for Operable Unit 1, Ground Water Contamination, at the Woolfolk Chemical Works Site (the Site) located in Fort Valley, Georgia. This Work Plan is being submitted as partial fulfillment of requirements set forth in the U.S. Environmental Protection Agency's (U.S.EPA) Unilateral Administrative Order, (UAO), U.S.EPA docket No. 94-25-C. The effective date of this order is June 3, 1994.

## *1.1 SITE DESCRIPTION*

### *1.1.1 Location*

The Woolfolk Site is located at Preston and Pine Streets within the central business district of Fort Valley, Georgia (Figure 1-1). It is located in a commercial area surrounded by residences. The Site includes 18 acres of the former Woolfolk Chemical Works. The majority of the Site is surrounded by 6-foot to 8-foot high chainlink fence. Thirteen buildings are situated on the property, and a pecan orchard is located at the southeastern end of the site. The grounds near the buildings are paved or graveled and the undeveloped areas are grassy. Several above-ground tanks, some of which are currently in use, are located north and east of Building S.

Businesses currently operating at the Site include companies owned by Peach County Properties, Inc. (also known as SURECO), Georgia Ag Chem, and the Marion Allen Insurance and Realty Company. Residences are located to the west and east of the Site, and homes adjoin the pecan orchard to the southeast. Several businesses and light industries are located along the north and east ends of the former Woolfolk Chemical Works.




1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 1/2 0 1 KILOMETER

SCALE 1:24000

GEORGIA

QUADRANGLE LOCATION

ERM-Southeast, Inc.
Kennesaw, Georgia

ERM

# SITE LOCATION

WORK PLAN FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 1-1

4401SLOC.DWG 07-26-94 AM 1=1 TWK

### *1.1.2 Site History*

Throughout its history, the Woolfolk facility has been used for the production and packaging of organic and inorganic insecticides (including arsenic and lead-based products), pesticides, and herbicides. During World War II an inorganic intermediate (arsenic trichloride) was reportedly produced at the Site for the War Production Board. Production was expanded during the 1950s to include the formulation of various organic pesticides, including dichlorodiphenyltrichlorethane (DDT), lindane, toxaphene, and other chlorinated pesticides. These organic pesticides and other insecticides and herbicides were formulated, packaged, or warehoused at the Site.

### *1.1.3 Demography and Land Use*

According to the 1980 Census, the City of Fort Valley has a population of approximately 9,000. The area immediately surrounding the Woolfolk Site is a mixture of residential and light industrial land uses. There are two churches near the Site. Fort Valley is the home of Fort Valley State College. The primary land use for the area around Fort Valley is 40 percent croplands and 16 percent woodlands, with the remainder being occupied by incorporated towns, highway systems and light industry (U.S. Department of Agriculture [USDA] 1967).

### *1.1.4 Physiography and Topography*

The Woolfolk Site is located in what is physiographically known as the Fort Valley Plateau District. This district lies within the Coastal Plain Province of Georgia just south of the "fall line," which marks the boundary between the Piedmont and Coastal Plain Physiographic Provinces. This district is characterized by broad, flat to very gently rolling surfaces, sloping gently to the

southeast. Surface soils are moderately well-drained and generally consist of sandy and silty clays to clayey and silty sands.

Several southeast flowing creeks dissect the Fort Valley Plateau District. The district is bounded to the west by the Flint River and on the east by the Ocmulgee River. Although the Flint river borders this district along its western boundary, almost the entire district lies within the drainage basin of the Ocmulgee River. Land surface elevations at the Woolfolk Site range from approximately 516 feet above mean sea level (msl) at the northern end of the Site to about 510 feet msl at the southern end. The Site is flat to gently sloping from north to south. The slope at the Site is generally about 1:100 (vertical:horizontal), or 1 percent. A man-made mound (Area I RCRA-type cap) installed as part of earlier remediation activities, approximately 170 feet by 300 feet, with a maximum elevation of about 520 feet msl, has been constructed at the north central portion of the Site. Other minor mounds or depressions at the Site exist due to either past operation or other remediation activities.

### *1.1.5 Hydrogeology*

The Site, a hydrogeologic cross-section of which is shown on Figure 1-2, is underlain by several hundred feet of unconsolidated sediments consisting of interbedded layers of sand, silt, and clay. From the surface to a depth of about 35 feet are silty and sandy clays and sand. The lower, sandy parts of this interval contain ground water in a unit designated in this Work Plan as the Surficial Aquifer.

In the interval between depths of about 35 to 75 feet is a thick unit of clay consisting primarily of kaolin. The top surface of the clay unit is irregular in its topography. The kaolin unit appears to be continuous under most of the Site.

Due to the dense, clayey nature of the kaolin, the layer serves as a perching layer for the Surficial Aquifer. For the purposes of this Work Plan, the kaolin is designated as the Surficial Perching Unit.

Beneath the kaolin unit are Upper Cretaceous interbedded sands and clayey and silty sands to a depth of about 105 to 110 feet. At a depth of about 100 feet the sandy materials that are present are saturated. In the interval between about 105 and 125 feet deep, there is a greater amount of silty and clayey material; the thickness and vertical distribution of this material are variable and it may not be present to the northeast of the Site. The geologic materials in which the water table occurs are designated as the Upper Cretaceous Water Table Aquifer and include the clayey and silty materials of the underlying unit.

From depths of about 125 feet to 280 feet there is an alternating sequence of sands, clays, and clayey sands. At the top of the sequence is a layer of sand about 20 feet thick. This sand is considered in this Work Plan as part of the Upper Cretaceous Confined Aquifer. The individual alternating layers of sands, clays and clayey sands beneath this sand are typically less than 10 feet thick; their combined thickness is about 70 feet.

At a depth of about 275 feet is the Tuscaloosa Aquifer. Sediments that comprise this aquifer are dominated by medium to coarse-grained sand. The sands are clayey and silty in some locations.

Ground water movement in the Surficial Aquifer is generally toward the southeast. Leakage is probably occurring through the Surficial Perching Unit from the Surficial Aquifer into the Upper Cretaceous sediments below. The water table in the Upper Cretaceous sediments indicates the potential for ground water movement generally toward the north and northeast beneath most of the Site. In

the southeast portion of the Site, however, the potential for ground water movement is towards the east.

The hydraulic head contours in the Upper Cretaceous Confined Aquifer generally conform to those of the Upper Cretaceous Water Table Aquifer, indicating the potential for ground water movement primarily to the northeast and east. There is also a component of the flow towards the northwest in the Upper Cretaceous Confined Aquifer, along the northwest side of the Site. Heads in the Upper Cretaceous Confined Aquifer are typically below those of the water table, indicating the potential for vertical ground water movement from the Upper Cretaceous Water Table Aquifer into the Upper Cretaceous Confined Aquifer.

Hydraulic head measurements in the Tuscaloosa Aquifer beneath most of the Site indicate the potential for ground water movement toward the southeast. These measurements also show a reversal in ground water flow direction in and beyond the Northwestern part of the Site. There, the direction of flow is toward the northwest, consistent with the expected effects of pumping ground water from city water production wells located northeast of the Site.

### *1.1.6 Ecology*

Information obtained during the Remedial Investigation (RI) from the Peach County Health Department, Chamber of Commerce, and visual observations indicate that there are no sensitive habitats or endangered species on the Site. The U.S. Fish and Wildlife Service has identified the red-cockaded woodpecker and the bald eagle as endangered species and state-protected wildlife within Peach County. These species have not been observed at the Site.

## *1.2 SUMMARY OF EXISTING GROUND WATER DATA*

Since 1982, several ground water investigations have been conducted at the site. These investigations have included the installation of 49 ground water monitoring wells. The locations of these are shown on Figure 1-3. These wells have been completed in to the Surficial Aquifer, the Surficial Perching Unit, the Upper Cretaceous Water Table Aquifer, the Upper Cretaceous Confined Aquifer, and the Tuscaloosa Aquifer.

As part of the RI, ground water samples were collected during two phases of work. Table 1-1 presents a summary of the parameters for which the ground water samples were analyzed during the RI. During the Phase I sampling, 32 wells were sampled. During Phase II, 17 wells were sampled. These 17 wells included two production wells operated by the City of Fort Valley and completed into the Tuscaloosa Aquifer. Table 1-2 summarizes the number and types of analytical samples collected from each well sampled during Phase I and Phase II field activities. The following discussion presents the results of the analyses for Phase I and Phase II ground water samples for the aforementioned aquifers. It should be noted that those wells screened in the Surficial Perching Unit are probably hydraulically connected to the Surficial Aquifer. Consequently, a discussion of the results of the analyses for these wells is included with the discussion of the analytical results for the Surficial Aquifer.

### *1.2.1 Surficial Aquifer*

***Pesticides.*** Pesticides were detected in seven of the 11 Surficial Aquifer wells sampled during the RI. These included alpha, beta, and gamma-BHC, (lindane), DDT and endosulfan I. Lindane was detected most frequently and values ranged from 0.0005 mg/L in MW-4B to 0.0083 mg/L. The highest detected

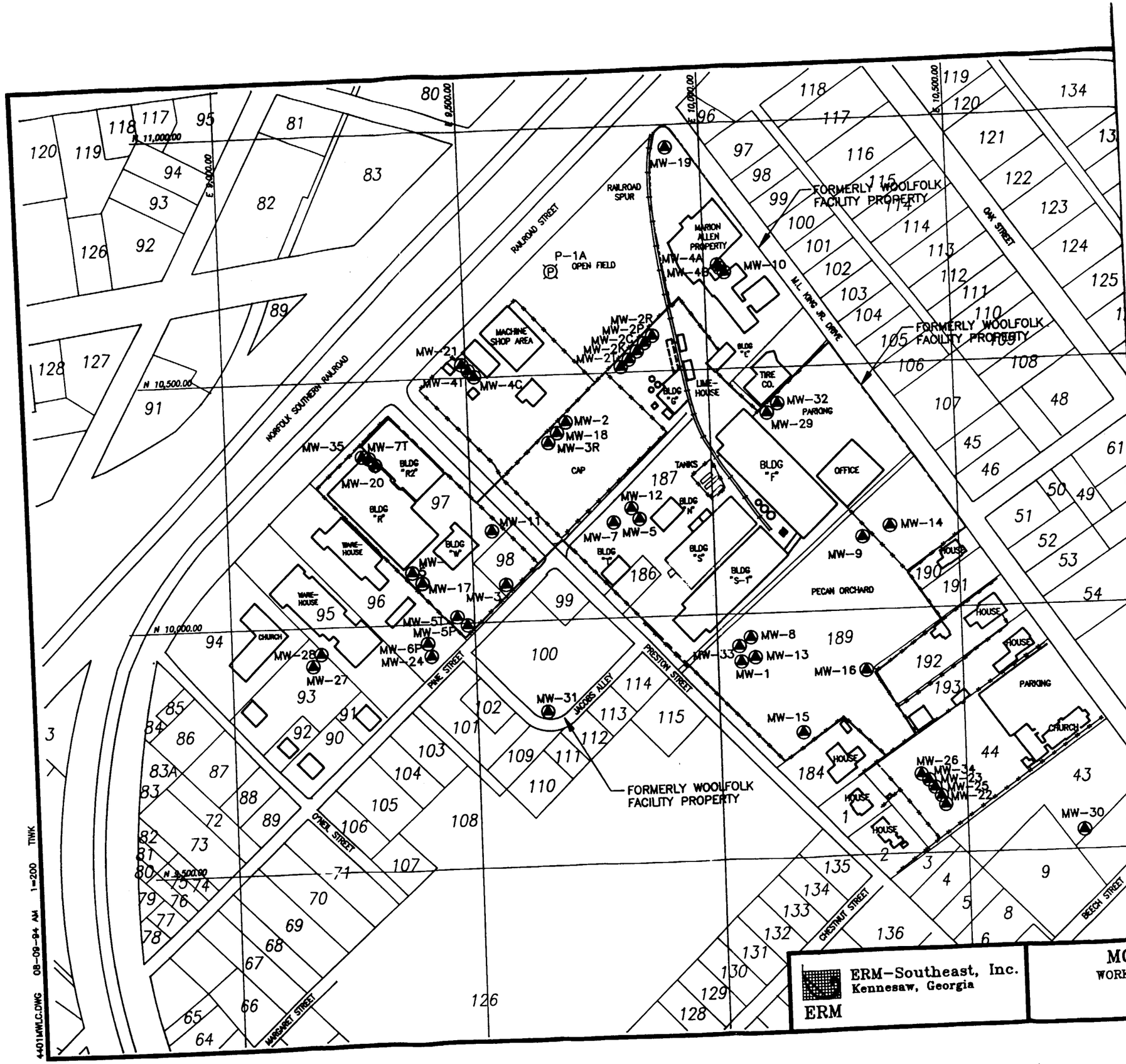

RAILROAD SPUR
RAILROAD STREET
P-1A
OPEN FIELD
MARION ALLEN PROPERTY
MW-19
MW-4A
MW-4B
MW-10
FORMERLY WOOLFOLK FACILITY PROPERTY
M.L. KING JR. DRIVE
OAK STREET
MACHINE SHOP AREA
MW-21
MW-41
MW-4C
MW-2R
MW-2P
MW-2C
MW-2R
MW-21
BLDG "C"
LIME-HOUSE
BLDG "G"
TIRE CO.
MW-32
PARKING
MW-29
NORFOLK SOUTHERN RAILROAD
MW-35
MW-7T
BLDG "RZ"
MW-20
BLDG "K"
MW-2
MW-18
MW-3R
CAP
TANKS
BLDG "F"
OFFICE
MW-12
BLDG "K"
MW-7
MW-5
BLDG "T"
BLDG "S"
BLDG "S-1"
MW-11
MW-14
MW-9
PECAN ORCHARD
HOUSE
WARE-HOUSE
MW-17
MW-3
MW-51
MW-5P
MW-6P
MW-24
CHURCH
MW-28
MW-27
PINE STREET
MW-31
JACOBS ALLEY
PRESTON STREET
MW-8
MW-13
MW-1
MW-33
MW-16
MW-15
PARKING
CHURCH
MW-26
MW-34
MW-23
MW-25
MW-22
MW-30
FORMERLY WOOLFOLK FACILITY PROPERTY
CHECK STREET
MARGARET STREET
CHESTNUT STREET
BEECH STREET
N 11,000.00
N 10,500.00
N 10,000.00
N 9,500.00
E 9,000.00
E 9,500.00
E 10,000.00
E 10,500.00
ERM-Southeast, Inc.
Kennesaw, Georgia
ERM
MON
WORK
4401MWLC.DWG 08-09-94 AM 1=200 TIWK

**TABLE 1-1**
**SUMMARY OF RI ANALYTICAL PARAMETERS**
**for Ground Water**
**Woolfolk Chemical Works RD/RA**
**Fort Valley, GA**

| PESTICIDES | |
|---|---|
| 4,4'DDD | BHC-Delta |
| 4,4'-DDE | BHC-Gamma (Lindane) |
| 4,4'-DDT | Dieldrin |
| Aldrin | Endosulfan I |
| Alpha-Chlordane | Endosulfan II |
| Aroclor-1016 | Endosulfan Sulfate |
| Aroclor-1221 | Endrin |
| Aroclor-1232 | Endrin Ketone |
| Aroclor-1242 | Gamma-Chlordane |
| Aroclor-1248 | Heptachlor |
| Aroclor-1254 | Heptachlor Expoxide |
| Aroclor-1260 | Methoxychlor |
| BHC-Alpha | Toxaphene |
| BHC-Beta | |
| **INORGANIC CONSTITUENTS (TAL METALS)** | |
| Aluminum | Lead |
| Antimony | Magnesium |
| Arsenic | Manganese |
| Barium | Mercury |
| Beryllium | Nickel |
| Cadmium | Potassium |
| Calcium | Selenium |
| Chromium | Silver |
| Cobalt | Sodium |
| Copper | Thallium |
| Cyanide | Vanadium |
| Iron | Zinc |
| **VOLATILE ORGANIC COMPOUNDS** | |
| 1,1,1-Trichloroethane | Carbon Tetrachloride |
| 1,1,2,2-Tetrachloroethane | Chlorobenzene |
| 1,1,2-Trichloroethane | Chloroethane |
| 1,1-Dichloroethane | Chloroform |
| 1,1-Dichloroethene | Chloromethane |
| 1,2-Dichloroethane | Cis-1,3-Dichloropropene |
| 1,2-Dichloroethene (Total) | Dibromochloromethane |
| 1,2-Dichloropropane | Ethybenzene |
| 2-Butanone | Methylene Chloride |
| 2-Hexanone | Styrene |
| 4-Methyl-2-Pentanone | Tetrachloroethene |

**TABLE 1-1**
**SUMMARY OF RI ANALYTICAL PARAMETERS**
**for Ground Water**
**Woolfolk Chemical Works RD/RA**
**Fort Valley, GA**

| VOLATILE ORGANIC COMPOUNDS | |
|---|---|
| Acetone | Toluene |
| Benzene | Trans-1,3-Dichloropropene |
| Bromodichloromethane | Trichloroethene |
| Bromoform | Vinyl Acetate |
| Bromomethane | Vinyl Chloride |
| Carbon Disulfide | Xylene (Total) |
| **SEMIVOLATILE ORGANIC COMPOUNDS** | |
| 1,2,4-Trichlorobenzene | Benzo(GHI)Perylene |
| 1,2-Dichlorobenzene | Benzo(K)Fluoranthene |
| 1,3-Dichlorobenzene | Benzoic Acid |
| 1,4-Dichlorobenzene | Benzyl Alcohol |
| 2,4,5-Trichlorophenol | Benzyl Butyl Phthalate |
| 2,4,6-Trichlorophenol | Bis(2-Chloroethoxy) Methane |
| 2,4-Dichlorophenol | Bis(2-Chloroisopropyl) Ether |
| 2,4-Dimethylphenol | Bis(2-Chloroisopropyl) Ether |
| 2,4-Dinitrophenol | Bis(2-Ethylhexyl)Phthalate |
| 2,4-Dinitrotoluene | Chrysene |
| 2,6-Dinitrotoluene | Di-N-Butyl Phthalate |
| 2-Chloronaphthalene | Di-N-Octyl Phthalate |
| 2-Chlorophenol | Dibenzo(A,H)Anthracene |
| 2-Methylnaphthalene | Dibenzofuran |
| 2-Methylphenol | Diethyl Phthalate |
| 2-Nitroaniline | Dimethyl Phthalate |
| 2-Nitrophenol | Fluoranthene |
| 3,3'-Dichlorobenzidine | Fluorene |
| 3-Nitroaniline | Hexachlorobenzene |
| 4,6-Dinitro-2-Methylphenol | Hexachlorobutadiene |
| 4-Bromophenyl Phenyl Ether | Hexachlorocyclopentadiene |
| 4-Chloro-3-Methylphenol | Hexachloroethane |
| 4-Chloroaniline | Indeno(1,2,3-CD)Pyrene |
| 4-Chlorophenyl Phenyl Ether | Isophorone |
| 4-Methylphenol | N-Nitrosodiphenylamine |
| 4-Nitroaniline | N-Nitrosodipropylamine |
| 4-Nitrophenol | Naphathalene |
| Acenaphthene | Nitrobenzene |
| Acenaphthylene | Pentachlorophenol |
| Anthracene | Phenanthrene |
| Benzo(A)Anthracene | Phenol |
| Benza(A)Pyrene | Pyrene |
| Benzo(B)Fluoranthene | |

# TABLE 1-2
# GROUND WATER SAMPLING SUMMARY
# RI PHASE I AND PHASE II

## Woolfolk Chemical Works RD/RA
## Fort Valley, GA

| Well Number | Phase I or Phase II | Analytical Parameters | | | | | |
|---|---|---|---|---|---|---|---|
| | | VOCs | SVOCs | Pest | TAL Metals | Purgeable Hydrocarbons | CN |
| MW-1 | Water present in well, but yield too low to sample | | | | | | |
| MW-2 | I | x | x | x | x | | x |
| MW-2C | I | x | x | x | x | | x |
| MW-2K | I | x | x | x | x | | x |
| MW-2P | I | x | x | x | x | | x |
| MW-2R | I | x | x | x | x | | x |
| MW-2T | I | x | x | x | x | | x |
| | II | | | | | x | |
| MW-3 | Dry well during both sampling exents | | | | | | |
| MW-3R | I | x | x | x | x | | x |
| MW-4A | Dry well during both sampling events | | | | | | |
| MW-4B | I | x | x | x | x | | x |
| MW-4C | I | x | x | x | x | | x |
| MW-4T | I | x | x | x | x | | x |
| | II | | | | | x | |
| MW-5 | Dry well during both sampling events | | | | | | |
| MW-5P | I | x | x | x | x | | x |
| MW-5T | I | x | x | x | x | | x |
| | II | | | | | x | |
| MW-6 | Dry well during both sampling events | | | | | | |
| MW-6P | 1 | x | x | x | x | | x |

# TABLE 1-2
# GROUND WATER SAMPLING SUMMARY
# RI PHASE I AND PHASE II

## Woolfolk Chemical Works RD/RA
## Fort Valley, GA

| Well Number | Phase I or Phase II | Analytical Parameters | | | | | |
|---|---|---|---|---|---|---|---|
| | | VOCs | SVOCs | Pest | TAL Metals | Purgeable Hydrocarbons | CN |
| MW-7 | I | x | x | x | x | | x |
| MW-7T | I | x | x | x | x | | x |
| | II | | | | | x | |
| MW-8 | I | x | x | x | x | | x |
| MW-9 | I | x | x | x | x | | x |
| MW-10 | I | x | | | | | |
| | II | | x | x | x | | |
| MW-11 | I | x | x | x | x | | x |
| MW-12 | I | x | x | x | x | | x |
| MW-13 | I | x | x | x | x | | x |
| MW-14 | I | x | x | x | x | | x |
| MW-15 | I | x | x | x | x | | |
| MW-16 | I | x | x | x | x | | |
| MW-17 | II | | | | | x | |
| MW-18 | II | | x | x | x | x | x |
| MW-19 | I | x | x | x | x | | x |
| MW-20 | I | (a) | x | x | x | | x |
| MW-21 | I | x | x | x | x | | x |
| MW-22 | Dry well during both sampling events | | | | | | |
| MW-23 | I | x | x | x | x | | x |
| MW-24 | I | x | x | x | (a) | | (a) |
| MW-25 | I | x | x | x | x | | x |

# TABLE 1-2
# GROUND WATER SAMPLING SUMMARY
# RI PHASE I AND PHASE II

## Woolfolk Chemical Works RD/RA
## Fort Valley, GA

| Well Number | Phase I or Phase II | Analytical Parameters | | | | | |
|---|---|---|---|---|---|---|---|
| | | VOCs | SVOCs | Pest | TAL Metals | Purgeable Hydrocarbons | CN |
| MW-26 | I | x | x | x | x | | x |
| | II | | | | | x | |
| MW-27 | II | | (b) | (b) | (b) | x | (b) |
| MW-28 | I | x | x | x | x | | x |
| MW-29 | This well was installed during Phase II, but development problems did not allow timely collection | | | | | | |
| MW-30 | II | | x | x | x | x | x |
| MW-31 | | | x | x | x | x | x |
| MW-32 | II | | x | x | x | x | x |
| MW-33 | II | | x | x | x | x | x |
| MW-34 | II | | x | x | x | x | x |
| MW-35 | II | | x | x | x | x | x |
| City Well No.1-Before Chlorination | II | | x | x | x | x | x |
| City Well No. 2-Before Chlorination | II | | x | x | x | x | x |
| City Wells No. 1 and 2-After Chlorination | II | | x | x | x | x | x |

(a) MW-20 was sampled for VOCs by AES, but analytical results were not reported.

(b) Water present in well, but yield too low for collection of remaining sample fractions.

concentrations were in MW-12 (0.0083 mg/L), MW-13 (0.0035 mg/), and MW-16 (0.0019 mg/L). No pesticides were detected in MW-4C, MW-11, MW-14, and MW-15. Overall, the most elevated concentrations for pesticides were detected in MW-12 and MW-13, followed by MW-16.

***Inorganic Constituents.*** Trace metals were detected in eight of the 11 Surficial Aquifer Wells sampled during the RI. Arsenic was detected ranging from a maximum concentration of 5.92 mg/L in MW-12 to 0.020 mg/L in MW-16. The most elevated concentrations of lead were detected in MW-2 and MW-13, both at 0.023 mg/L. The lowest was 0.0035 mg/L in MW-14. Chromium was detected in six of the wells sampled with concentrations ranging from a high of 0.10 mg/L in MW-12 to 0.017 mg/L in MW-4C. Overall, the most elevated arsenic and chromium concentrations were detected in MW-12 and MW-13 and the highest concentrations of lead were detected in MW-2 and MW-13. Other inorganic constituents detected included mercury (in MW-2, MW-2C, MW-2K, and MW-16), cadmium (in MW-2 and MW-16), and selenium (in MW-11).

***Volatiles.*** The most common volatile organic compound (VOC) detected in the Surfical Aquifer was 1,2-dichloroethane (1,2-DCA). 1,2-DCA was detected in MW-2C, MW-2K, MW-12, MW-13, and MW-16 at concentrations ranging from 0.002 mg/L in MW-2K to 0.200 mg/L in MW-16. In three of the five wells in which 1,2-DCA was detected, 1,2-dichloropropane (1,2-DCP) was also detected. Other VOCs detected included trichloroethylene (TCE) at 0.084 mg/L in MW-13, tetrachloroethylene (PCE) at 0.001 mg/L in MW-4, and toluene at 0.010 mg/L in MW-16. MW-12, MW-13, and MW-16 exhibited the most elevated concentrations of VOCs in this aquifer.

***Semivolatiles.*** Bis(2-ethylhexyl)phthalate and 1,2,4-trichlorobenzene (1,2,4-TCB) were detected in both MW-12 and MW-13. Other semivolatiles detected in

the Surficial Aquifer include benzoic acid (in MW-2C) and pentachlorophenol (in MW-13).

### *1.2.2 Upper Cretaceous Water Table Aquifer*

***Pesticides.*** Pesticides were detected in nine of 17 Upper Cretaceous Water Table Aquifer wells sampled in and around the Site during the RI. The highest levels of pesticides were detected in wells MW-5P and MW-6P in the western part of the Site near Building W and in MW-30 to the southeast of the Site. The same pesticides were detected as in the Surficial Aquifer but in a smaller percentage of wells. The highest concentrations of lindane were detected in MW-5P (0.016 mg/L), MW-6P (0.012 mg/L) and MW-30 (0.014 mg/L); the lowest concentration was detected in MW-25 at 0.00044 mg/L.

***Inorganic Constituents.*** Inorganic constituents were detected in all but three of the 17 wells sampled. Arsenic was detected in three wells: MW-31 at 0.85 mg/L, MW-8 at 0.74 mg/L, and MW-29 at 0.0014 mg/L. Lead was detected in 11 of 17 wells, with the highest levels in MW-7 at 0.040 mg/L and MW-25 at 0.039 mg/L and the lowest in MW-8 at 0.0042 mg/L. Chromium was detected in 12 of 17 wells, with the highest concentrations in MW-25 at 0.15 mg/L and MW-31 at 0.14 mg/L and the lowest in MW-8 at 0.011 mg/L. In general, arsenic levels have remained constant over time at below the detection limit in most wells in this aquifer; an exception is in MW-8 where it has increased.

***Volatiles.*** 1,2-DCA was detected in seven of the wells in this aquifer and was accompanied by 1,2-DCP in three of the wells (MW-23, MW-8, and MW-30). The most elevated concentrations of 1,2-DCP were detected in MW-23 (0.061 mg/L) and MW-30 (0.090 mg/L). Carbon disulfide was detected at concentrations of 0.10 mg/L in MW-25, 0.097 mg/L in MW-9, and 0.003 mg/L in

MW-20. PCE and TCE were detected up to concentrations of 0.005 mg/L in five wells.

***Semivolatiles.*** Bis(2-ethylhexyl)phthalate was the most common semivolatile detected and occurred in 11 of the 17 wells sampled. Concentrations ranged from 0.20 mg/L in MW-2P to 0.006 mg/L in MW-25. 1,2,4-TCB was also detected in two wells, MW-5P and MW-6P.

### *1.2.3 Upper Cretaceous Confined Aquifer*

***Pesticides.*** Pesticides were detected in five of the seven wells sampled in this aquifer. Lindane detected concentration levels ranged from 0.000073 mg/L in MW-35 to 0.0015 mg/L in MW-33. All of the other pesticide detections were at low concentration levels.

***Inorganic Constituents.*** Inorganic constituents were detected in four of the six wells sampled. Arsenic was detected in MW-35 at 0.0056 mg/L, the only detection of arsenic in this aquifer. The highest chromium concentration was detected in MW-35 at 0.36 mg/L and the lowest in MW-33 at 0.042 mg/L. The highest lead value (0.030 mg/L) was detected in MW-3R, and the lowest (0.0053 mg/L) was detected in MW-33.

***Volatiles.*** 1,2-DCA was detected in all wells samples in this aquifer with a maximum concentration of 0.021 mg/L and a minimum of 0.001 mg/L. No 1,2-DCP was detected. PCE was detected at 0.011 mg/L in MW-3R and 0.004 mg/L in MW-2R. Carbon disulfide was also detected in MW-3R at 0.011 mg/L.

***Semivolatiles.*** Bis(2-ethylhexyl)phthalate was the most common semivolatile detected and occurred in six of the wells sampled. Phenol was detected in MW-

24 at 0.020 mg/L.

### *1.2.4 Tuscaloosa Aquifer*

The wells designated as monitoring the Tuscaloosa Aquifer include all those screened in the sequence of sediments designated as the Tuscaloosa Aquifer. The ground water samples collected from the Tuscaloosa Aquifer during the RI fall into two distinct sets of samples: samples from monitoring wells installed in and around the Site in the Tuscaloosa Aquifer, and samples from the City of Fort Valley municipal water supply wells screened in the Tuscaloosa Aquifer.

***Pesticides.*** No pesticides were detected in any of the monitoring wells or city wells sampled in this aquifer.

***Inorganic Constituents.*** No arsenic or chromium was detected in the ground water samples collected from the monitoring wells in this aquifer. Lead was detected at less than 0.006 mg/L in three monitoring wells sampled which is below the 0.015 Mg/L Lead ground water performance standard in the ROD. No inorganic constituents were detected in the samples collected from the city wells.

***Volatiles.*** 1,2-DCA was detected in two of the Tuscaloosa monitoring wells with a maximum concentration of 0.002 mg/L in MW-26 which is below the 0.005 mg/L 1,2-DCA Ground water performance standard in the ROD. No VOCs were detected in the ground water samples from the city wells.

***Semivolatiles.*** No semivolatiles were detected in the ground water samples from the monitoring or city wells in this aquifer.

### *1.2.5 Conclusions on Distribution of Chemicals*

The distribution of chemicals in the ground water is as follows:

- In the Surficial Aquifer, monitoring wells MW-12 and MW-13 exhibit the most elevated levels of pesticides, inorganic constituents, and volatile organic compounds MW-16 also exhibited elevated contaminant concentrations.

- The highest concentrations of pesticides in the Upper Cretaceous Water Table Aquifer are in the vicinity of monitoring wells MW-5P and MW-6P.

- 1,2-DCA occurs in wells in all hydrogeological units along a northwest-southeast trending line. This line is consistent with the flow paths that contaminants would be expected to take traveling through the Surficial and the Upper Cretaceous Water Table Aquifers.

## *1.3 SUMMARY OF PREVIOUS RESPONSES*

In September 1986, soil remediation at the Site was initiated. The major remediation activities consisted of demolishing several buildings and excavating approximately 3,700 cubic yards of soils contaminated with arsenic and lead (soils with a total lead and arsenic level of >10,000 mg/kg). All contaminated soils were disposed of at the permitted hazardous waste landfill in Emelle, Alabama. The Georgia EPD was kept informed of such investigations and cleanup activities. The remediation involved several area of the Site, each of which is discussed briefly below.

- **Area 1**

Lead arsenate and calcium arsenate had been formulated, packaged, and stored in a building located near the northwest portion of the Site referred to as Area 1. The building was disposed of in the permitted hazardous waste landfill i Emelle, Alabama. Soil was excavated below and adjacent to the former building location from 1 to 20 feet below ground surface (BGS). Depending on the nature of the waste, soil was disposed of at permitted hazardous waste landfills or left at the Site and capped. Soil with arsenic of lead concentrations exceeding 10,000 mg/kg was either taken to Emelle, Alabama, or placed below a RCRA-type, multilayer cap installed over Area 1. Concrete debris and lime-sulfur sludge were also placed below the cap.

- **Area 1a**

Area 1a is a small area north of Area 1 between the railroad tracks and the northwest property line. The area was formerly used to stockpile lime-sulfur sludge. This sludge was removed and placed below the cap in Area 1. Soil from the area beneath the sludge that was contaminated with levels of lead and arsenic exceeding 10,000 mg/kg was excavated up to feet BGS. The are was restored to current grade with clean soil.

- **Area 2**

Area 2 is located southeast of Building W along Pine Street. A structure used as an organic pesticide packaging facility (Building P) once stood over a portion of Area 2. A hand-dug well, at least 10 feet deep, was also discovered in this area. Soil having arsenic and lead concentrations

exceeding 10,000 mg/kg in this area was removed to a depth of 1 foot BGS.

- **Area 3**

Area 3 was located northeast of Building N. The remediation of Area 3 consisted of the removal of soil to 1 foot BGS. In addition, a 30-by 30-foot area by the tank farm was excavated to 3 feet BGS. Another hand-dug well, approximately 4 feet square by 16 feet deep, was discovered and filled with neat cement grout.

- **Area 3a**

Area 3a is located on the southwest side of Building S by the loading dock used for shipping. This area was excavated to about 1 foot BGS.

- **Area 4**

Area 4 is within a tank farm currently used by the Site. Soil was removed from 1 to 3 feet BGS.

- **Area 5**

Area 5 is located east of the tank farm and Building S. It is currently used as anorganic pesticide and kaolin unloading area. Soil from this area was removed to 10 foot BGS.

- **Area 6**

  This former drum staging area is located northeast of Building F. Soil was removed from 1 to 2 feet BGS in Area 6.

- **Area H**

  This area, where Building H once stood, was excavated to da depth of 1 foot BGS.

- **Building I Area**

  This area, where Building I once stood, is a small area on the north side of Building J, beside a loading dock. This area was excavated to 1 foot BGS.

- **Building W Area**

  The soil beneath building W was excavated to a depth of 1/2 to 1 foot BGS.

- **Other Actions**

  Other remedial actions taken at the Site included diverting storm water around Building W, sealing the crawlspace of Building E, and the demolition of Building E.

**Federal Removal Actions**

In December 1993, the EPA issued a Unilateral Administrative Order (UAO) for removal activities. The scope of the UAO included:

- "Disassociation of residents" from residential properties,
- excavation/restoration for vacant properties,
- excavation and/or paving of road rights-of-way,
- fencing or fencing repair of commercial/industrial properties,
- removal of sediments and soil from the ditch area, and
- demolition of Building E.

These removal activities began in January 1994 and are expected to be completed by January 1995.

Demolition of Building E was completed in April 1994. Nonhazardous materials from Building E were disposal of at the BFI Hickory Hill. Building materials that contain dioxin were placed in an ISO container that is stored on a curbed concrete slab located immediately northeast of the Area 1 cap. A roof was placed over the container and a chain link fence was constructed around it.

## *1.4 STATEMENT OF THE PROBLEM AND RD/RA STRATEGY*

### *1.4.1 Statement of Problem*

The U.S. EPA issued a Record of Decision (ROD) for Operable Unit No. 1 at this site on March 25, 1994. The ROD specifies the remedy for Operable Unit No. 1 which is as follows:

1. "Further delineation of the extent and extraction of contaminated ground water from the surficial, Upper Cretaceous (U) Water Table, and UC Confined Aquifers.

2. Treatment of the ground water using iron co-precipitation and sand filtration with activated carbon adsorption as polishing steps, if needed.

3. Discharge to a Publicly-Owned Water Treatment Works (POTW) with a contingency plan to include a National Pollutant Discharge Elimination System (NPDES) permit for surface water discharge or possibly an infiltration gallery should an NPDES permit be unattainable.

4. Institutional Controls, such as deed restrictions limiting the use of ground water at the site until performance goals are met.

5. Ground water monitoring of specific wells, including the city wells, to be further defined during Remedial Design/Remedial Action (RD/RA) and abandonment of all other monitoring wells used during the RI/FS.

6. Operation and Maintenance of the full system to be defined by an O&M Plan developed during the Remedial Design".

In addition, drainage control associated with the ground water extraction and treatment systems will be developed.

The problem posed by Operable Unit No. 1 at this site is that metals and organic chemicals are present in the ground water at concentrations that exceed ground water performance standards specified in the ROD. A summary of these standards is presented in Table 1-3. Section 1.2 of this Work Plan summarizes

## TABLE 1-3
## GROUND WATER PERFORMANCE STANDARDS

### Woolfolk Chemical Works Site

| Parameter | Standard[1] μg/L | Parameter | Standard[1] μg/L |
|---|---|---|---|
| **Inorganic** | | **Semi-Volatile Organic Compound** | |
| Arsenic | 50 | bis(2-ethylhexyl)phthalate• | 6 |
| Cadmium | 5 | **Volatile Organic Compounds** | |
| Chromium | 100 | Acetone• | 4000[3] |
| Lead• | 15[2] | Chloroform• | 3 |
| Manganese• | 200[3] | Carbon Disulfide• | 300[3] |
| **Pesticides** | | 1,2-Dichloroethane | 5 |
| alpha-BHC• | 0.01 | 1,2-Dichloropropane | 5 |
| beta-BHC• | 0.05 | Tetrachloroethene• | 5 |
| delta-BHA• | 0.01[4] | | |
| gamma-BHC• | 0.2 | | |
| Dieldrin• | 0.005 | | |

Notes:

1 The COCs in this column are cancer-causing substances unless otherwise noted. The risk-based concentrations represent a $10^6$ risk level (or an increased chance of one additional case of cancer in one million people). Exception: The risk level for arsenic at the MCL level is $2.5 \times 10^3$.

2 EPA standard from Lead and Copper Rule, 56 FR, June 7, 1991.

3 This chemical is a non-cancer causing substance. The performance standard is based on a concentration which is not likely to produce harmful health effects (HQ=1).

4 The health/risk-based number is based on the toxicity of alpha-BHC.

• Performance standard is risk-based in absence of MCLs.

historic ground water concentrations. Another aspect of the problem is that the extent of the ground water contamination has not been fully delineated.

### *1.4.2 Work Plan Objectives*

#### *1.4.2.1 Technical Objectives*

Technical objectives are to prepare a design that, when implemented, will:

1. limit further degradation of the Upper Cretaceous Aquifer by contaminant concentrations exceeding performance standards that are defined in the ROD, and remediate off-Site contamination in this aquifer originating from the Site;

2. limit downward migration of contaminants from contacting the Tuscaloosa Aquifer in concentrations exceeding performance standards that are defined in the ROD;

3. limit further degradation of the Surficial Aquifer by contaminant concentrations exceeding performance standards that are defined in the ROD, and at the site boundary; and

4. limit further degradation of the Upper Cretaceous Water Table Aquifer by contaminants exceeding performance standards that are defined in the ROD, and remediate off-Site contamination in this aquifer originating from the Site.

#### *1.4.2.2 Administrative Objectives*

The administrative objectives are to satisfy the administrative requirements

specified in the UAO and ROD. These objectives consist of those planning, design, and submittal tasks which are summarized in Table 1-4.

### *1.4.3 RD/RA Strategy*

It is proposed to use the full-scale treatment system of approximately 20 gpm to satisfy the requirement for field-scale pilot testing. It is proposed to expedite remediation by designing the full-scale extraction and treatment systems before further delineation of the extent of the ground water contamination occurs.

It is believed that this strategy offers advantages over the traditional alternative wherein the contamination would be more fully delineated before design work begins. Specifically the proposed strategy will shorten the overall length of time required to begin ground water remediation. The time typically required to conduct extensive aquifer tests will also be shortened in the proposed strategy.

The reasons that the proposed strategy will work are as follows:

1. Known ground water contamination will be remediated sooner.

2. Ground water modeling conducted during the FS suggests that 57 extraction wells will be required to remediate the ground water contamination as currently defined. Ground water recovered by, 39 of these wells will require treatment.

3. Given the above, the ground water extraction and treatment systems that may be required for remediation of addition ground water contamination will not likely increase in size by a large percentage over that currently specified in the ROD.

# TABLE 1-4
# WORK PLAN AND REPORT REQUIREMENTS

## Woolfolk Chemical Works RD/RA

| ITEM | CONTENT TO ADDRESS |
|---|---|
| Remedial Design Work Plan | Submit with Word Perfect 5.1 disk<br>Field Sampling and Analysis Plan<br>Quality Assurance Project Plan<br>Health and Safety Plan<br>Treatability Study Work Plan<br>**Preliminary Design Submittal, 30%**<br>Results of Data Acquisition Activities<br>Design Criteria Report<br>Preliminary Plans and Specifications, Outline Form<br>Plan for satisfying permit requirements<br>Vendor treatability study final report *<br>**Intermediate Design Submittal, 60%**<br>Draft Design Analyses<br>Draft Plans and Specifications<br>Draft Construction Schedule<br>Performance Standards Verification Plan (Ground Water)<br>Value Engineering Proposals<br>**Prefinal (90%) and Final (100%) Design Submittal**<br>Complete Design Analyses<br>Final Plans and Specifications<br>Final Construction Schedule<br>Construction Cost Estimate<br>Operation and Maintenance Plan<br>Operation and Maintenance Manual<br>Schedule for Completion of Remedial Action Work Plan |
| Remedial Action Work Plan | Submit Concurrent with Prefinal/Final Design<br>Construction Health and Safety/Contingency Plan<br>Final Schedule for Completion of the Remedial Action<br>Schedule for Submitting Other Remedial Action Plans<br>Project Delivery Strategy<br>Construction Management Plan<br>Construction Quality Assurance Plan |
| Remedial Action | Preconstruction Conference<br>Prefinal Construction Inspection<br>Final Construction Inspection<br>Final Construction Report<br>Field Scale Treatability Study Report*<br>Revised Sampling and Analysis Plan (Ground Water Delineation) *<br>System Modification Plan (as needed) *<br>Remedial Action Report |

* **Modified from UAO Statement of Work (Appendix 2)**

4. Interim operation of a full-scale extraction and treatment system will provide far superior predictive results of system performance when compared to a shorter term field-scale treatability study and aquifer testing program.

5. Observation of ground water quality and elevation data changes during full-scale extraction will provide a much better understanding of the flow system so that additional delineation studies can be more focused.

In the proposed strategy, limited aquifer testing will be conducted in order to confirm projected flows from the system and in order to collect representative samples of ground water for treatability testing by equipment vendors. The treatment system size will be fixed early after aquifer tests. The treatment system will be designed for easy expansion if needed by providing features that will facilitate such expansion. For example, piping from recovery wells to the treatment system will be oversized in those areas where the extent of the plume has not been fully defined. Connections will be provided to ease future hookup of additional wells in these instances.

During the preliminary engineering phase, the size of the treatment system will be examined and a recommendation for preliminary sizing of equipment will be made that will accommodate the extraction wells specified in the FS (i.e., 20 GPM) plus a reasonable allowance for additional flow to accommodate additional extraction wells that may be required after the ground water plume is delineated. The preliminary engineering phase will start using these numbers. Since the treatment system will be oversized, operation of the full scale system will provide additional data on aquifer parameters. The critical element in proceeding in this fashion is selection of recovery pumps. Since electric submersible pumps are not

available for low flows, i.e. below 1 GPM, pneumatic displacement pumps will be used. Aquifer tests proposed in Section 2.1.1 will provide information on specific capacity of the proposed recovery wells and will confirm hydraulic conductivity derived from slug tests conducted during the RI/FS.

## *1.5 WORK PLAN ORGANIZATION*

This Work Plan includes technical discussions of those tasks required to execute the RD as specified in Appendix 2 of the UAO. This Work Plan includes the following:

Section 1 - Statement of the Problem, Background Summary, Site History, Description of Previous Responses, and Data Summary

Section 2 - Technical Scope of Work describing those tasks to be performed in the RD including the Treatability Study

Section 3 - Schedule for execution of the RD

Section 4 - Project Management Plan

Section 5 - Community Relations Support

Appendices:

A. Field Sampling and Analysis Plan (FSAP)

B. Treatability Study Work Plan

C. Quality Assurance Project Plan (QAPP)

D. Health and Safety Plan for the RD

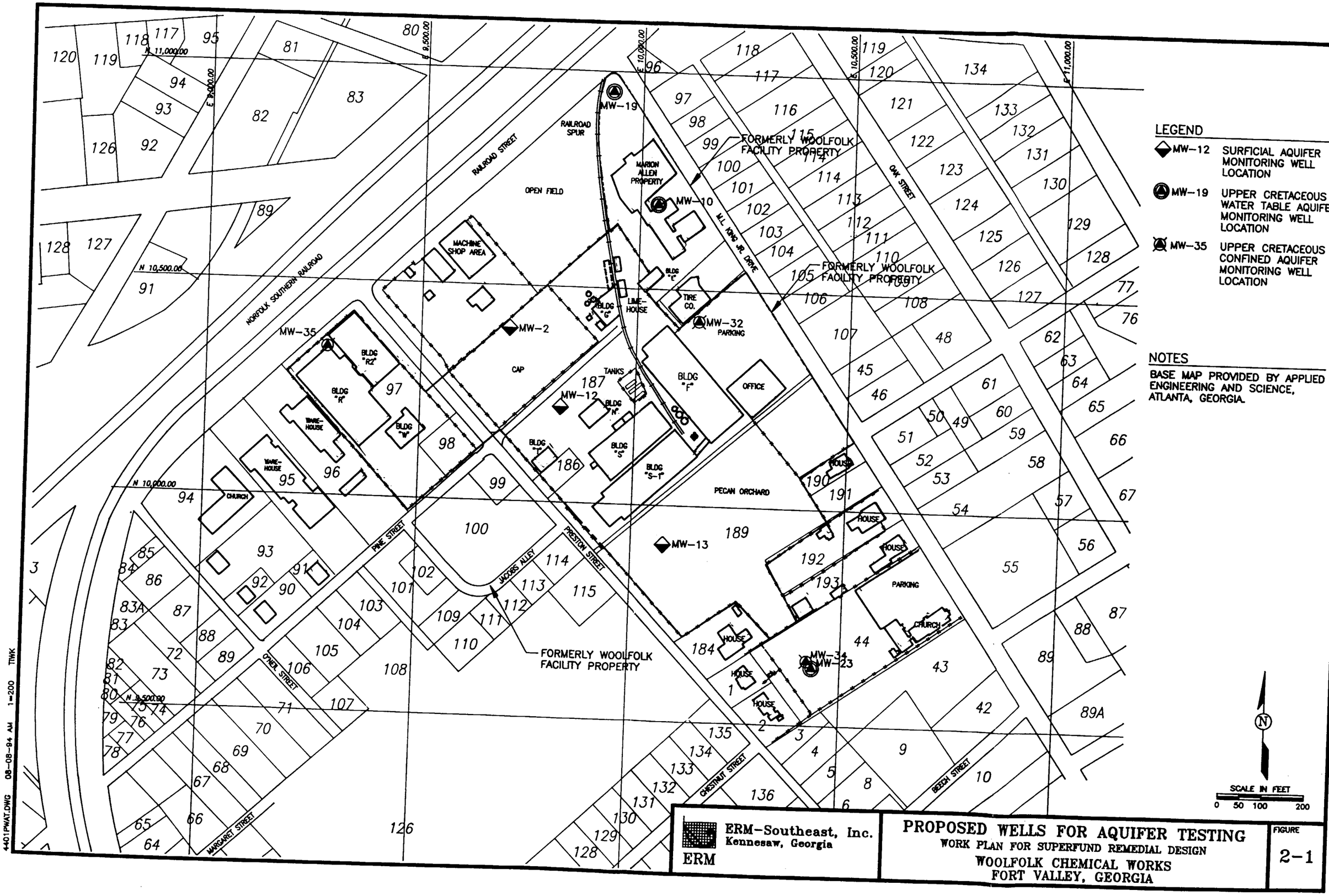
## 2.0 *TECHNICAL SCOPE OF WORK*

## 2.1 *PREDESIGN INVESTIGATIONS*

### 2.1.1 *Aquifer Testing*

A review of documents associated with the RI indicate that aquifer tests at the Site were based primarily to instantaneous injection or withdrawal (i.e. slug) tests. Data from these tests were used to estimate the hydraulic conductivity of the Surficial Aquifer, the Upper Cretaceous Water Table Aquifer, and the Upper Cretaceous Confined Aquifer. These estimates were used as part of the modeling effort associated with the FS. Based on the results of the modeling, it has been predicted that ground water withdrawal rates from the Surficial Aquifer and Upper Cretaceous Water Table Aquifer recovery wells will be 0.3 and 0.2 GPM, respectively. The estimated withdrawal rate from each of the Upper Cretaceous Confined Aquifer wells is 2 GPM.

In order to verify ground water withdrawal rates (i.e. pumping rates) predicted by the modeling, short-term (i.e. four hours or less) aquifer tests will be conducted at three Surficial Aquifer monitoring wells, three Upper Cretaceous Water Table Aquifer monitoring wells, and three Upper Cretaceous Confined Aquifer Monitoring wells. These tests will be conducted using small-diameter electric submersible pumps or pneumatic pumps, depending on the yield of each well. During the tests, the pumping rate at each well will be increased incrementally until an estimate of its maximum sustainable yield can be made. Discharge from each well will be contained in 55 gallon drums or in other suitable containers. The locations of the monitoring wells at which these tests are to be conducted are shown on Figure 2-1. Their locations have been selected because they are in proximity to the locations of recovery wells as proposed in the Feasibility Study (FS).




ERM-Southeast, Inc.
Kennesaw, Georgia
ERM

**PROPOSED WELLS FOR AQUIFER TESTING**
WORK PLAN FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 2-1

4401PWAT.DWG 08-08-94 AM 1=200 TIWK

when the tensiometer readings approach a matrix potential of zero. At this point, the basins will be topped off with potable water and measurements of water intake versus time will be recorded until steady state conditions have been achieved. The data will be plotted on log-log paper and a best fit line will be used to calculate the soil's percolation rate.

### *2.1.4 Predesign Report*

At the conclusion of the predesign activities, a report will be prepared that will document the investigations. This report will be used by the design team in preparing the remedial design. This report will be submitted to the U.S. EPA with the Preliminary Design Report.

## *2.2 ENGINEERING DESIGN*

### *2.2.1 Design Phases*

The Remedial Design Schedule will include the preparation and submission of Remedial Design reports and associated items at the various stages of completion required per the SOW. These include the following points of progress:

| Submittal | Stage of Completion |
|---|---|
| Preliminary Design Report | 30% |
| Intermediate Design Report | 60% |
| Pre-Final Design Report | 90% |
| Final Design Report | 100% |

As with most Remedial Designs, there are predesign investigations to be

completed to more clearly define the basis for design. The proposed approach will be to prepare deliverables documenting the investigations that are completed and to present, as clearly and completely as possible at that time, the criteria to be used for completing each element of the remedy. It is important at the 30% stage to identify design criteria, access and other approval requirements, and the environmental permits that will be required to the greatest extent possible, in order to gain the agreement of the EPA, GA EPD, and local authorities in these regards. Accomplishing this agreement and the clear understanding of agency expectations is critical to avoiding rework in later stages of the Remedial Design.

### *2.2.2 Preliminary (30%) Design*

The preliminary design will involve several steps, the most important of which includes the predesign investigations and reports. These activities and the accompanying documents set the stage for the remaining work. Upon approval by the EPA, the Remedial Design will be performed in conformance with the Work Plan, with strict attention to the Remedial Design Schedule.

Design criteria will be defined in a report which includes or references the other deliverables required at the 30% completion stage. These include the following submittals as specified in the Scope of Work (Appendix 2) of the UAO:

1. Results of Data Acquisition Activities

   Data gathered during the project planning phase will be completed, summarized, and submitted along with an analysis of the impact of the results on design activities. In addition, surveys conducted to establish topography, rights-of-way, easements, and utility lines will be documented. Utility requirements and acquisition of access, through

purchases or easements, that are necessary to implement the RA will also be discussed.

2. Design Criteria Report

The concepts supporting the technical aspects of the design will be defined in detail and presented in the report. Specifically, the Design Criteria Report will include the preliminary design assumptions and parameters, including:

a. Waste characterization
b. Pretreatment requirements
c. Volume of each medium requiring treatment
d. Treatment schemes (including all media and by-products)
e. Input/output rates
f. Influent and effluent qualities
g. Materials and equipment
h. Performance standards
i. Long-term monitoring requirements

3. Preliminary Plans and Specifications

An outline of the required drawings will be submitted, including preliminary sketches and layouts, describing conceptual aspects of the design, unit processes, etc. In addition, an outline of the required specifications, including performance standards, will submitted.

4. Plan for Satisfying Permitting Requirements

All activities must be performed in accordance with the requirements of all applicable federal and state laws and regulations. Any off-site disposal will be in compliance with the policies stated in the Procedure for Planning and Implementing Off-site Response Actions (Federal Register, Volume 50, Number 214, November, 1985, pages 45933 - 45937) and Federal Register, Volume 55, Number 46, March 8, 1990, page 8840, and the National Contingency Plan, Section 300.440. The Permitting Plan will identify the off-site disposal/discharge permits that are required, the time required to process the permit applications, and a schedule for submittal of the permit applications.

5. Vendor Treatability Study Final Report

Following completion of this study, a report will be prepared on the performance of the technology. The study results will indicate clearly the performance of the technology or vendor compared with the performance standards established for the Site. The report will provide an evaluation of the treatment technology's effectiveness, implementablility, cost, and actual results as compared with predicted results. The report will also include an evaluation of the full-scale application of the technology, including a sensitivity analysis identifying the key parameters likely to affect full-scale operations.

### *2.2.3 Intermediate (60%) Design*

The Intermediate Design Report will expand on the work presented in the Preliminary Design Report to represent approximately 60% completion of the

Remedial Design. As appropriate, EPA's comments on the Preliminary Design Report will be addressed in the Intermediate Design Report.

The Intermediate Design deliverables will include further progress on the list of required deliverables specified. The Intermediate Design Report will be submitted in accordance with the schedule set forth in this Remedial Design Work Plan.

As specified in Appendix 2 of the UAO, the following items will be submitted with the Intermediate Design:

1. Draft Design Analyses

   The evaluations conducted to select the design approach will be described. Design calculations will be included.

2. Draft Plans and Specifications

   Draft construction drawings and specifications for all components of the Remedial Action will be prepared and presented. All plans and specifications will conform with the Construction Specifications Institute Master Format. Tables 2-1 and 2-2 show a preliminary list of plans and specifications.

3. Draft Construction Schedule

   A draft construction schedule will be developed for construction and implementation of the remedial action which identifies timing for initiation and completion of all critical path tasks. Dates for completion of the project and major milestones will be identified.

# TABLE 2-1
# PRELIMINARY DRAWING LIST

## Woolfolk Chemical Works

| |
|---|
| Title Page and Drawing Index |
| Legends and Symbols |
| Process Flow Diagram |
| Piping and Instrumentation Diagram |
| Site Plan |
| Site Work/Drainage Controls |
| Drainage Details |
| Foundation |
| Building Plan and Sections |
| Treatment Plant Layout |
| Treatment Plant Piping |
| Treatment Plant Details |
| Well Collection Systems |
| Electrical Site Plan |
| Single Line Diagram |
| Building Power, Lighting and HVAC |

# TABLE 2-2
# PRELIMINARY SPECIFICATION LIST

## Woolfolk Chemical Work

| | |
|---|---|
| 01010 | Scope of Work |
| 02110 | Site Work |
| 02222 | Excavation and Backfill |
| 02830 | Chain Link Fencing and Gates |
| 03100 | Concrete Formwork |
| 03200 | Concrete Reinforcement |
| 03300 | Cast-in-Place Concrete |
| 05100 | Prefabricated Metal Building |
| 15010 | General Provisions for Mechanical Work |
| 15170 | Electric Motors |
| 15510 | Piping |
| 15545 | Chemical Feed Systems |
| 15600 | Extraction Well Pumps |
| 15601 | Metals Removal Package Plant |
| 15604 | Shop Fabricated Tanks |
| 15605 | Agitators |
| 15606 | Centrifugal Pumps |
| 15608 | Metering Pumps |
| 15612 | Instrument Air Package |
| 15920 | HVAC Equipment |
| 16010 | Basic Electrical Requirements |
| 16110 | Conduit, Wire and Cable |
| 16470 | Panelboards |
| 16480 | Motor Control Center |
| 16520 | Lighting Fixtures |
| 16851 | Heating Tracing and Insulation |

4. Performance Standards Verification Plan

The purpose of the Performance Standards Verification Plan is to provide a mechanism to ensure that both short-term and long-term performance standards from the Remedial Design phase will be used. The plan will identify the Site wells and the City wells to be monitored quarterly to determine the effectiveness of the remedy. Abandonment plans will be developed for monitoring wells not needed for Performance Standards Verification. The Performance Standards Verification Plan will include:

a. The Performance Standards Verification Field Sampling and Analysis Plan that will provide guidance for all fieldwork by defining in detail the sampling and data gathering methods to be used. The Performance Standards Verification Field Sampling and Analysis Plan will be written so that a field sampling team unfamiliar with the Site would be able to gather the samples and field information required.

b. The Performance Standards Verification Quality Assurance/Quality Control Plan that describes the quality assurance and quality control protocols which will be followed in demonstrating compliance with performance standards.

c. Specification of those tasks to be performed by Respondents to demonstrate compliance with the performance standards and a schedule for the performance of these tasks.

5. Value Engineering Proposals

Areas that may provide cost savings while achieving RD/RA objectives and meeting RA performance goals will be examined and submitted with the Intermediate Design.

### *2.2.4 Pre-Final (90%) Design*

The Pre-Final Design is a submission of the final design documents to the EPA for its final round of comments. Preparation of the Pre-Final Design will proceed immediately following receipt of EPA's review comments on the Intermediate Design. As appropriate, EPA's comments on the Intermediate Design Report will be addressed in the Pre-Final Design Report. The Pre-Final Design Report will expand on the work presented in the Intermediate Design Report and will essentially represent the Final Remedial Design (i.e., from the perspective of the design team, the design will be 100% complete).

In addition to the completed versions of the Remedial Design drawings, specifications, plans, and reports submitted with the Intermediate Design, the Pre-Final Design deliverables will also include, at a minimum, the following six components:

6. Complete Design Analyses

The selected design will be presented along with an analysis supporting the design approach. Design calculations will be included.

7. Final Plans and Specifications

A complete set of construction drawings and specifications will be submitted which describes the selected design.

8. Final Construction Schedule

Respondents will submit a final construction schedule to EPA for approval.

9. Construction Cost Estimate

An estimate within + 15 percent to -10 percent of actual construction costs will be submitted.

10. Operation and Maintenance Plan

This plan will describe start-up procedures, operation, troubleshooting, training, and evaluation activities that will be carried out by Respondents. The plan will address the following elements:

a. Equipment start-up and operator training;

(i) Technical specifications governing treatment systems;

(ii) Requirements for providing appropriate service visits by experienced personnel to supervise the installation, adjustment, start-up and operation of the systems; and,

(iii) Schedule for training personnel regarding appropriate operational procedures once start-up has been successfully completed.

b. Description of normal operation and maintenance;

(i) Description of tasks required for system operation;

(ii) Description of tasks required for system maintenance;

(iii) Description of prescribed treatment or operating conditions; and

(iv) Schedule showing the required frequency for each O&M task.

c. Description of potential operation problems;

(i) Description and analysis of potential operating problems;

(ii) Sources of information regarding problems; and

(iii) Common remedies or anticipated corrective actions.

d. Description of routine monitoring and laboratory testing;

(i) Description of monitoring tasks;

(ii) Description of required laboratory tests and their interpretation;

(iii) Required QA/QC; and

(iv) Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

e. Description of alternate O&M;

(i) Should system fail, alternate procedures to prevent undue hazards; and

(ii) Analysis of vulnerability and additional resource requirements should a failure occur.

f. Safety Plan;

(i) Description of precautions to be taken and required health and safety equipment, etc., for site personnel protection; and

(ii) Safety tasks required in the event of systems failure.

g. Description of equipment;

(i) Equipment identification;

(ii) Installation of monitoring components;

(iii) Maintenance of site equipment; and

(iv) Replacement schedule for equipment and installation components.

h. Records and reporting;

(i) Daily operating logs;

(ii) Laboratory records;

(iii) Records of operating cost;

(iv) Mechanism for reporting emergencies;

(v) Personnel and maintenance records; and

(vi) Monthly reports to State/Federal Agencies.

11. Operation and Maintenance Manual

This manual will include all necessary O&M information for the operating personnel, including ground water monitoring.

The Pre-Final Design Report will be submitted in accordance with the schedule set forth in this Remedial Design Work Plan.

### 2.2.5 *Final (100%) Design*

The Final Design submission will incorporate, as appropriate, all comments and issues from EPA's review of the Pre-Final Design.

## 2.3 *MONITORING WELL ABANDONMENT*

Based on current information, six existing ground water monitoring wells will be abandoned. The locations of these are shown on Figure 2-3. With the exception of well MW-25, all wells to be abandoned are constructed of PVC materials. Wells MW-8 and MW-25 are completed into the Upper Cretaceous Water Table Aquifer. The remainder are completed in the Surficial Aquifer. Additional monitoring wells may be abandoned as part of the Performance Standards Verification Plan.

As part of the abandonment process, each of these wells will be over-drilled to depth, using large-diameter hollow-stem-augers. At the completion of the drilling the augers will be removed from the boring, and the well casing will be pulled from the hole. Following the removal of the casing, the borehole will be re-drilled to ensure that it is open and stable. Hollow-stem-auger will be the preferred method of drilling. If necessary, however, mud-rotary drilling methods will be employed. Once the hole is clean and stable it will be filled with a cement-bentonite mixture placed using the tremmie method. Details concerning the grout mixture are presented in Appendix A. After a period of at least 24 hours, each borehole will be checked for evidence of subsidence. If necessary, additional grout will be added to ensure they are filled flush with the land surface.

During each test, draw-down in the well being pumped will be monitored by an electronic data logger equipped with a pressure transducer. In addition, the water levels in nearby monitoring wells will be monitored with an electric water level probe as described in Appendix A. At the end of each test, recovery data will be collected. Data from the tests will be evaluated to estimate each well's specific capacity. These estimates, in turn, will be used to predict the cumulative ground water withdrawal rate from each of the three aquifers. In addition, it is expected that estimates of each aquifer's transmissivity can be made from the drawdown and recovery data. These estimates will be compared to the estimates used to model the proposed recovery system.

Following the completion of the aquifer tests, instantaneous injection tests will be conducted at those wells where the static water level in the well is located above its sand pack. At these wells, water obtained during the aquifer test will be quickly transferred back into the well in an attempt to fill the well's casing. In essence, the water will act as the slug. After introducing the water into the well, the rate at which the water level returns to its static position will be monitored and recorded with a data logger and pressure transducer. The resulting data will be analyzed in accordance with the methods of Bouwer and Rice (1976) and Bouwer (1989) to calculate the hydraulic conductivity of the aquifer near the wells where the tests were conducted. Again, these estimates will be compared to those used in the modeling. Water obtained from wells not included in the instantaneous injection testing will also be returned to the well from which it came.

It is planned that a sufficient number of tests will be conducted so that most of the water collected during the aquifer test is returned to the wells. Considering the low pumping rates expected, particularly for the Surficial Aquifer and Upper Cretaceous Water Table Aquifer, it is presumed that this will be feasible.

### *2.1.2 Treatability Studies*

#### *2.1.2.1 Overview of ROD Remedy*

The ROD for the site includes ground water pumping, treatment of a portion of the ground water for the removal of arsenic, and discharge to the city of Fort Valley POTW. Surficial Aquifer and Upper Cretaceous Water Table Aquifer ground water would be treated and discharged to the POTW. Upper Cretaceous and Confined Aquifer ground water would not require treatment prior to its discharge to the POTW. If discharge to the POTW is determined to be infeasible during further investigatory work, direct discharge to surface water or ground water would be required. In this situation, ground water treatment requirements may be revised. Granular activated carbon treatment and/or additional operations may be added to the "base" treatment system described by the ROD.

The ground water treatment system specified in the ROD uses iron coprecipitation for the precipitation and subsequent removal of arsenic within an iron floc matrix. As specified in the FS, ground water first enters an equalization tank. From the equalization tank, water is pumped to a mixing tank where the pH is adjusted and ferric sulfate is added. From the mixing tank, the ground water gravity flows to the clarifier/thickener. Polymer is added in-line to the ground water prior to its entry into the clarifier/thickener. In the clarifier/thickener, solids are settled out of solution and the sludge is thickened. Clarified ground water is pumped through a backwash filter, pH neutralized in a final pH adjustment tank, and discharged with the untreated Upper Cretaceous Confined Aquifer ground water to the POTW. A portion of the clarifier underflow is recycled to the mixing tank; the remaining clarifier underflow is filtered in a plate-and-frame filter press. The solids are sent off site for disposal.

### 2.1.2.2 *Overview of Previous Coprecipitation Treatability Studies*

In 1993, treatability studies were performed on ground water containing 1,960 $\mu$g/L arsenic (unfiltered) and 120 $\mu$g/L arsenic (filtered). In Volume 3 of the Feasibility Study Report (Treatability Study Report), an arsenic discharge requirement of 30 $\mu$g/L is cited based on a state-approved detection limit.

During treatability studies, the following studies were performed:

- Ground water samples were pH adjusted to 6.0 using caustic. Various doses (0, 10, 20, 50, and 100 mg/L) of ferric sulfate and 1 mg/L anionic polymer were added. The ground water was then filtered using a 0.45 $\mu$ filter paper. The filtered ground water was then pH adjusted to 9.7 or 11.0 using caustic. The same dosages of ferric sulfate and 1 mg/L anionic polymer were then added. The ground water was again filtered using a 0.45 $\mu$ filter paper. Arsenic concentrations were 7 mg/L or lower for all of the samples, including the sample with 0 mg/L ferric sulfate. For the sample not treated with ferric sulfate, it is believed that iron already present in the ground water allowed for the coprecipitation of arsenic. [Note that iron was detected in the ground water at 5 mg/L (unfiltered) and <0.03 mg/L (filtered).]

- Ground water samples were adjusted to pHs of 10, 10.5, 11, and 12 using lime. Anionic polmer was added to each of the samples at a concentration of 1 mg/L. The samples were then filtered using 0.45 $\mu$ filter paper. Arsenic did not appear to precipitate in the samples except in the sample that was adjusted to a pH of 12, which had a residual arsenic concentration of 12 $\mu$g/L. It is hypothesized that the high pH allowed for the conversion of As III to As V, which is more readily precipitated. The pH of 12 is considered to be the optimum pH for arsenic removal via lime addition.

Based on a review of the treatability study report, the following design questions remain:

- Based on the presence of naturally-occurring iron in the ground water, is ferric sulfate addition necessary?

- Using a one-stage precipitation process (i.e., reaction would be conducted at one pH only), what is the optimum pH for arsenic coprecipitation and to what extent will arsenic coprecipitate?

- What type of solids separation equipment is necessary to remove solids to meet a limit of 30 $\mu$g/L of arsenic since the previous treatability study used 0.45 $\mu$ filtration?

- What type of base (i.e., lime or caustic) should be used for pH adjustment?

- Considering the small size of the treatment system and the ground water chemistry, is it possible to simplify the system, e.g., by eliminating the mix tank?

The strategy in addressing these issues is presented in the following section.

#### *2.1.2.3 Approach to RD Treatability Studies for this Site*

The size of the full-scale treatment system is expected to be relatively small (20 GPM). Typical pilot-scale units are of the size which can treat the full-scale flow from this Site. Therefore, pilot-scale studies are not recommended. In lieu of the pilot-scale studies, the operation of the full-scale system will be optimized during

the start-up operations. In addition, since ground water characteristics often change in cleanup situations, revisions to and optimization of the treatment system can be expected. The small-scale of the treatment system allows the extrapolation from bench-scale results to "full-scale" with lower risk for this application.

Extensive treatability studies performed in 1993 indicate that arsenic can be effectively precipitated from the ground water using coprecipitation or high pH precipitation techniques. The ROD specifies coprecipitation. In order to evaluate this technology during the RD, treatability studies will be conducted by equipment vendors under the surveillance of the RD contractor. As part of this program, vendors will be provided with representative samples of the ground water for their testing. This will enable them to provide a performance guarantee that their equipment will meet discharge criteria for the treated water. Use of more than one vendor will provide some measure of cost competition and should lower the engineering cost of the project since system vendors frequently provide treatability studies and vendor engineering at modest costs.

Several variants of the treatment process will be investigated by providing vendors of different types of systems representative samples. Each vendor will be requested to provide quotations with a performance that they will be asked to provide will include treatment system utility requirements, preliminary system layouts, operating labor requirements, recommended spare parts, and system chemical usage. When the vendor quotations are received, they will be evaluated to determine which proposal appears to have the greatest flexibility for system expansion, lowest operating criteria.

The approach to treatability studies just described will be followed for the following alternatives:

- ***Coprecipitation Alternatives:*** These alternatives will include the Andco electrochemical coprecipitation process and the Unical Unipure® coprecipitation process. The Andco electrochemical coprecipitation process uses electrochemical cells that contain iron electrodes which dissolve into solution, allowing coprecipitation of heavy metals with ferric hydroxide at a pH between 6 to 9. The Andco process is similar to the ROD alternative except that the electrochemical cells would replace the mix tank. The Unipure® process is similar to the ROD alternative except that the Unipure® reactor would replace the mix tank. Either of these proprietary processes may result in lower chemical use and thus a lower sludge generation rate.

- ***Microfiltration (or Ditomaceous Earth Precoat Filtration) Alternative:*** This alternative includes precipitation of solids in a mix tank and removal of solids using a microfilter (or ditomaceous earth precoat filter) instead of a clarifier and sand filter. A filter press would be needed for dewatering solids from the selected filtration device. Caustic would most likely be the preferred pH adjustment chemical as compared to lime to reduce the solids loading to the microfilter. Ferric sulfate may not be used. This technique may result in a more easily operated system, lower capital costs, and/or reduced operating costs (based on less chemical usage and a lower sludge generation rate). Since it may not be possible to replace the clarifier and sand filter with a microfilter, vendors selected to propose on this alternative will also be asked to quote on the ROD alternative.

### *2.1.3 Treated Ground Water Disposal Options*

#### *2.1.3.1 POTW Discharge*

While preliminary discussions with agency and Fort Valley Utilities Commission officials have been supportive, there are uncertainties in the project which will require resolution with Fort Valley Utilities Commission officials prior to approval of a POTW discharge permit. One uncertainty is the hydraulic loading. The Feasibility Study specifies that 20 GPM of treated water and 40 GPM of untreated water will require disposal. A review of ground water modeling in the FS (Appendix F) shows the following regarding extraction and treatment from each of the three aquifers:

| Aquifer | Number of Extraction Wells[1] | GPM Per Well | Total Flow from all Wells, GPM[2] | Specified Flow, GPM | Treatment Required? |
|---|---|---|---|---|---|
| Surficial | 24 | 0.3 | 7 | 20 | Yes |
| Upper Cretaceous WT | 15 | 0.2 | 3 | | Yes |
| Upper Cretaceous Confined | 18 | (2) | 42 | 40 | No |

1. This includes monitoring wells MW-16 in the Surficial and MW-30 in the Upper Cretaceous.
2. Different flow rates from various wells in this aquifer were used in the modeling.

The flow rate for treatment of 20 gpm was specified to be 10 gpm higher than the modeled extraction rates from the upper two aquifers. The difference is based on infiltration into the Surficial Aquifer which was not accounted for in the modeling. Since slug tests generally provide an estimate of the hydraulic conductivity that is different than the actual conductivity, it is likely that the quantity of ground water requiring disposal will be different than that anticipated in the FS. The hydraulic conductivity from slug tests can be higher or lower than

the actual hydraulic conductivity depending on the lithology and test well sand pack. With Fort Valley being a relatively small community, it will be important to verify that the POTW can accommodate the hydraulic loading.

In this task, discussions will be held with officials of the Fort Valley Utilities Commission and the Georgia EPD in order to learn early in the process the limitations that these two parties intend to place on discharge of treated and untreated ground water to the Fort Valley POTW.

*2.1.3.2 Contingency Discharge Alternatives*

***NPDES Discharge***

Direct discharge of treated ground water from hazardous waste sites through an NPDES discharge permit is often discouraged and, it is anticipated that an NPDES permit will only be granted if discharge to the POTW is not allowed. While early discussions will be held with Fort Valley Utilities Commission officials on discharge to the POTW, there is a possibility that, when a POTW discharge permit application is filed, Commission officials may reverse earlier feelings about the project. For this reason, it is proposed that early discussions and preparation of a permit application for an NPDES permit be part of the RD program. As stated earlier, NPDES discharge requirements may be sufficiently different from POTW discharge standards that reexamination of the proposed treatment process would be required. This approach will allow early determination of NPDES discharge limitations which will enable analysis of possible changes to treatment equipment.

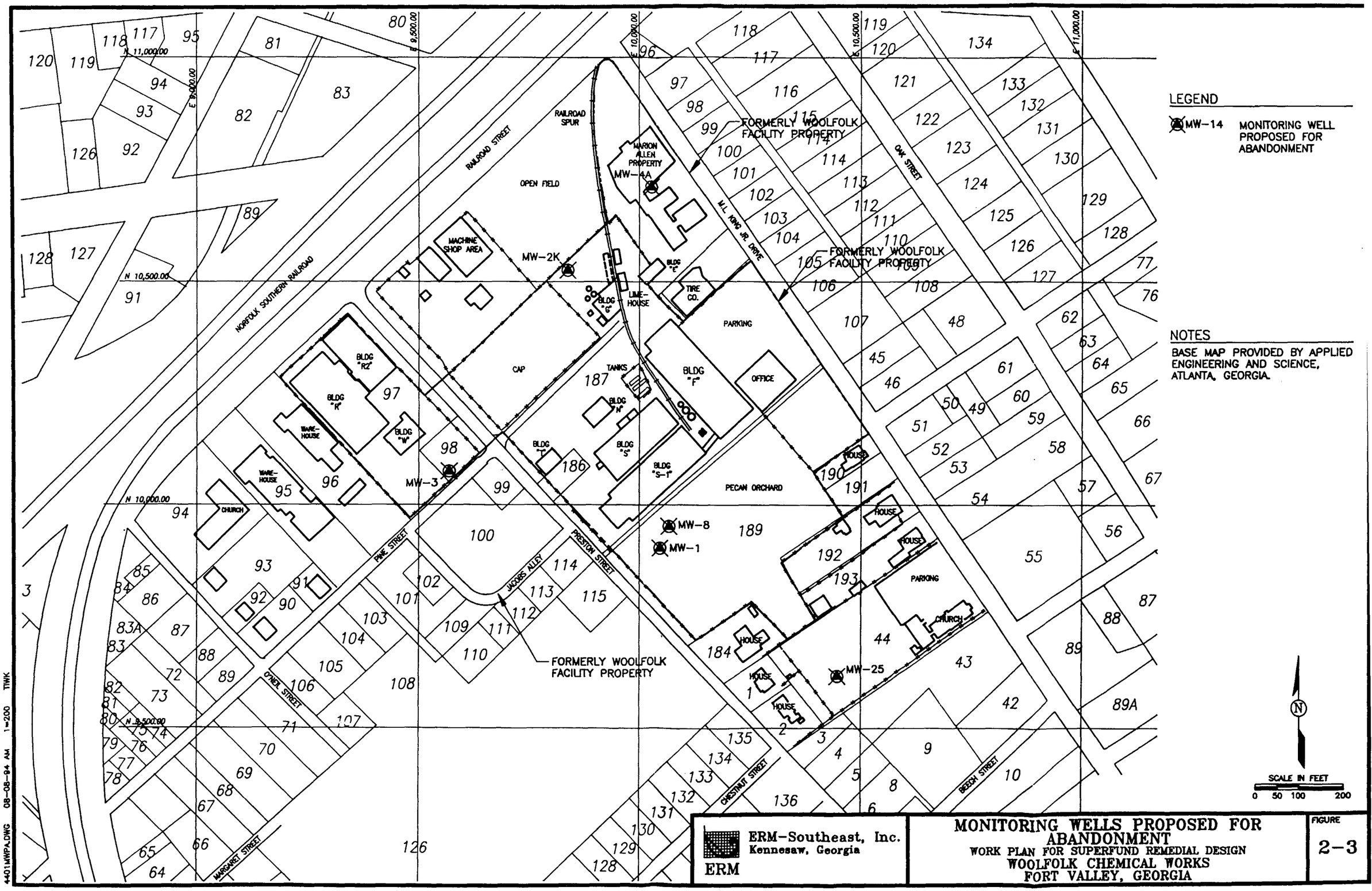
*Infiltration System*

This system is mentioned in the ROD. It is the least desirable technical option due to the large anticipated system requirements for disposal of anticipated quantities. It does have some advantages, however, due to the larger hydraulic gradients that can be created from mounding near the infiltration system. It is proposed to conduct tests early in the RD program since, if this method of disposal requires a system smaller than anticipated, this knowledge could be helpful in selection of the final disposal option.

In order to develop information to evaluate the feasibility of and eventually to develop the design for an infiltration gallery for disposal of effluent from the ground water remediation system, two flooded basin infiltration tests will be conducted. Both tests will be located in the Pecan Orchard. The proposed locations are shown on Figure 2-2.

Each basin will measure approximately eight to 10 feet in diameter and will be constructed using aluminum flashing as described in EPA's Process Design Manual, Land Treatment of Municipal Wastes (1981). Tensiometers will be installed in each basin. The depths to which the tensiometers are installed will be selected based on a review of available information concerning the physical characteristics of the soil types located in the Pecan Orchard. Specifically, the soil survey of Peach County, Georgia will be reviewed for this information. In particular, tensiometers will be located above and below the soil profile's most hydraulically restrictive horizon (i.e. layer).

Following their construction, the basins will be flooded with potable water in an effort to saturate the soil profile at each location. Evidence of saturation will be tracked by monitoring the tensiometers. Saturation will have been achieved

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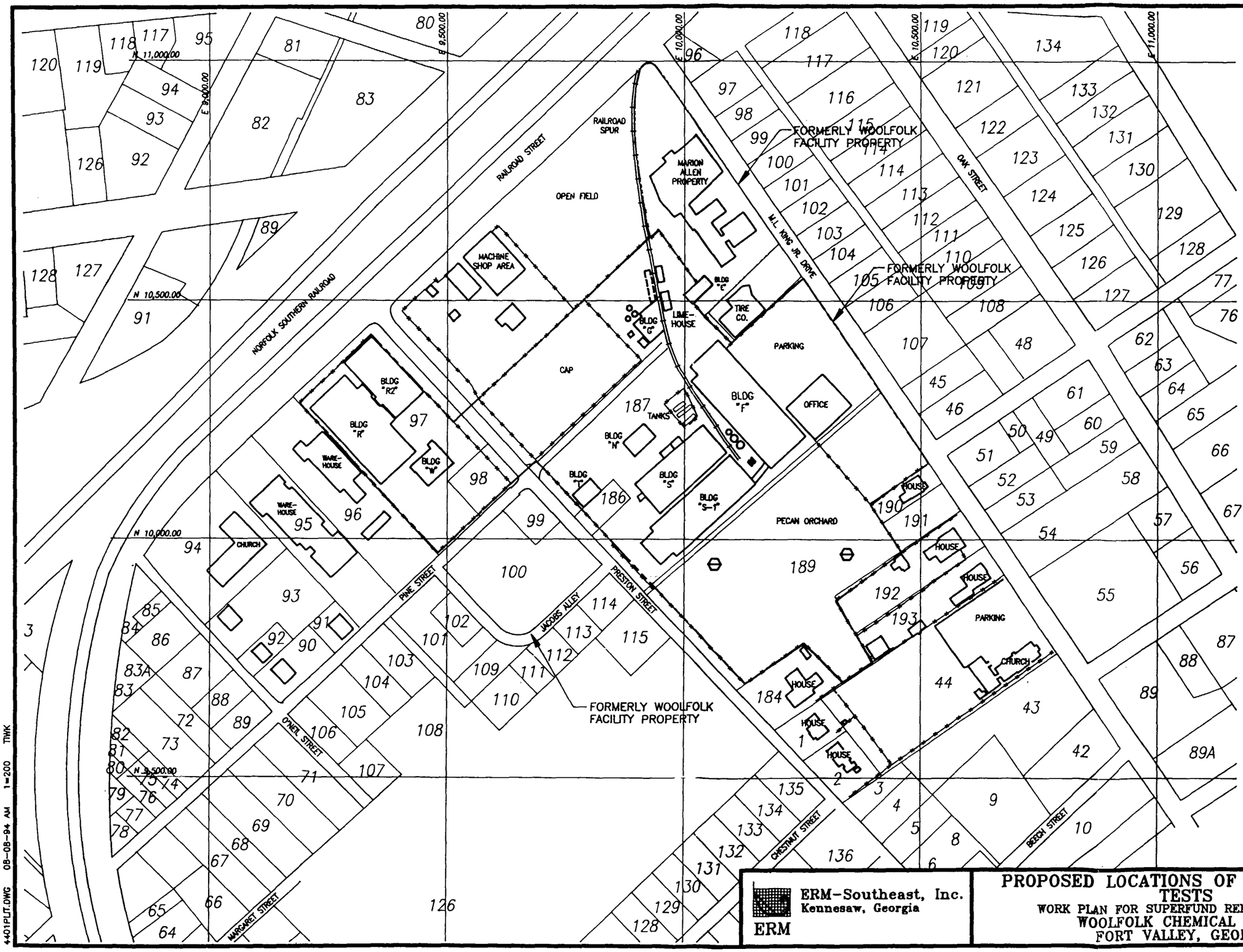
**MONITORING WELLS PROPOSED FOR ABANDONMENT**
WORK PLAN FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 2-3

4401MWPA.DWG 08-08-94 AM 1=200 TIWK




LEGEND

⊖ PROPOSED LOCATION OF INFILTRATION BASIN

NOTES

BASE MAP PROVIDED BY APPLIED ENGINEERING AND SCIENCE, ATLANTA, GEORGIA.

SCALE IN FEET
0 50 100 200

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**PROPOSED LOCATIONS OF INFILTRATION TESTS**
WORK PLAN FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 2-2

4401PLIT.DWG 08-08-94 AM 1=200 TWK

## 2.4 *ADDITIONAL DELINEATION & POST STARTUP WORK*

### 2.4.1 *Confirmation of Aquifer Parameters*

Prior to the start of any additional efforts to further delineate the ground water contamination from at the site, the water table elevation in all wells will be determined using the methods described in Appendix A. The data will be used to develop aquifer parameters in the Surficial and Upper Cretaceous Water Table Aquifers and estimates of the potentiometric surface elevations in the Upper Cretaceous Confined and Tuscaloosa Aquifers resulting from the operation of the ground water extraction system. Actual pumping-capacity and drawdown rates will be determined.

### 2.4.2 *Ground Water Sampling of Existing Wells*

Prior to the installation of additional ground water monitoring wells to further define the extent of contaminants in the Surficial, Upper Cretaceous Water Table and Upper Cretaceous Confined Aquifers, selected existing monitoring wells will be sampled to evaluate current conditions. A summary of these wells is presented in Table 2-3. Also, presented in Table 2-3 is the rationale for including each well in the sampling program.

Each sample will be sampled using the methods described in Appendix A. Each sample will be analyzed for the compounds listed in Table 1-2. Details concerning the laboratory methods used to conduct these analyses are presented in Appendix C.

# TABLE 2-3
# GROUND WATER DELINEATION EFFORTS: EXISTING WELLS TO BE SAMPLED

## Woolfolk Chemicals Works RD/RA

| Aquifer | Wells to be Resampled | Rationale |
|---|---|---|
| Surfical | MW-4B | Located up-gradient of site. Previously low concentrations of Lindane and endosulfan I have been reported. Analyses of new samples will provide updated information concerning the quality of ground water entering the site. |
| | MW-5 | Previously this well has been dry. If capable of producing a sample, analytical data may provide an indication of the lateral extent of contaminants west of the site. |
| | MW-11 | Previously, low concentrations of volatiles and semi-volatiles have been reported in the ground water at this well. Updated data for this well will provide and indication of the current position of the western edge of plume. |
| | MW-15/MW-16 | Data from these wells will provide current data concerning down-gradient extent of plume. |
| | MW-22 | Previously, this well has been dry. If capable of producing a sample, analytical data will provide an indication of the down-gradient extent of plume. |
| Upper Cretaceous Water Table | MW-9/MW-21 | Previously, low concentrations of volatiles and semi-volatiles have been reported. Updated data will provide current information concerning the eastern and western extent of plume. |
| | MW-19 | Updated data will provide information concerning the down-gradient extent of plume |
| | MW-31 | Updated data will provide information concerning conditions up-gradient of site. |
| Upper Cretaceous Confined | MW-2/MW-32/MW-35 | Updated data will provide information concerning current conditions along down gradient position of plume. |

### *2.4.3 Revised Sampling and Analysis Plan (Ground Water Delineation)*

Based on the results of the laboratory analyses conducted on the ground water samples collected from the existing monitoring wells and the results of the ground water elevation monitoring, the locations for additional monitoring wells will be selected if necessary. A revised Sampling and Analysis Plan will be submitted. The additional wells will be installed using the methods described in Appendix A. If, however, the extent of ground water contamination can be defined based on the new water quality data alone, additional wells will not be installed.

### *2.4.4 Field Scale Treatability Study and System Modification Plan*

The operation of the full-scale system will serve as the field-scale treatability study. System optimization will be conducted and the System Modification Plan will be developed if needed. Similarly, ground water delineation studies may also require system modifications which will be incorporated into the System Modification Plan if needed.

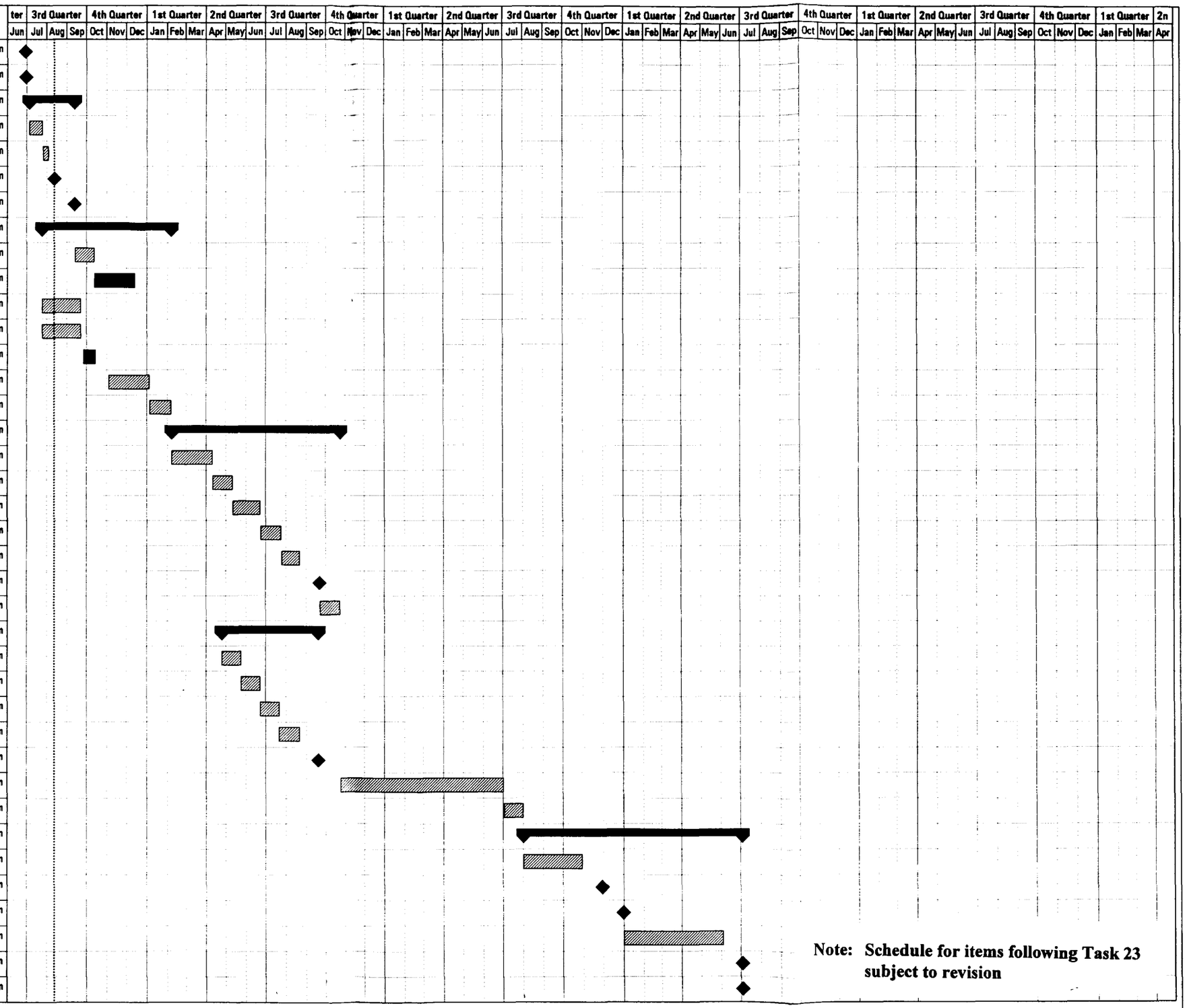
## *2.5 INTERIM REMEDIAL ACTION*

Upon the U.S. EPA's approval of the Preliminary Design, the Respondents may propose to begin interim remedial action activities. They could choose to pursue interim activities if they believe that doing so will offer benefits in terms of cost reductions by expediting the process. Respondents will submit a proposal with the Preliminary Design Report if they wish to pursue these interim activities.

## *3.0 REMEDIAL DESIGN SCHEDULE*

The schedule for the RD is presented in Figure 3-1. As shown, it is anticipated that the RD will require 15 months to complete, including an allowance of 30 calendar days for the EPA's reviews of the various submittals. Figure 3-1 also shows that the Remedial Action Work Plan is scheduled to be submitted to EPA concurrent with the Intermediate Design.

| ID | TASK | Name | Duration | Scheduled Start | Scheduled Finish |
|---|---|---|---|---|---|
| 1 | | Receive EPA NTP | 0d | 6/29/94 8:00am | 6/29/94 8:00am |
| 2 | | Design Strategy Meeting | 0d | 6/30/94 8:00am | 6/30/94 8:00am |
| 3 | | RD Work Plan | 50d | 7/5/94 8:00am | 9/12/94 5:00pm |
| 4 | | Draft Work Plan to CSI | 15d | 7/5/94 8:00am | 7/25/94 5:00pm |
| 5 | | CSI Comments on Plan | 7d | 7/26/94 8:00am | 8/3/94 5:00pm |
| 6 | | Final Work Plan to EPA | 7d | 8/4/94 8:00am | 8/12/94 5:00pm |
| 7 | | EPA Approves Plan | 22d | 8/12/94 8:00am | 9/12/94 5:00pm |
| 8 | | Predesign Work | 141d | 7/25/94 8:00am | 2/6/95 5:00pm |
| 9 | | Aquifer Tests/Sampling | 22d | 9/13/94 8:00am | 10/12/94 5:00pm |
| 10 | | Treatability Tests | 44d | 10/13/94 8:00am | 12/13/94 5:00pm |
| 11 | | POTW Appl. | 44d | 7/25/94 8:00am | 9/22/94 5:00pm |
| 12 | | NPDES Appl. | 44d | 7/25/94 8:00am | 9/22/94 5:00pm |
| 13 | | Infiltration Tests | 15d | 9/26/94 8:00am | 10/14/94 5:00pm |
| 14 | | Predesign Report | 44d | 11/4/94 8:00am | 1/4/95 5:00pm |
| 15 | | EPA Approves | 23d | 1/5/95 8:00am | 2/6/95 5:00pm |
| 16 | | Engineering Design | 185d | 2/7/95 8:00am | 10/23/95 5:00pm |
| 17 | | Preliminary (30%) Design | 45d | 2/7/95 8:00am | 4/10/95 5:00pm |
| 18 | | EPA Comments 30% Desi | 23d | 4/11/95 8:00am | 5/11/95 5:00pm |
| 19 | | Intermediate (60%) Desig | 30d | 5/12/95 8:00am | 6/22/95 5:00pm |
| 20 | | EPA Comments 60% Desi | 22d | 6/23/95 8:00am | 7/24/95 5:00pm |
| 21 | | Prefinal (90%) Design | 20d | 7/25/95 8:00am | 8/21/95 5:00pm |
| 22 | | EPA Comments 90% Desi | 23d | 8/22/95 8:00am | 9/21/95 5:00pm |
| 23 | | Final (100%) Design | 22d | 9/22/95 8:00am | 10/23/95 5:00pm |
| 24 | | RA (1) | 106d | 4/25/95 8:00am | 9/19/95 5:00pm |
| 25 | | Prepare RFP | 22d | 4/25/95 8:00am | 5/24/95 5:00pm |
| 26 | | Evaluate Proposals | 22d | 5/24/95 8:00am | 6/22/95 5:00pm |
| 27 | | Select RA Contractor | 22d | 6/22/95 8:00am | 7/21/95 5:00pm |
| 28 | | Prepare RA Work Plan | 22d | 7/21/95 8:00am | 8/21/95 5:00pm |
| 29 | | EPA Approves | 22d | 8/21/95 8:00am | 9/19/95 5:00pm |
| 30 | | Construct System | 180d | 10/24/95 8:00am | 7/1/96 5:00pm |
| 31 | | Startup System | 22d | 7/2/96 8:00am | 7/31/96 5:00pm |
| 32 | | Post-Startup Work | 241d | 8/1/96 8:00am | 7/3/97 5:00pm |
| 33 | | Confirm Aquifer Paramet | 65d | 8/1/96 8:00am | 10/30/96 5:00pm |
| 34 | | Submit Revised SAP | 22d | 10/31/96 8:00am | 11/29/96 5:00pm |
| 35 | | EPA Approves SAP | 22d | 12/2/96 8:00am | 12/31/96 5:00pm |
| 36 | | Plume Delineation | 110d | 1/1/97 8:00am | 6/3/97 5:00pm |
| 37 | | Submit Delineation Repor | 22d | 6/4/97 8:00am | 7/3/97 5:00pm |
| 38 | | Submit Modification Plan | 22d | 6/4/97 8:00am | 7/3/97 5:00pm |




**Note: Schedule for items following Task 23 subject to revision**

Project:
Date: 8/11/94

Critical Noncritical Progress Milestone Summary Rolled Up

## *4.0 PROJECT MANAGEMENT PLAN*

### *4.1 OBJECTIVES*

The purpose of this Plan is to accomplish the following:

1. To present a data management plan to establish procedures for data documentation and to establish project file requirements;

2. To establish monthly progress reporting procedures and documents;

3. To present the organizational structure for completing the RD; and

4. To establish meetings with the EPA.

The remainder of this section discusses the above topics. More detailed information on portions of these topics is addressed in the Quality Assurance Project Plan (QAPP) in Appendix C.

### *4.2 DATA MANAGEMENT PLAN*

#### *4.2.1 Data Collection and Documentation*

##### *4.2.1.1 Requirements*

In general, data that are collected must be of high quality, defensible, reproducible, and trackable (i.e., unique information must accompany each data item to ensure that data are not mixed up). This requires that data records include the following, at a minimum:

1. a unique sample or field measurement code;

2. the sampling or field measurement location; and sample measurement type;

3. the sampling or field measurement raw data;

4. the laboratory analyses ID number;

5. the property or component measured, and

6. the result of analysis (e.g., concentration).

#### *4.2.1.2 Data Control*

This section provides guidelines for collecting and transferring data obtained during various field investigations. Standardized forms and procedures ensure the collection and subsequent transfer of data in an accurate and consistent manner. The collection and transfer of such data provide the input that will ultimately be used in decision-making. Since every piece of data could affect such decisions, it is critical that all data be collected and transferred with a high degree of accuracy.

Data that will be collected and transferred in this RD include the following:

1. general field notes (always kept in a bound log);

2. the daily report, which is a concise summary of daily field activities;

3. drilling logs for recording blow count information, lithology, and pertinent data for monitor wells;

4. well level records, which provide a concise summary of well level information;

5. the traffic report, which is used in conjunction with the chain of custody form;

6. the chain of custody form, which provides a permanent record of unique sample numbers, sample descriptions, analyses requested, and persons responsible for the sample.

Figures 4-1 through 4-6 provide examples of each of these forms.

*4.2.1.3 Procedures*

Individual Responsibilities:

1. Project Manager

The project manager is responsible for:

a. Ensuring that staff assigned to the field project have been properly briefed regarding the specific goals of the project and their specific responsibilities;

b. Assigning the appropriate knowledgeable professionals to the specific area requiring the collection of data;

①

Envirosafe L.F.

5-8-87

PERSONNEL PRESENT:

WEATHER DESCRIPTION:

FIELD TASKS, OBSERVATIONS, NOTES ON SAMPLES COLLECTED:

- LOCATION of Sample
- Depth-to-Water
- Depth-to-bottom
- PURGE Volume
- PURGE Method
- Physical Observations (i.e. odor, Sheen)
- FIELD MEASUREMENTS pH, Specific Conductance
- Sample Collection Equipment
- Time of Collection, ERM T.R.#

EQUIPMENT Calibration:

Decontamination Methods Used:

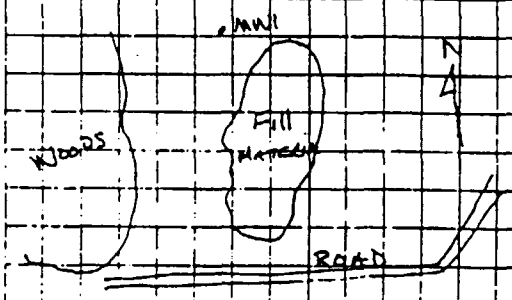
D.R. Blye 5/8/87

②

Envirosafe L.F.

5-8-87

Relevant SKETCH: (or attach location map)

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EXAMPLE FIELD LOG

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# EXAMPLE OF FIELD LOG

WORK PLAN FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 4-1

# ERM- Daily Report

Time In : _____ Log No.: _____

Time Out: _____

Date : _____

Well I.D.: _____ Boring or Drilling Method: _____ Boring or Well Size: _____

Supervisor/Geologist: _____ Driller : _____

Drilling Company : _____ Helper: _____

Daily Activities –

- ☐ Mobilization
- ☐ Decontamination
- ☐ Set-up
- ☐ Drilling/Augering/Coring
- ☐ E-logging (standby)
- ☐ Reaming
- ☐ Setting Surface Casing
- ☐ Well Installation
- ☐ Well Development
- ☐ Clean-up
- ☐ Standard Penetration Test
- ☐ Other (explain): _____

Footage- Drilled: _____ ft. to _____ ft. Reamed: _____ ft. to _____ ft.

Augered: _____ ft. to _____ ft. Cored: _____ ft. to _____ ft.

Bit Sizes: _____ _____

Sample Type: _____ Quantity: _____ S.P. Tests: _____ (Qnty)

Time – Drill/Rig : _____ hr. Well Development: _____ hr.

Decontamination: _____ hr. Down Time : _____ hr.

Stand-by : _____ hr. Other : _____ hr.

Explanation : _____

Materials Used – Bentonite: _____ bags Bentonite: _____ buckets

Cement : _____ bags Other : _____

Sand : _____ bags Explain : _____

Verification of Activities: _____ Date: _____

(Signature – Driller)

Well type (Strata) – ☐ Alluvial ☐ DG/R ☐ Bedrock ☐ Other: _____

Well Construction –

Screen Setting: _____ ft. To: _____ ft. BLS Casing Type: _____

Seal Setting : _____ ft. To: _____ ft. BLS Casing Size : _____

Grout Setting : _____ ft. To: _____ ft. BLS Drain Hole : Yes No

Stamped ID: Yes No

Comments: _____

Verification of Activities: _____ Date: _____

(Signature: Project Geologist)

| If Well Completed | |
|---|---|
| Footage Summary | |
| Alluvial | : _____ ft. |
| DG/R | : _____ ft. |
| Bedrock | : _____ ft. |
| No. Samples | : _____ ft. |
| No. SP Tests | : _____ ft. |
| Other | : _____ |

Approved for payment: Standby hours: _____ hr.

Well accepted: Yes No

Field Manager: _____ Date: _____

(Signature)

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**ERM–DAILY REPORT**
**WORK PLAN FOR SUPERFUND REMEDIAL DESIGN**
**WOOLFOLK CHEMICAL WORKS**
**FORT VALLEY, GEORGIA**

FIGURE 4–2

4401DYRP.DWG 07–26–94 AM 1=1 TMK

**Environmental Resources Management**

# Drilling Log

Project _____ Owner _____

Location _____ W.O. Number _____

Well Number _____ Total Depth _____ Diameter _____

Surface Elevation _____ Water Level: Initial _____ 24-hrs. _____

Screen: Dia. _____ Length _____ Slot Size _____

Casing: Dia. _____ Length _____ Type _____

Drilling Company _____ Drilling Method _____

Driller _____ Log By _____ Date Drilled _____

Sketch Map

Notes

| Depth (Feet) | Graphic Log | Well Construction | Sample Number | Description/Soil Classification (Color, Texture, Structures) |
|---|---|---|---|---|
| | | | | |

Page ____ of ____

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ERM–DRILLING LOG
WORK PLAN FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 4–3

4401DLOG.DWG 07–26–94 AM 1=1 TWK

# TABLE 4-2
# WATER LEVEL DATA SUMMARY

## Woolfolk Chemical Works

| Well I.D. | Depth to Water (BTOC) (feet) | Top of PVC Casing Elevation (feet) | Water Level Elevation (feet) | Top of Screen Elevation (feet) | Bottom of Screen Elevation (feet) | Screen Length, (feet) |
|---|---|---|---|---|---|---|
| SK-1 | 19.02 | 1067.98 | 1048.96 | 1053.68 | 1038.68 | 15 |
| SK-1D | 17.44 | 1054.71 | 1037.27 | 1010.71 | 1005.71 | 5 |
| SK-2 | 18.80 | 1061.28 | 1042.48 | 1044.78 | 1029.78 | 15 |
| SK-3 | 16.52 | 1054.69 | 1038.17 | 1039.69 | 1024.69 | 15 |
| SK-4 | 18.31 | 1060.02 | 1041.71 | 1048.72 | 1033.72 | 15 |
| SK-5 | 3.90 | 1036.74 | 1033.65 | 1019.84 | 1004.84 | 15 |
| SK-6 | 19.71 | 1061.17 | 1041.46 | 1046.67 | 1031.67 | 15 |
| SK-7 | 19.89 | 1060.90 | 1041.01 | 1034.23 | 1024.23 | 10 |
| SK-8 | 16.66 | 1056.00 | 1039.34 | 1019.90 | 1009.90 | 10 |
| SK-9 | 12.67 | 1056.60 | 1043.93 | 1044.90 | 1029.90 | 15 |
| SK-10 | 2.97 | 1031.22 | 1028.25 | 1000.22 | 990.22 | 10 |
| SK-11 | 4.82 | 1032.29 | 1027.47 | 1001.29 | 991.29 | 10 |
| C-3 | 10.87 | 1053.35 | 1042.48 | 1030.20 | 1025.20 | 5 |
| C-5 | 1.06 | 1034.92 | 1033.86 | 1018.82 | 1013.82 | 5 |
| C-8 | 2.96 | 1044.92 | 1041.96 | 1029.47 | 1024.47 | 5 |
| TW-1 | 8.27 | 1045.92 | 1037.35 | 1008.12 | 1005.62 | 2.5 |
| TW-7 | 4.66 | 1048.39 | 1043.73 | 1010.89 | 1008.39 | 2.5 |
| W-8 | 12.67 | 1053.94 | 1041.27 | 1010.90 | 1000.90 | 10 |
| W-9 | 1.02 | 1035.30 | 1034.28 | 1022.98 | 1012.98 | 10 |

Notes:
1. BTOC = Below Top of PVC Casing
2. Water level measured in monitoring well W-8 was not use dot construct the map of estimated water table contours.

**Environmental Resources Management**

## Water Level Data Summary

Project _____ Station Location _____

Elevation of Measuring Point _____ Land Surface Elevation _____ Height of M.P. Above L.S. _____

| Date | Time | Elevation of M.P. (+ MSL) | − Water Level Below M.P. (ft) | = Water Level Elevation (+ MSL) | Water Level Below M.P. (ft) | − Height of M.P. Above L.S. (ft) | = Depth To Water Below L.S. (ft) | Comments |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

Page ____ of ____

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**WATER LEVEL DATA SUMMARY**
WORK PLAN FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 4-4

The ERM Group

# Traffic Report

**1 Project W.O.** 21722

Project Name/Location

**2 Sample Concentration**

☐ Low Concentration

☐ Medium Concentration

**3 Ship to:**

**4 Sample Matrix**

☐ Liquid ☐ Solid

☐ Other

**5 Sampling Personnel Contact**

Sampler:

Project Manager

Phone No. (215) 524-3500

Attn:

**6 Shipping Information**

(Name of Carrier)

(Date Shipped)

(Airbill Number)

**7 Specify Type of Analyses, Number of Containers, Approx. Volume**

| Analyses / Method Requested | No. of Bottles | Total Volume |
|---|---|---|
| | | |

**8 Sample Location**

Date:

Time:

**9 Sample Description**

☐ Surface Water ☐ Soil

☐ Ground Water ☐ Solid

☐ Leachate ☐ Other:

☐ Sediment

**10 Special Handling (e.g. Safety Procedures/Hazardous)**

Additional comments: (Specify data package, rush work, special detection limits, etc.)

**11 Condition of Samples Received (to be completed by Laboratory Log-in.)**

☐ Samples received intact

☐ Samples at 4 degrees (C)

☐ Samples not leaking

☐ Container numbers match as specified in Item 7

☐ Container tags match Chain of Custody

☐ Cooler received with Custody Seals intact

☐ Samples contained within plastic bags

Log-In Person's Signature

Copies: White & Yellow copies accompany sample shipment to laboratory. Yellow copy retained by laboratory. White copy to be returned to ERM for files. Pink copy retained by sampler. Gold copy extra copy as needed (warehouse).

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TRAFFIC REPORT
WORK PLAN FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 4-5

c. Ensuring that all data recorded during the course of a field investigation are recorded on the appropriate forms and are consistent with the requirements established during project design;

d. Routing the collected data, as appropriate, to other members of the project team;

e. Maintaining copies of all data obtained on the appropriate form in the project file;

f. Selecting a project member who can check that all transcription of field data and analytical data has been performed properly; and

g. Budgeting project time for the review of data (analytical data and field data) to ensure accuracy in this transcription.

2. Staff Members

Staff members have the following responsibilities:

a. Every staff member must have a thorough understanding of his/her responsibility within the project. In addition, every staff member must have a thorough understanding of the data control requirements in the site-specific QAPP, if applicable;

b. Staff members assigned to record/transcribe data must do so on the approved forms in a complete, orderly, neat, and accurate fashion;

c. All data should be proofed and signed for accuracy by a team member who has not participated in the data entry/transcription;

d. Team members designated to record data are responsible for submitting the original to the project manager and maintaining a copy for their own file.

***Procedures for Data Entry and Documentation***

1. Figures 4-2 through 4-6 will be used as appropriate forms for the entry and documentation of data obtained during the project.

2. Preprinted forms are not provided for field notebooks. Field notes should be entered in bound log books. All information from the field investigation must be entered to enable reconstruction of the field event. Notes should include the site name (top of each page), sample identification, a brief description of the sample, date and time of collection, sampling methodology, field measurements, all observations, and the sampler s initials (bottom of each page, with date).

3. All project data that have been transcribed should be checked to ensure accurate transcription.

4. The original data entry forms will be retained in the project file.

### *4.2.2 Laboratory Analytical Data Validation Procedures*

#### *4.2.2.1 Purposes*

This section provides general guidance on conducting laboratory analytical data validation. Data validation is a critical project task which provides the project team with an assessment of data accuracy, precision, and usability. Conclusions and recommendations based on questionable or inaccurate data can be extremely costly. The data validation process tends to minimize this possibility.

#### *4.2.2.2 Responsibilities*

1. ***Quality Assurance Scientist.*** The quality assurance scientist is responsible for performing data validation according to appropriate methods, documenting all findings, and qualifying the data in a summary report.

2. ***Quality Assurance Manager.*** The quality assurance manager is responsible for the final review of work produced by the quality assurance chemist for technical accuracy and completeness.

#### *4.2.2.3 Procedures*

Prior to the start of any analytical work, the Project Manager, in conjunction with the quality assurance manager, should determine the type of data package and amount of raw analytical data to be compiled by the laboratory to meet the particular project objectives. Several levels of data reports are commercially available and generally include the following:

1. **Limited data report:** This level of data reporting includes the analytical reports, chain of custody documentation, and summaries of quality control measures such as method blank results, spike analyses, and duplicate analyses.

2. **Sample data report:** This level of data reporting includes the above information and raw data and instrument printouts for the samples only.

3. **Complete data report:** This level of data reporting includes all raw data and instrument printouts for the samples, standards, and quality control samples. All information necessary to completely evaluate the qualitative and quantitative reliability of the data is available in the complete data package. An example of a complete data package is the EPA Contract Laboratory Program (CLP) data package.

***Preliminary Review***

All information pertinent to the sample data to be reviewed should be obtained, such as field notes, sample locations, maps, number of samples, and the analyses requested. A thorough understanding of the project objectives should exist to focus the data validation. In the preliminary review, the data package should be checked to ensure that all requested documentation is present and in order. Any documentation that is missing should be immediately brought to the attention of the laboratory. A data summary table presenting the results of the sample analyses should also be prepared during the preliminary review.

***Data Evaluation***

Once all the documentation pertaining to the samples is in order, a detailed data

evaluation is made. The primary purpose of the validation is to ensure the qualitative and quantitative reliability of the reported resulted. The individual checks to be made depend upon the level of the data report obtained and the analytical methods used. Areas to be examined during a complete review of organic and inorganic analyses are summarized on Table 4-1. ERM currently follows the guidance provided in the Laboratory Data Validation Functional Guidelines for Evaluating Organic (and Inorganic) Analyses (U.S. EPA) to evaluate the areas listed on Table 4-1.

### *Support Documentation*

Support documentation should be prepared during the validation process. It should include documentation of all quality control data required for the analytical methods and an indication of whether it was performed acceptably. If unacceptable quality control data are found, their impact on the results should be summarized in a report for the support documentation. The support documentation should also include photocopies of all errors found, with the correct information replaced and noted.

### *Quality Assurance Report*

If requested by the Project Manager, a quality assurance report is prepared at the completion of the data validation summarizing all the findings and qualifying the data usability. The report must indicate the analyses that were performed and the areas evaluated during the data validation review. Problems that were found during the review are expressed in terms of the impact on the data usability. The proper qualifier codes should be selected to express data usability and these codes placed next to affected data on the summary tables. Examples of common qualifier codes are B , which indicates a similar concentration level of the analyte

# TABLE 4-1
# ITEMS TYPICALLY REVIEWED DURING DATA VALIDATION

## Woolfolk Chemical Works

| Areas Examined | Applicability (Organic, Inorganic, Both) | Items Reviewed by Data Report Level* |
|---|---|---|
| ERM and Laboratory Chain of Custodies (Traffic Reports, Field Notes, etc.) | Both | 1, 2, 3 |
| Laboratory Narrative and QC Summaries | Both | 1, 2, 3 |
| Holding Times | Both | 1, 2, 3 |
| Extraction/Digestion Logs | Both | 1, 2, 3 |
| Blanks - Field and Laboratory (Accuracy) | Both | 1, 2, 3 |
| Instrument Mass Tune | Organic | 3 |
| Standards | Both | 3 |
| Linearity | Both | 3 |
| Sensitivity/Stability | Both | 3 |
| Selectivity/Specificity | Both | 3 |
| EPA Criteria (SPCC & LCS) | Both | 3 |
| Variability of Technique (Internal Standards) | Organic | 3 |
| Analyte Breakdown | Organic | 3 |
| Analytical Sequence | Organic | 3 |
| ICP Interference | Inorganic | 3 |
| Control Standards | Inorganic | 3 |
| Samples | | |
| Detection Limits | Both | 2, 3 |
| Instrument Printouts | Both | 2, 3 |
| ICP Data | Inorganic | 2, 3 |
| AA Data | Inorganic | 2, 3 |
| GC Data | Organic | 2, 3 |
| GC/MS Data | Organic | 2, 3 |
| Autoanalyzer Data | Inorganic | 2, 3 |
| Qualitative Identification | Both | 2, 3 |
| Mass Spectra | Organic | 2, 3 |
| Tentatively Identified Compounds | Organic | 2, 3 |

* Data Package Levels:
1 - Limited Data Report
2 - Sample Data Report
3 - Complete Data Report

was found in a method blank or travel blank, and J which indicates that the concentration value is a quantitative estimate. The QA report is presented to the project team to allow them to use the data confidently. The report should address the significance of any errors found on subsequent work and decisions.

### *4.2.3 Project Filing Requirements*

#### *4.2.3.1 Purpose*

This section provides guidelines for filing documents. Many types of documents are prepared which should be filed, including letters, telephone memos, reports, and proposals. Many types of documents are also received which should be included in the central files. Filing all of this information allows a project to be traced, should the need arise.

#### *4.2.3.2 Procedure*

General

All project documentation including:

a. Correspondence
b. Telecons
c. Reports
d. Maps and drawings
e. Analytical data
f. Field notes
g. Calculations

are maintained in central project files. These files are accessible to all staff members who may need reference information. Project files for closed projects are archived in a separate area. Hard copy files of closed project information are kept for two years.

Sign-out cards are used for any files to be taken out of the central files. The cards are easily noticed and have sign-out lines so that the file clerk can determine who is responsible for any file that has been removed from the central files. Files may be checked out for up to 24 hours. File contents needed for an extended period of time should be given to the file clerk who will make copies for the requestor s use.

Every project has a separate folder(s) containing all written materials pertaining to that particular project. This includes incoming and outgoing correspondence, telephone memoranda, invoices, proposals, reports, etc.

The project number is included on every document to help expedite and ensure accuracy in filing documents. The project number is included at the top of page 1 in letters and in the headers of all other documents. The project manager is responsible for ensuring that all material is sent to this file.

Before a project is closed, project files should be compiled. The files are kept in the active central file for two years after project completion. After two years, the files are archived.

Draft reports will be discarded as the final report is completed and sent to the central files, unless otherwise directed (for example, drafts containing the client s written comments should be kept).

### *Employee Responsibility*

If copies of project documents are made by a file clerk or word processing support staff, these individuals will make sure the appropriate number of copies are made for distribution and will be place copies in the central files. The individual making the copies is responsible for placing the copies in the appropriate files or for giving the copies to the file clerk with clear instructions on where the copies are to be placed.

### *Disk Storage*

All reports that are completed in word processing are stored on floppy disks. This enables access and reuse of files that have already been typed. The disks are filed numerically by project number. Data tables produced by the data entry clerk are stored on project disks filed numerically in the central computer room. Documents and graphics produced on their systems by technical staff members will be retained as determined by the Project Manager.

### *Personal Files*

Personal files should be maintained in individual offices, as required, to efficiently implement work assignments. These files are in no case to considered a substitute for the central files. Maintenance of personal files is the responsibility of the individual and is not a duty of the file clerk or their support staff.

### *4.2.4 Data Reporting*

The data most commonly included in reports are liquid-level data and air, soil, and water quality data.

1. Reports of liquid level data will include the following information:

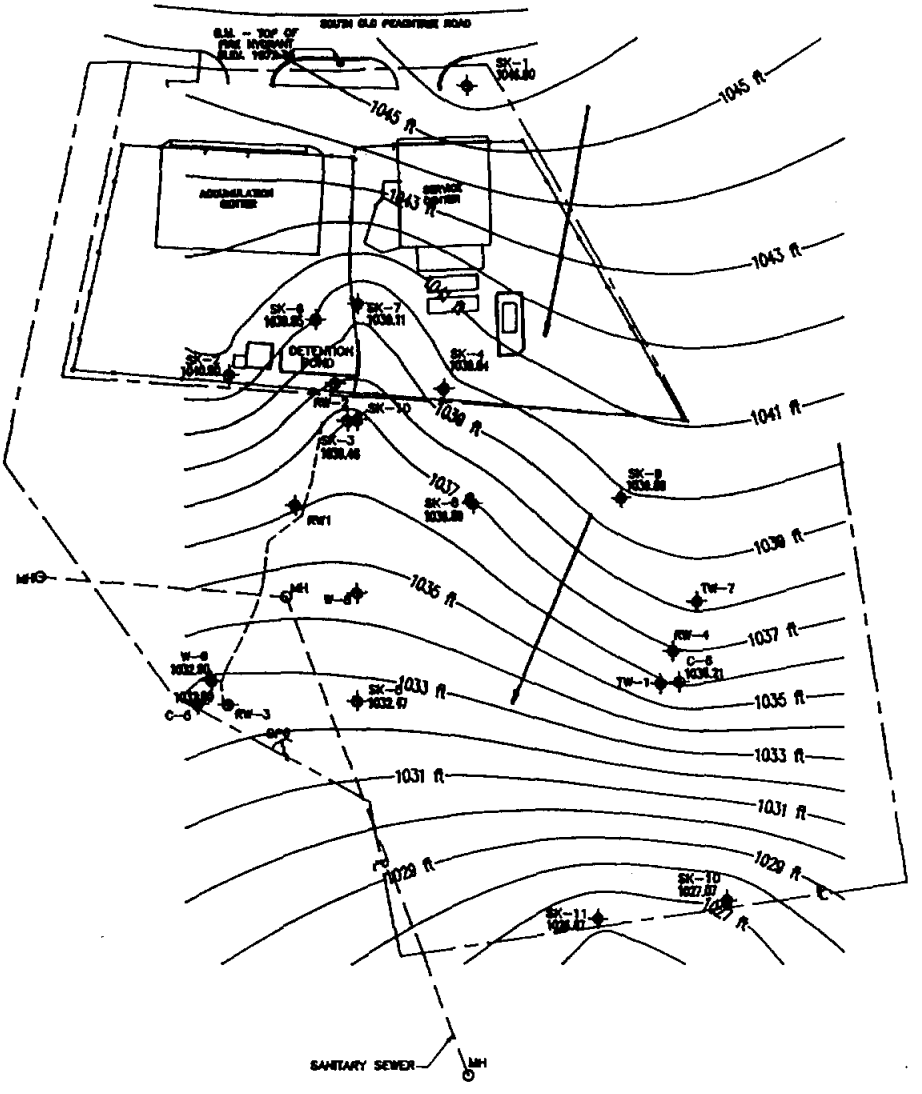
   - well number;
   - measuring point elevation (relative to mean sea level, in feet);
   - depth to water; and
   - water table elevation.

When free-floating product is present within wells, additional information will include:

- depth to product;
- product thickness; and
- corrected water table elevation.

Liquid level data will be summarized in tabular form and contour maps for inclusion into reports. Table 4-2 is an example of a liquid level data table and Figure 4-7 is an example of a water table contour map.

2. Laboratory reports will include the following information:




LEGEND

- SK,W,C – MONITORING WELL
- DRAINAGE WAY
- MH MANHOLE
- 1030 —— 1030 CONTOUR OF WATER TABLE ELEVATION
- SEWER LINE
- ESTIMATED DIRECTION OF GROUND WATER MOVEMENT

NOTE

SK-10,TW-1, TW-7 AND W-6 WERE NOT USED IN PREPARING THIS MAP SINCE THEY ARE NOT WATER TABLE WELLS. NO GROUND WATER ELEVATION DATA WAS OBTAINED FROM RW-1, RW-2, RW-3 OR RW-4.

N

SCALE IN FEET

0 250 500 1000

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# ESTIMATED WATER TABLE CONTOURS MARCH 18, 1994

WORK PLAN FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 4-7

4401EWTC.DWG 07-26-94 AM 1=150 TMK

- sample identification numbers (site and laboratory numbers);
- date sampled, date received, and date analyzed;
- parameters measured and resulting concentrations;
- reporting units;
- analytical methods and detection limits;
- certification statement of data validation; and
- adherence to sample holding times.

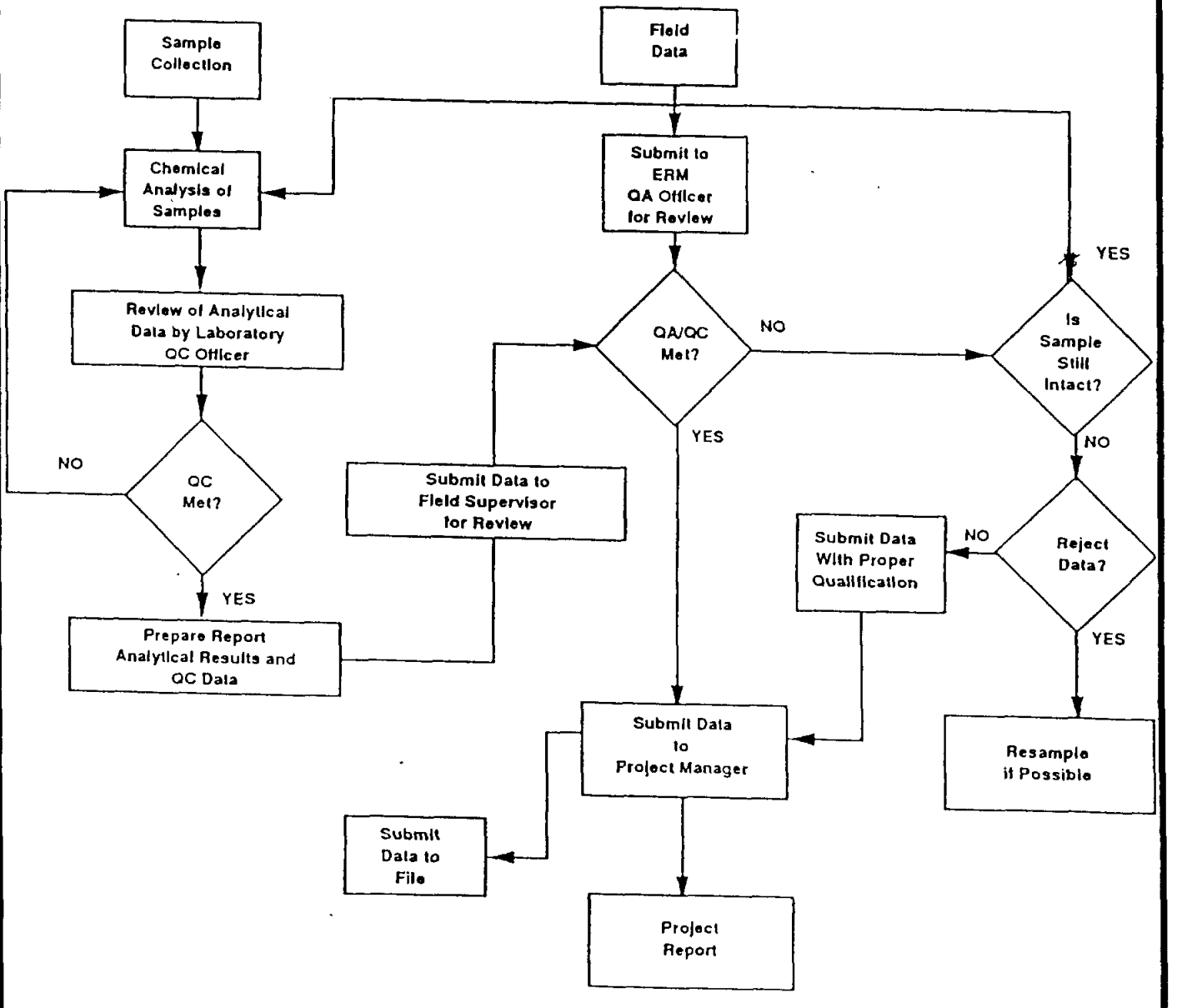
Laboratory data will be summarized in tabular format and spread sheet software such as Lotus 1-2-3 or Microsoft Excel. Table 4-3 is an example this type table for historical ground water trends at a RCRA Corrective Action Site in Georgia.

### *4.2.5 Report Storage*

All analytical data, quality control data, and formal reports are retained indefinitely. Hard copies are retained for a minimum of one year.

### *4.2.6 Data Flow*

The general flow of data from the time of data collection to the storage of validated data is summarized in Figure 4-8.

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# SUMMARY OF FIELD AND ANALYTICAL DATA FLOW

WORK PLAN FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 4-8

4401FADF.DWG 07-26-94 AM 1=1 TMK

## *4.3 PROGRESS REPORTING*

Monthly progress reports will be submitted to the EPA as required by the UAO. These reports will include:

1. description of the actions which have been taken to comply with this Order during the prior month;

2. all results of sampling and tests and all other data received by Respondents and not previously submitted to EPA;

3. all plans, reports, deliverables, and procedures completed under the work plans during the previous month;

4. description of all work planned for the next month with schedules relating such work to the overall project schedule for RA completion; and

5. description of all problems encountered and any anticipated problems, any actual or anticipated delays, and solutions developed and implemented to mitigate or address any actual or anticipated problems or delays.

An example report is included in Appendix E.

## *4.4 PROPOSED MEETINGS WITH THE EPA*

Meetings may be held with the EPA at its or at Respondents request at milestones discussed in Section 3 of this Work Plan. These meetings will be held to clarify issues that may arise from the EPA s review of various submittals.

## 4.5 *PROJECT MANAGEMENT*

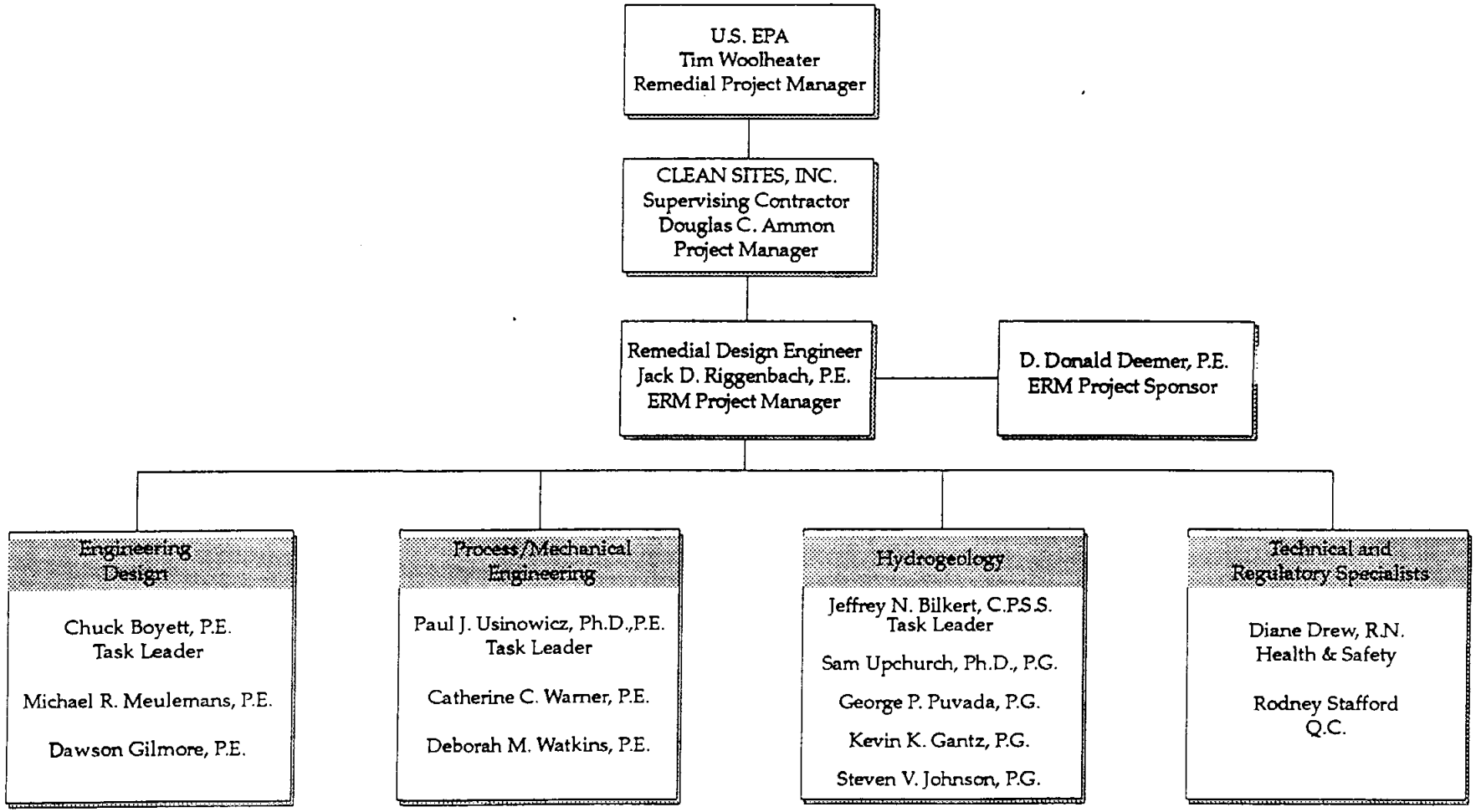
The project team will consist of a Supervising Contractor, Clean Sites, Inc., and the Remedial Design Engineer, ERM. Within ERM, there will be a Project Sponsor, a Project Manager, and engineering design, process/mechanical engineering, hydrogeology, and technical and regulatory specialists. The organizational hierarchy for this project is shown in Figure 4-9. The chain of communication follows the organizational chart (Figure 4-9). Both written and oral communication will be passed up the chain of command.

### *KEY STAFFING*

The following key staff are proposed. Professional Profiles are provided in Appendix F.

#### *ERM Project Sponsor*

*Don Deemer, P.E.* has more than 25 years of diversified experience in the field of engineering and environmental management. He is a Registered Professional Engineer in six states. Mr. Deemer has extensive experience in wastewater treatment, pretreatment technologies, and permitting. He was project manager for development of a ground water remediation system involving organics and inorganics for a Superfund site in Ohio. He has qualified on a number of occasions for expert witness testimony. Mr. Deemer is also a nationally recognized expert in natural systems (soil and vegetation) for wastewater treatment and has authored numerous technical publications on the subject. Mr. Deemer is a Principal of ERM-Southeast, Inc. and manager of ERM-Southeast's Kennesaw, Georgia office. His role will be to provide senior technical review at appropriate milestones throughout the project and to assist the Project Manager on an as-needed basis in reviewing work products, schedules, and budgets.

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ORGANIZATION CHART
WORK PLAN FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE
4-9

***Project Manager***

*Jack D. Riggenbach, P.E., DEE* is the proposed project manager. He has 22 years experience in environmental engineering and construction. He is a Registered Professional Engineer in five states including Georgia, a licensed building contractor in Florida, and a Diplomate of the American Academy of Environmental Engineers. He has managed or is managing RCRA remedial facility investigations and corrective action projects and CERCLA removal actions, remedial investigations, feasibility studies, and remedial designs.

Mr. Riggenbach was project manager on the Pioneer Sand Superfund site Remedial Design under a contract with Clean Sites, Inc. He has conducted bench- and pilot-scale studies for metals removal and detailed engineering design for wastewater projects involving metals, pesticides, and other organics. Metals treatment technologies used in this previous work included ion exchange, precipitation, ultrafiltration, clarification, and sludge dewatering. He was the process engineer on the EPA's effluent guidelines study of the pesticide industry. In that capacity, he evaluated treatment technologies for their applicability to remove pesticides. He has been in responsible charge of ground water remediation projects in Georgia and elsewhere in the southeast U.S. Responsibilities have included site investigations, remedial design, agency negotiations, extraction and treatment system construction, and operations and maintenance. Ground water treatment system sizes have ranged from 5 to 350 GPM. As Project Manager, it will be his responsibility to handle day-to-day client communications, staff assignments, and other resource commitments.

### *Hydrogeology Task Manager*

*Jeffrey N. Bilkert, C.P.S.S.* is the proposed hydrogeology task manager. He is a Certified Professional Soil Scientist with over 15 years of experience in environmental related activities. Mr. Bilkert has managed site investigations at RCRA-regulated and other hazardous sites. He has also been responsible for designing and implementing corrective action activities at these facilities. The corrective action activities have included excavation and removal of contaminated materials, lagoon closures, and ground water pump and treat programs. As part of a pump and treat system for a former wood treating site, he developed two documents necessary to obtain a State Indirect Discharge (SID) permit. This allowed recovered ground water to be discharged to a local POTW.

He is currently project manager responsible for evaluating the extent and remediation of a ground water contaminant plume at a site where nearby, privately-owned residential water supply wells have been contaminated by chlorinated solvents. His responsibilities associated with this project have included leading several meetings with private citizens and public officials to apprise them of ongoing activities and results. He has recently supervised an aquifer testing program at the site. Aquifer parameters developed from the test data will be used as part of a computer modeling effort to simulate several recovery scenarios at the site. As hydrogeology task manager, it will be his responsibility to handle day-to-day client communications, communications with local property owners, staff assignments, and subcontractor oversight associated with the proposal efforts to further delineate the plumes.

### *Engineering Design Task Manager*

*V.W. Chuck Boyett, P.E., R.L.S.*, is the proposed engineering design task manager.

He is a Registered Professional Engineer in four states including Georgia, and a Registered Land Surveyor with over 21 years of experience in environmental engineering design and construction management. Mr. Boyett has served as the project design engineering manager for the design of a wide range of environmental remedial action projects including ground water recovery and treatment systems for large petroleum fuel releases, chromic acid releases, solvents and pesticides contamination and the recovery and treatment of liquid wastes associated with a large organic chemicals manufacturing facility. He has also been involved in a wide range of sanitary sewage and process wastewater treatment projects including several types of biological treatment processes and a large metals removal treatment process which required a 2 MGD ion exchange system. In addition to being responsible for the overall engineering design of these projects he has also served as the project manager for the construction, installation, and process start-up and operation of these systems. He is currently serving as the project manager/design engineer for a ground water recovery and metals removal and treatment system at a 16-acre site in Tennessee where both on-site and off-site remediation are required. His responsibilities on this project have also included meetings and coordination with regulatory agencies and adjacent property owners and their attorneys. In addition to these responsibilities he has also been responsible for communicating with local agencies and authorities for the discharge of the treated effluent and assessing the potential long-term impacts to future development in the surrounding area.

As Engineering Design Task Manager for this project, his duties will primarily be associated with the coordination and production of the engineering design drawings and project specifications for the ground water recovery and treatment system. This will include oversight of all the engineering design disciplines as well as in-house coordination with the process engineering and hydrogeology task groups to assure the final design conforms to the performance requirements and

technical criteria established by these groups.

***Process Engineering Task Manager***

*Paul Usinowicz, Ph.D., P.E.* Dr. Usinowicz has 26 years of diverse environmental engineering experience, including university teaching, research, and consulting specializing in water and wastewater treatability and water quality issues. He has nine years experience with the chemical industry for waste handling and disposal technologies for meeting environmental regulations, including toxic and listed RCRA hazardous wastes. Dr. Usinowicz's experience includes wastewater and ground water treatability assessment and design, site assessment, ground water contamination assessment and remediation, wastewater toxicity reduction, waste elimination and minimization, operations training and troubleshooting, ambient air monitoring, treatment systems monitoring, and aquatic bioassay assessments. Wastewater treatment assessment including laboratory bench scale treatability work, pilot scale treatability studies, and full-scale treatment design and operations.

He has performed feasibility studies, treatability studies, and developed preliminary designs for removal of heavy metals (lead, chromium, zinc, beryllium, copper, iron, silver, cadmium, arsenic, mercury, and aluminum) from process wastewaters and contaminated ground waters for various metals industries. Methodologies tested and designed include reverse osmosis, ion exchange, and various chemical precipitation technologies. Residuals handling an disposal were integrated in design. Tests were for active manufacturing facilities, Superfund sites, and the NPL contaminated sites.

### *Health and Safety Officer*

*Diane Drew* is a Registered Nurse with more than 20 years experience as a public and occupational health professional. She has served as a community liaison in providing grass-roots coordination in residential neighborhoods impacted by environmental remediation activities and has extensive environmental and community health experience. In her capacity as a Site Health and Safety Coordinator for various site remediation operations, Ms. Drew has developed and implemented site-specific health and safety plans and monitored site conditions to detect potential health and safety hazards. She has established community outreach programs to provide public health information and resources to concerned citizens. Ms. Drew has developed emergency response plans and coordinated utilization of emergency responders. She has served as a public health interagency contact in interpretation, impact analysis, and implementation of public health policy and regulatory standards.

### *Treatability Studies*

***Deborah M. Watkins, P.E.*** Ms. Watkins has over 11 years of experience in environmental engineering involving project engineering and management responsibilities. She focuses her expertise primarily in process design involving feasibility analyses, treatability studies, interfacing with detailed design engineers, and troubleshooting installations after startup. She is also experienced in permitting, preparation and certification of spill plans, preparation and certification of storm water pollution prevention plans, site remediation feasibility studies, and air emissions inventories. Ms. Watkins has conducted a number of treatability studies and designed wastewater treatment systems for metals removal. Treatment processes have included reduction, precipitation, clarification, filtration, ultrafiltration, membrane, ion exchange, and evaporation.

## *5.0 COMMUNITY RELATIONS SUPPORT*

As requested by the U.S. EPA, Respondent will provide assistance in preparing and in disseminating information to the public on progress of the RD.

# Remedial Design for Operable Unit No. 1 Field Sampling and Analyses Plan

# at

# Woolfolk Chemical Works Superfund Site Fort Valley, Georgia

**Revision Number: 0**

August 1994

*Prepared by:*

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List of Figures iii
List of Tables iv

1.0 INTRODUCTION . . . . . 1-1

2.0 GROUND WATER MONITORING WELLS . . . . . 2-1
2.1 NUMBER AND PROPOSED LOCATIONS . . . . . 2-1
2.2 WELL INSTALLATION AND CONSTRUCTION . . . . . 2-1
2.3 GEOLOGIC SAMPLING . . . . . 2-4
2.4 WELL DEVELOPMENT . . . . . 2-5
2.5 WATER-LEVEL ELEVATION MEASUREMENTS . . . . . 2-6
2.6 GROUND WATER QUALITY SAMPLING . . . . . 2-7

3.0 SAMPLING PROCEDURES . . . . . 3-1
3.1 GROUND WATER SAMPLES . . . . . 3-1
3.1.1 Water Level Measurements . . . . . 3-1
3.1.2 Well Purging Procedures . . . . . 3-2
3.1.3 Sample Collection Procedures . . . . . 3-3
3.1.4 Sample Volumes and Containers . . . . . 3-4
3.1.5 Sample Preservation and Handling Procedures . . . . . 3-4
3.1.6 Holding Times . . . . . 3-5
3.2 FIELD QUALITY CONTROL SAMPLES . . . . . 3-5
3.2.1 Ground Water Sampling . . . . . 3-5
3.2.1.1 Duplicate Samples . . . . . 3-5
3.2.1.2 Field Blanks . . . . . 3-5
3.2.1.3 Trip Blanks . . . . . 3-6
3.2.1.4 Equipment Rinsate Samples . . . . . 3-6
3.2.2 Well Construction Materials . . . . . 3-6

4.0 FIELD RECORDS, SAMPLE CONTROL, AND DOCUMENT CONTROL . 4-1
4.1 GENERAL . . . . . 4-1
4.2 FIELD DOCUMENTATION . . . . . 4-1
4.3 SAMPLE IDENTIFICATION . . . . . 4-2
4.4 IDENTIFICATION OF PHYSICAL EVIDENCE . . . . . 4-3
4.5 SAMPLE MANAGEMENT AND CUSTODY . . . . . 4-3
4.5.1 Field Custody . . . . . 4-3
4.5.2 Transfer of Custody . . . . . 4-4
4.5.3 Sample Shipping . . . . . 4-4

5.0 DECONTAMINATION OF EQUIPMENT . . . . . 5-1
5.1 DRILLING EQUIPMENT . . . . . 5-1
5.2 NON-METAL SAMPLING EQUIPMENT . . . . . 5-1
5.3 METAL AND STAINLESS-STEEL SAMPLING EQUIPMENT . . . . 5-2

5.4 MONITORING WELL CONSTRUCTION MATERIALS ..... 5-3
5.5 MISCELLANEOUS EQUIPMENT ..... 5-3
5.6 DECONTAMINATION PAD ..... 5-3

6.0 INVESTIGATION-DERIVED WASTE ..... 6-1

## LIST OF FIGURES


| | |
|---|---|
| 2-1 | Typical Construction for Surfical Aquifer Monitoring Well |
| 2-2 | Typical Construction for Upper Cretaceous Water Table Aquifer Monitoring Well |
| 2-3 | Typical Construction for Upper Cretaceous Confined Aquifer Monitoring Well |

## LIST OF TABLES


| | |
|---|---|
| 2-1 | Summary of Sample Collection and Analyses to be Performed |
| 3-1 | Required Containers, Sample Volumes, Preservative Techniques, and Holding Times |

## *1.0 INTRODUCTION*

This Field Sampling and Analyses Plan (FSAP) has been prepared to establish standard operating and field quality control procedures to be used during the implementation of the Remedial Design (RD) at the Woolfolk Chemical Works Site (the Site) located in Fort Valley, Georgia. As detailed in the Work Plan (WP) for the RD, additional efforts will be undertaken at the Site to characterize the extent of contaminants in the ground water. These efforts will include determining ground water elevations at existing monitoring wells, sampling existing ground water monitoring wells, installing additional monitoring wells, and analyzing ground water samples for the presence of contaminants.

The field procedures to be utilized during the implementation of the Work Plan are in accordance with EPA Region IV Environmental compliance Branch. Standard Operating Procedures and Quality Assurance Manual (SOPQAM).

## *2.0 GROUND WATER MONITORING WELLS*

### *2.1 NUMBER AND PROPOSED LOCATIONS*

To Confirm baseline conditions, 13 existing monitoring wells will be sampled and analyzed for the parameters listed in Table 1-1 of the WP. In addition, the elevation of the ground water at all existing monitoring wells will be determined prior to and during operation of the extraction system. Based on the results of these activities the need to install additional wells at the Site will be evaluated. A revised sampling and Analysis Plan for ground water delineation will be submitted Should it be determined that additional wells are warranted, they will be installed using the methods described below. Until the Performance Standards Verification Plan is submitted and approved, the existing quarterly sampling program for two city wells and three Tuscaloosa monitoring wells will be continued.

### *2.2 WELL INSTALLATION AND CONSTRUCTION*

Drilling techniques and will construction will vary, based on the water-bearing unit being screened; however, all new monitoring well installations will be performed in accordance with Appendix E of the SOPQAM. The drill rig and all equipment used in the drilling process will be decontaminated before drilling each borehole to minimize the potential for cross contamination. The specific decontamination procedures are discussed in Section 5 of this FSAP. It is expected that the new wells to monitor the Surficial Aquifer will be completed to a depth of 50 feet. The new wells installed to monitor the Upper Cretaceous Water Table and Confined Aquifers will be completed to depths of approximately 120 feet and 150 feet, respectively.

The wells will be constructed using 2-inch-inner-diameter (ID) stainless-steel screens and casing. All screens will be wire-wrapped, 10-foot-long sections, with a slot size of 0.010 inches. All joints will be threaded, and if necessary, either Teflon tape or Teflon O-rings will be used to seal the joints. Each well will have a cap and plug of appropriate material. Centralizers will be used at appropriate intervals in the monitoring wells installed in Upper Cretaceous aquifers.

Silica sand filter packs will be installed to a minimum of 2 feet, but no more than 4 feet, above the top of the screen. The sand will be tremmied into place using potable water. Previous drilling activities at the site have shown that site conditions are such that unstable sands may collapse around the screens in deeper wells. If this occurs, the formational sands will replace the filter pack.

A seal of bentonite pellets at least two feet but no more than four feet thick will be installed above the filter pack. The pellets will be placed by pouring them down the annular space. After allowing the bentonite seal to hydrate for a minimum of 8 hours, the remaining annular space will be grouted to within 2 feet of the ground surface using an expansive cement grout composed of Type I portland cement and 2 percent bentonite powder. Any bentonite pellets located above the water table will be hydrated with five gallons of potable water.

A mild steel protective casing with locking cap or bolt-down manhole cover will be placed over each well into the grout. A concrete pad of the appropriate dimension (3 feet x 3 feet x 6 inches minimum) will be installed around the casing for protection. Each concrete pad will be mounded to effect surface drainage away from the well. A locking cap will be installed with each well.

Each well will have a permanent measurement reference point (MRP) marked on its stainless steel casing from which to measure the water level and total depth.

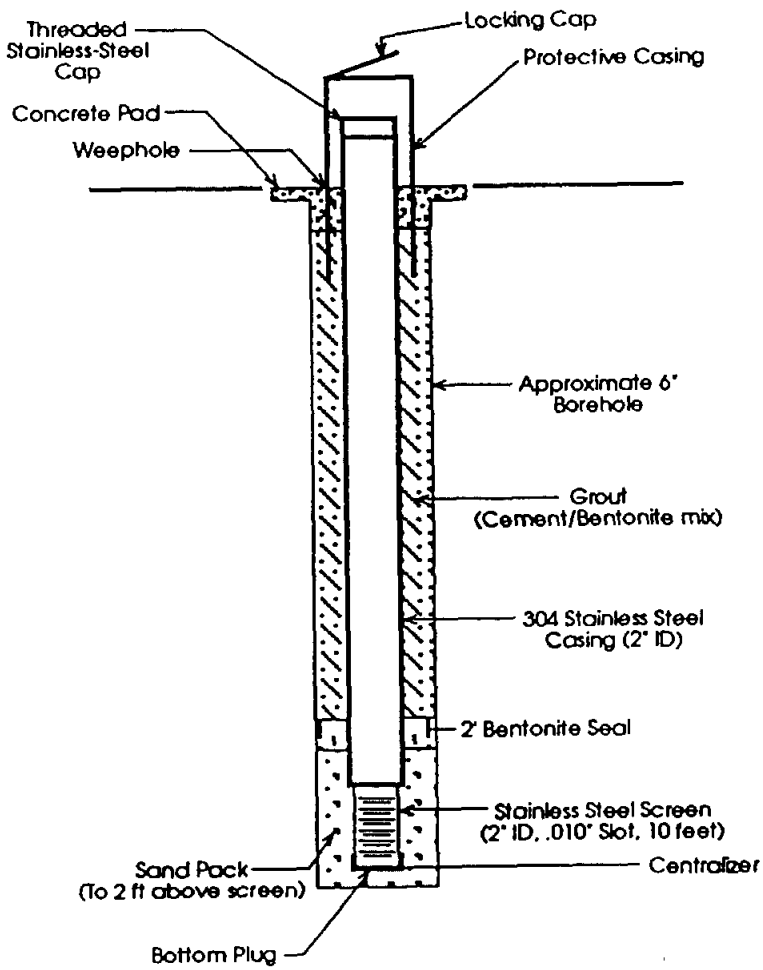
Upon completion of monitoring will installations the elevations of the MRP and ground surface will be determined for the newly installed wells to the nearest 0.01 foot. The MRP elevation will be determined relative to the National Geodetic Vertical Datum (NGVD) of 1929 by a surveyor licensed in the State of Georgia. The location of the well will also be determined by the surveyor.

Drill cutting and muds will be handled in accordance with the methods described in Section 6 of this FSAP. Installation requirements specific to particular hydrogeologic units are discussed below.

**Surficial Aquifer.** The borehole for the monitoring wells to be installed in the Surficial Aquifer will be drilled using 4.25-inch-ID hollow-stem auger drilling methods in accordance with the SOPQAM. These wells will be single-cased at the bottom of the aquifer. A schematic construction diagram of a typical Surficial Aquifer monitoring well is presented on Figure 2-1.

**Upper Cretaceous Aquifers.** All wells into the Upper Cretaceous horizons will be drilled using mud-rotary methods. To minimize the potential for cross-contamination from overlying soils and the drilling mud, only potable water and a pure bentonite slurry will be used in accordance with the SOPQAM. The drilling mud will be kept at a consistency that is as thin as possible but still maintains an open, clear borehole.

Wells that will be installed into the Upper Cretaceous Water Table Aquifer will be double-cased. Surface casing of 6-inch-ID, schedule 40 PVC will be installed into an 11-inch borehole and will be set at least 5 feet into the top of the Surficial Perching Unit. The annular space surrounding the surface casing will be grouted to the land surface, and a grout plug with a minimum thickness of 6 inches will be placed at the base of the surface casing. The grout will be a mixture of Type I Portland cement and 2 percent bentonite. It shall be placed by the tremmie

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**TYPICAL CONSTRUCTION FOR SURFICIAL AQUIFER MONITORING WELL**
FSAP FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE
2-1

4401SAMW.DWG 08-09-94 AM 1=1 TTWK

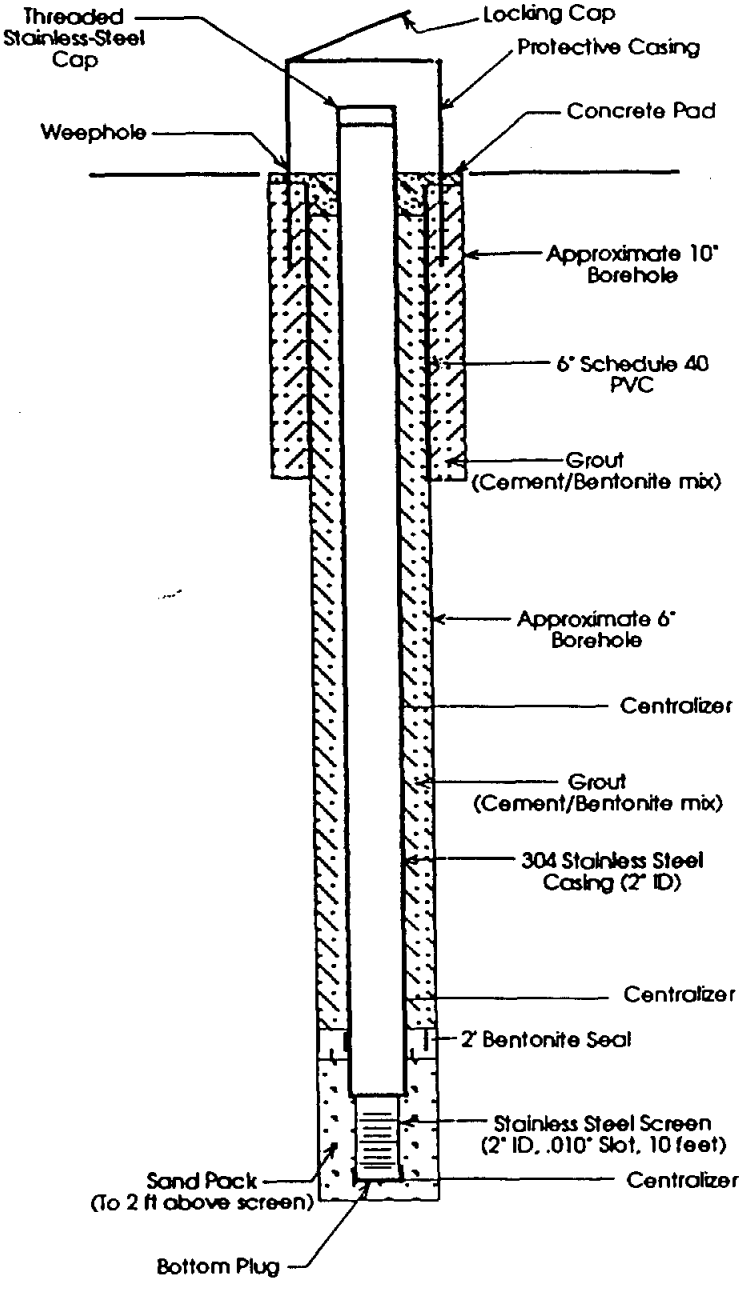
method. After allowing the surface-casing grout to set for a minimum of 24 hours, a 6-inch-diameter borehole will be advanced to the final depth of the well. A schematic construction diagram of a typical Upper Cretaceous Water Table monitoring well is shown on Figure 2-2.

The wells that will be installed into Upper Cretaceous Confined Aquifer will be triple-cased. The triple casing is considered necessary to prevent contamination near the water table from being carried downward into the confined aquifer as a result of well installation.

For all triple-cased wells, the outer casing will be installed at least 5 feet into the top of the Surficial Perching Unit and second casing will be installed at least 5 feet into the top of clayey and silty materials that form the basal confining unit of the Upper Cretaceous Water Table Aquifer. All boreholes to be drilled and all casing to be installed will have sufficient diameters to allow at least 2 inches of annulus around each casing for proper installation of annular materials. Other finishing details, such as the length of time required for grout to set and the use of a grout plug, are as described for the double-cased wells. A schematic construction diagram of a typical Upper Cretaceous Confined Aquifer Monitoring Well in shown on Figure 2-3.

## *2.3 GEOLOGIC SAMPLING*

Geologic samples will be collected from each borehole drilled as part of the monitoring well installation activities. These will be collected at depth intervals of five feet using a stainless steel split-spoon samples two feet in length. A qualified geologist will be on site during the sampling activities to log the samples and to monitor the drilling activities. The sample from each split-spoon sampler will be described as to its grain-size distribution, color, moisture, volume

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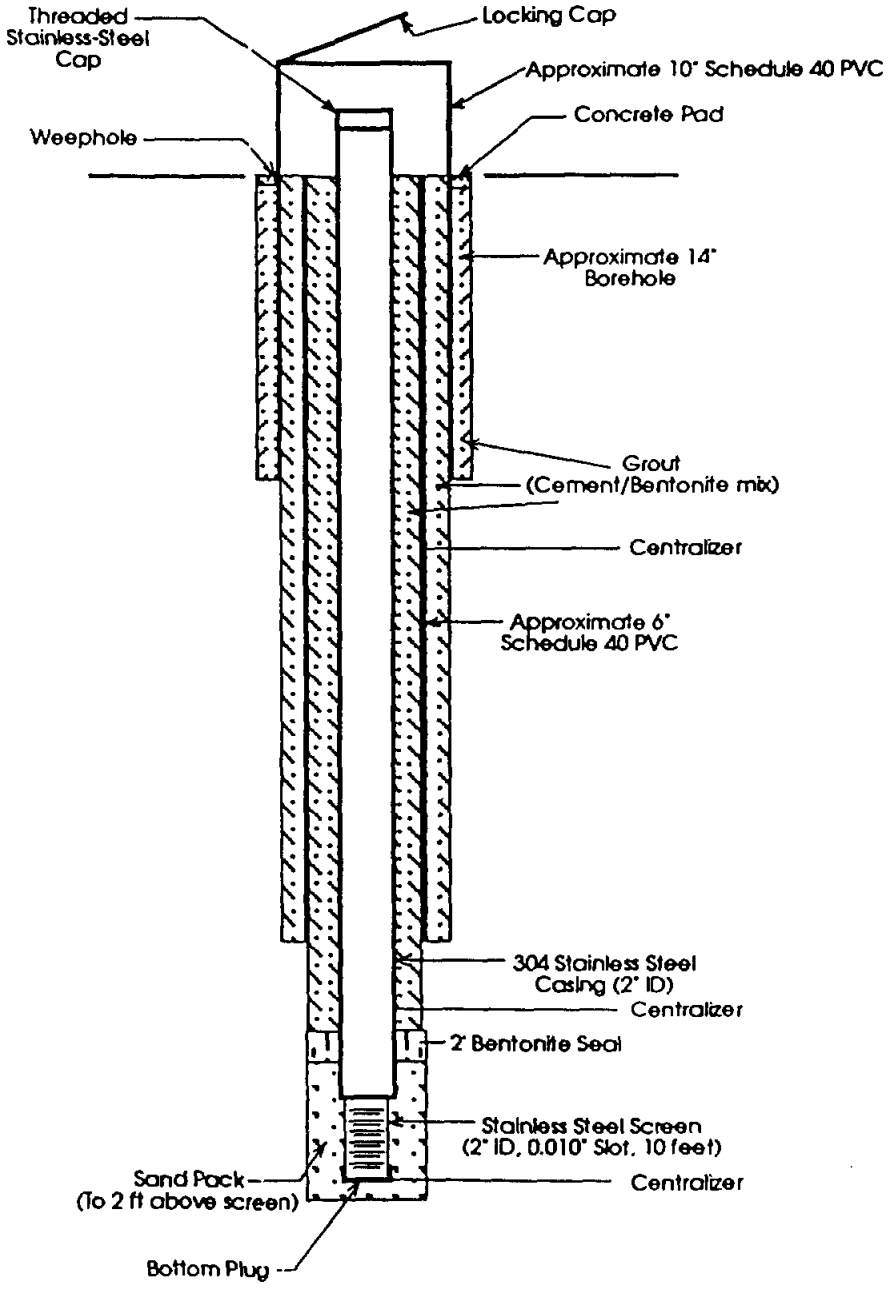
TYPICAL CONSTRUCTION FOR UPPER CRETACEOUS WATER TABLE AQUIFER MONITORING WELL
FSAP FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 2-2

4401UCCW.DWG 08-09-94 AM 1=1 TIWK

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**TYPICAL CONSTRUCTION FOR UPPER CRETACEOUS CONFINED AQUIFER MONITORING WELL**
FSAP FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE
2-3

4401UCCA.DWG 08-09-94 AM 1=1 TTWK

recovered, and other observable features. The descriptions will be recorded in a geologic log for the boring. If a well cluster is to be installed, geologic sampling of the deeper boring will not begin until the completion depth of the associated shallow boring has been passed.

## *2.4 WELL DEVELOPMENT*

All newly installed monitoring wells will be developed for a minimum of one hour, beginning no less than 24 hours after completion, and will not be sampled for a minimum of 24 hours after development. Development will be conducted in accordance with Appendix E.7 of the SOPQAM. Temperature, conductivity, and pH will be measured and recorded after the valuation of each well volume. Development will continue until these physical parameters stabilize and the water is free of fine-grained formation materials to the greatest extent practical.

The wells to be installed in the Surficial Aquifer will be developed using a combination surge block and air lift pump apparatus. The apparatus will be constructed of 5- and 10-foot PVC sections, with the bottom 1 foot fitted with two rubber packers and a checked valve at the bottom. A 1/4-inch air line will be fed into the pipe above the packers. At the surface, the PVC will be fitted with an elbow and discharge hose to direct flow away from the wells. Air will be supplied by a portable oilless compressor and pressurized air tank, with flow controlled by a pressure regulator.

This apparatus will be lowered into the screened zone and the wells will be surged by raising and lowering the apparatus approximately 3 to 5 feet, using even strokes. The upstroke will pull sediment into the wells, whereas the downward stroke will cause backwash through the screen, flushing the screen and sand-pack. After the wells have seen surged for 5 to 10 minutes, air will be injected at a

controlled rate and pressure to the bottom of the apparatus. As the air bubbles rise up through the inside of the PVC, they will carry water and sediment above them and eject the materials through the discharge tube. The discharge will be monitored to determine the clarity of the purge water. The check valve will prevent backflow of air into the wells and will enhance the efficiency of the surge cycle upstroke. Development water will be handled in accordance with the methods described in Section 6, below.

Deeper wells, which will be installed using drilling muds will also be developed using the combination surge block and air lifting methods. If the formational water does not appear to be clearing after purging five well volumes because of the residual drilling muds, the field geologist will consult with the Project Hydrogeologist to determine which alternate development method should be implemented.

## 2.5 *WATER-LEVEL ELEVATION MEASUREMENTS*

Prior to the installation of any additional ground water monitoring wells at the Site, the elevation of the ground water in each existing monitoring will be determined. This will include using an electronic water level tape and the methods described in Section 3.1.1 of this FSAP to determine the depth to ground water in each well. The tape will be marked at intervals of 0.01 foot. The depth to ground water measurements will be made from the surveyed MRP at each well. These measurements in conjunction with each wells MRP elevation will be used to calculate the elevation of the ground water at each well.

Following the completion of the depth to ground water measurements and calculation of ground water elevations, water table and potentiometric surface elevation maps for the Site will be prepared. Based on these maps and a

consideration of the results of the analyses performed on ground water samples collected from existing monitoring wells (See Section 2.4.2 of the WP), modifications to the proposed locations of the new monitoring wells wills be made as necessary.

Subsequent to the installation and development of the new monitoring wells, a second complete round of depth to water table measurements and elevation calculations will be made. These measurements will also be made at individual wells prior to sampling. As part of the measurement activities, the water level probe will be decontaminated between each well as detailed in Section 5 of this FSAP.

## *2.6 GROUND WATER QUALITY SAMPLING*

Table 2-1 provides a summary of all ground water and associated QA/QC samples to be collected during the RD. Ground Water samples will be collected from selected existing monitoring wells as well as all monitoring wells installed as part of the RD. Each ground water sample will be analyzed for the constituents listed in Table 1-1 of the WP. Sampling procedures are detailed in Section 3 of this FSAP.

# TABLE 2-1
# SUMMARY OF SAMPLE COLLECTION AND ANALYSES TO BE PERFORMED

## Woolfolk Chemical Works Site RD/RA

| Analyses | Ground Water Samples to be Collected | Field Blank | Trip Blank | Duplicate | Rinseate Blank | MS/MSD |
|---|---|---|---|---|---|---|
| VOCs | 13+ | 1/20 samples | 1/shipment | 1/20 samples | 1/day/equipment type | 1/20 Samples (Triple Volume Required) |
| SVOCs | 13+ | 1/20 samples | N/A | 1/20 samples | 1/day/equipment type | 1/20 Samples (Double Volume Required) |
| TAL Inorganics | 13+ | 1/20 samples | N/A | 1/20 samples | 1/day/equipment type | 1/20 Samples (Double Volume required) |
| Pesticides | 13+ | 1/20 samples | N/A | 1/20 samples | 1/day/equipment type | 1/20 Samples (Tripe Volume Required) |

## *3.0 SAMPLING PROCEDURES*

## *3.1 GROUND WATER SAMPLES*

### *3.1.1 Water Level Measurements*

Prior to the start of any ground water sampling activities, the depth to ground water in the wells to be sampled will be determined. In addition, the total depth of the wells will also be measured. These measurements will be made using the following procedure:

- Remove the lock from the locking cap covering the well.
- Lower the decontaminated electronic water-level probe to the water surface.
- Record the distance from the MRP to the water surface, rounding to the nearest 0.01 foot.
- Continue lowering the probe until it reaches the bottom of the monitoring well. Record the distance form the MRP to the bottom of the well, rounding to the nearest 0.01 foot.
- Remove the probe, cleaning the probe and measuring tape as it is brought to the surface.
- Obtain <u>all</u> monitoring well water-level measurements <u>before</u> purging and sampling any well. This avoids potential changes in water levels resulting from purging another well in the monitoring network.

Depth to water, depth of well and, top-of-casing elevation, along with date, time, and sampling personnel, will be recorded on a field log sheet and in the field logbook for each sample location.

### *3.1.2 Well Purging Procedures*

Prior to the start of the sampling activities, new, clean plastic sheeting will be place on the ground around the monitoring well to ensure a clean work area. After determining the depth to ground water and total depth of the wells to be sampled, the volume of water in each will be calculated using the following equation:

$$v = 0.041 d^2 h$$

Where: $v$ = volume of water in the well (gal)

$d$ = diameter of the well (inches)

$h$ = height of the water column in the well (feet)

Once the volume of water in the well is known, the well will be purged using a clean, decontaminated, Teflon bailer or a submersible pump. Any equipment used for purging will be decontaminated before being used for sampling. A minimum of three well volumes will be purged. Temperature, specific conductivity, and pH will be measured after the evacuation of each well volume. A well will be considered purged once a minimum of three well volumes have been evacuated and the temperature, specific conductivity, and pH measurements have stabilized within 10 percent for three consecutive readings. Procedures for calibration of field equipment used to measure water-quality parameters are included in the Quality Assurance Project Plan (QAPP).

Wells that are bailed or pumped dry during purging operations will be allowed to recover before sampling. Once the well recovers a minimum of 90 percent of the initial water level, the well will be considered adequately purged and ready for sampling. Purging data will be recorded on a field log sheet and in the field logbook.

### *3.1.3 Sample Collection Procedures*

After each well has been properly purged, samplers will change gloves and begin sample collection activities. Decontaminated, Teflon bailers will be used to collect the samples. Care will be taken to avoid contact with the interior of the sample container or lid. VOC samples will be collected first in order to minimize potential loss of volatile compounds to the air. These samples will be collected with a minimum of turbulence, and the sample containers will be filled completely with a positive (convex) meniscus to prevent the development of air bubbles within the sample container when capping. After collecting of the VOC fractions, the remaining fractions will be collected in the following order: SVOCs, pesticides, and inorganics.

Each sample container will be labeled with a sample designation, date and time (military time) sampled, and sampling personnel as described in the QAPP. Sample collection data will be recorded in the field notebook, and each sample will be recorded on a chain-of-custody form. Samples will then be stored in coolers packed with ice and prepared the same day for overnight shipment to the laboratory.

### *3.1.4 Sample Volumes and Containers*

Appropriate volumes of each sample fraction will be collected directly from the bailer into the appropriate sample container(s), as specified in Table 3-1. Samples analyzed for organic compounds will be collected into glass bottles with Teflon-lined lids. Water samples being analyzed for inorganics will be collected into polyethylene bottles. The bottles will be cleaned and prepared by the Contract Laboratory Program (CLP) approved laboratory using the standard CLP procedures and protocols before shipment to the Site.

### *3.1.5 Sample Preservation and Handling Procedures*

In the time between sample collection and laboratory analysis, the concentration and distribution of constituents in the sample could be altered by contamination, reaction, degradation, volatilization, sorption, and other processes. Sampling and handling procedures specify the type of container to use for specific analyses, proper temperature control, pH control, chemical addition to minimize changes in the concentration or distribution of constituents, and maximum acceptable sample holding times between collection and analysis. The required containers and preservation techniques for appropriate chemical analysis are summarized in Table 3-1. The preservation techniques will include the following:

- Samples collected for metals analyses will be field preserved to a pH of less than 2 using 50 percent nitric acid.

- Samples collected for VOC analysis will be placed into two laboratory-prepared vials to which four drops of 1:1 hydrochloric acid (HCL) have been added. A third vial that does not contain HCL will also be filled.

## TABLE 3-1
## REQUIRED CONTAINERS, SAMPLE VOLUMES PRESERVATIVE TECHNIQUES, AND HOLDING TIMES

### Woolfolk Chemical Works Site RD/RA

| Samples | Analysis | Maximum Holding Time | Bottle | Preservative | Required Amount |
|---|---|---|---|---|---|
| Ground water | TAL Metals | 6 months | 1 1-liter polyethylene | $HNO_3$ to pH <2, Iced to 4°C | Filled shoulder |
| | VOCs | 14 days | 2 40-ml glass vials w/Teflon septa | 2-HCL 1-unpreserved Iced to 4°C | Full with no void space |
| | SVOCs | Extract w/in 10 days, analyze w/in 40 days | 3 1-liter amber glass w/Teflon-lined lid | Iced to 4°C | Fill to shoulder |
| | Pesticides | Extract w/in 5 days, analyze w/in 40 days | 4 liter amber glass w/Teflon-lined top | Iced to 4°C | Fill to shoulder |

- All samples will be stored and shipped in coolers packed with ice to maintain a temperature of 4°C.

### *3.1.6 Holding Times*

Holding times for appropriate chemical analysis are summarized in Table 3-1. All water samples will be shipped within 24 hours of collection by overnight express delivery so they will reach the laboratory within the specified holding times.

## *3.2 FIELD QUALITY CONTROL SAMPLES*

### *3.2.1 Ground Water Sampling*

#### *3.2.1.1 Duplicate Samples*

Duplicate samples will be collected on 5 percent of the ground water samples. The samples will be labeled in such a manner that the CLP-approved laboratory will not be able to determine that it is a duplicate

#### *3.2.1.2 Field Blanks*

Field blanks will consist of using organic-free water brought to the Site in sealed containers and poured into sample containers during regular sampling activities. This type of sample will be collected once for each day during which samples are collected for laboratory analysis.

#### 3.2.1.3 *Trip Blanks*

Trip blanks will consist of three 40-ml vials filled with Type II reagent-grade water. The trip blanks will be prepared by the CLP-approved laboratory and will be treated as analytical samples. The trip blanks will accompany the sample containers as they are shipped from the laboratory and will accompany the samples as they are shipped back to the laboratory for analysis. One trip blank will be submitted with each day's samples that are shipped to be analyzed for VOCs. Trip blanks will be analyzed for purgeable hydrocarbons.

#### 3.2.1.4 *Equipment Rinsate Samples*

Equipment rinsate samples are collected to confirm that non-dedicated sampling equipment has been effectively cleaned. These sample will be collected by pouring deionized water through or over the cleaned device into the sample bottle(s) and will be submitted to the laboratory for analysis. One equipment rinsate sample will be collected and submitted for each piece of sampling equipment used on each day ground water sampling.

### 3.2.2 ***Well Construction Materials***

As a well construction QA/QC measure, one sample will be collected from each of the following well construction media:

- Drilling mud slurry
- Water from the municipal water supply used in preparing the mud slurry and transported in a water truck.

- Sand pack
- Portland cement
- Bentonite used in seals and grout

If a product brand changes during installation activities, one QA/QC sample will be collected of the new product.

## *4.0 FIELD RECORDS, SAMPLE CONTROL, AND DOCUMENT CONTROL*

### *4.1 GENERAL*

All sample identification, field records, and chain-of-custody records will be recorded in waterproof, non-erasable ink. If errors are made in any of these documents, corrections will be made by crossing a single line through the error and entering the correct information. All corrections will be initiated and dated by the investigator. Whenever possible, corrections will be made by the individual making the error.

Stick-on labels placed on sample bottles will be nonremovable. Labels will not be placed over previously recorded information. Corrections in information recorded on stick-on labels will be made as stated in the previous paragraph. Any methodologies pertaining to sample control, field records, and document control not specifically addressed herein will be performed in accordance with Section 3 of the SOPQAM.

### *4.2 FIELD DOCUMENTATION*

All sample designations and locations, as well as field measurements, will be recorded (in non-erasable ink) in bound field logbooks. Additional items to be included in the field logbooks will include, but not be limited to:

- Equipment calibration
- Nature of the sampling event
- Sampling location
- Types of samples collected
- Parameter(s) to be analyzed

- Type of QC sample(s) collected
- Type and number of sample containers used
- Preservation techniques
- Sampling procedures
- Chain-of custody information
- Sample packing, handling, and shipment information

All blank pages will be marked as "not used" as they are encounter. Each page in the field logbook will be dated and signed by the person responsible for keeping notes on the page.

## *4.3 SAMPLE IDENTIFICATION*

Samples, other than those collected for in-situ field measurements or analyses, will be identified by using a standard labels which will be attached to the sample container. The following information will be included on the sample label:

- Client/project name
- Sample identification
- Location
- Date and time of sample collection
- Signature(s) of sampler(s)
- Whether sample is preserved or unpreserved
- Analysis

An example of a sample label is shown as Figure 5-2 of the QAPP.

## 4.4 *IDENTIFICATION OF PHYSICAL EVIDENCE*

Output from analytical equipment or records, such as data loggers, will be marked in the field with the following information:

- Initials of field investigator(s)
- Start and end time(s) and date(s) for the chart
- Calibration measurements, if any
- Description of the location being monitored and any other information required to interpret the data, such as type of flow device, chart units, factors.

Documents such as technical reports and laboratory reports will be marked with the field investigator's signature, the date, the number of pages, and from whom they were received.

## 4.5 *SAMPLE MANAGEMENT AND CUSTODY*

### 4.5.1 *Field Custody*

Sample custody in the field will be retained by the sampling team member(s) who collected the samples. The samples remain in custody while they are in possession or in view, when they are placed in a secure area, and while they are in a designated secure area.

### 4.5.2 *Transfer of Custody*

Chain-of-custody forms will be filled out and signed by the sampling team member(s) who collected the sample whenever custody is transferred to another sampling team member, a project team member, or a shipping company. The individual who receives the sample also will sign and date the form.

Subsequent transfers will follow these same procedures. In the case of custody transfer to a shipping company, the bill of lading will be attached to the chain-of-custody form accompany the sample in lieu of a recipients signature. The original and one copy of the three-part form will accompany the sample, and one copy will be retained by Field Team Leader. The original record will be transmitted to the Field Team Leader after samples are accepted by the laboratory. This copy will become a part of the project file. A copy of the form is shown as Figure 5-1 of the QAPP.

### 4.5.3 *Sample Shipping*

Samples will be properly packaged for shipment and shipped to the designated laboratory for analyses. Shipping containers will be secured by using nylon strapping tape and custody seals. The custody seals will be placed on the containers so that they cannot be opened without breaking the seals. The seals will be signed and dated by the field investigator. An example of a custody seal is shown on Figure 5-2 of the QAPP.

The following procedure will be used to pack samples:

1. The sample container caps will be checked to determine that they are properly tightened.

2. Sample bottles will be placed in separate polyethylene bags and sealed.

3. The bottles will be placed in the cooler with sufficient space between the bottles for bubble wrap. "Blue ice" or ice that has been place in two plastic bags will be placed between or atop the samples.

4. Excess space in the cooler will be filled with bubbles wrap to ensure the samples cannot shift during shipment.

5. The chain-of-custody record will be placed in a plastic bag and taped to the inside lid of the cooler.

6. The cooler will be taped shut and custody seals will be affixed to the cooler.

7. The cooler will be shipped for next-day delivery via Federal Express to the designated laboratory.

## *5.0 DECONTAMINATION OF EQUIPMENT*

### *5.1 DRILLING EQUIPMENT*

All downhole drilling equipment will be cleaned with a high-pressure wash unit prior to being brought to the site. Any paint, rust build-up, hard or caked material that cannot be removed with the high-pressure wash will be removed by sand blasting prior to being brought to the site. Between each boring, the back of the drill rig and all downhole equipment will be cleaned with the high-pressure wash unit.

### *5.2 NON-METAL SAMPLING EQUIPMENT*

All non-metal field sampling equipment, including Teflon bailers, will be decontaminated according to the following procedures:

- Wash equipment thoroughly with phosphate-free laboratory detergent (e.g., Liquinox) and potable water using a brush and/or high-pressure steam cleaner to remove any particulate matter or surface film.

- Rinse equipment thoroughly with potable water.

- Rinse equipment with a 10 percent nitric acid solution (formulated from reagent-grade nitric acid and organic-free water).

- Rinse equipment twice with organic-free (e.g., Milli-Q) water.

- Rinse equipment twice with pesticide-grade isopropanol.

- Rinse equipment thoroughly with organic-free water.

- Allow equipment to air dry as long as possible.

- If storing equipment or transporting equipment via a route where contamination may occur, wrap equipment in one layer of aluminum foil, dull side in, and seal in plastic.

## *5.3 METAL AND STAINLESS-STEEL SAMPLING EQUIPMENT*

- Wash equipment thoroughly with phosphate-free laboratory detergent (e.g., Liquinox) and potable water using a brush and/or high-pressure steam cleaner to remove any particulate matter or surface film.

- Rinse equipment thoroughly with potable water.

- Rinse equipment thoroughly with organic-free water.

- Rinse equipment twice with pesticide-grade isopropanol.

- Rinse equipment thoroughly with organic-free water.

- Allow equipment to air dry as long as possible.

- If storing equipment or transporting equipment via a route where contamination may occur, wrap equipment in one layer of aluminum foil, dull side in, and seal in plastic; for large equipment that does not come in direct contact with samples, such as auger flights and drill rods, wrap in plastic only.

## 5.4 *MONITORING WELL CONSTRUCTION MATERIALS*

All materials used for construction of monitoring wells, including stainless-steel well casing and screen, centralizers, caps, etc., will be decontaminated as described in Section 5.3. An exception to this will be PVC surface casing and tremie pipe used for monitoring well installation, which will be steam cleaned prior to use. All well casing and screen, tremie tubing, surface casing, etc., that arrive on-site with printing and/or writing on them will be sanded or sandblasted until all writing and printing are removed.

## 5.5 *MISCELLANEOUS EQUIPMENT*

All other equipment, such as submersible pumps, tubing, etc., will be decontaminated according to the procedures given in Section E.9 and Appendix B of the SOPQAM.

## 5.6 *DECONTAMINATION PAD*

All decontamination will be performed on the existing decontamination pad.

## 6.0 *INVESTIGATION-DERIVED WASTE*

Both solid and liquid-phase investigation derived wastes (IDW) will be generated by the field investigation team. Materials which may become IDW, requiring proper containment and storage, are:

- Personnel protective equipment (PPE). This includes disposable cover-all, gloves, booties, respirator canisters, splash suits, etc.

- Disposable equipment (DE). This includes plastic ground and equipment covers, aluminum foil, Teflon tubing, broken or unused sample containers, sample container boxes, tape, etc.

- Soil cutting from drilling.

- Drilling mud or water used for mud-rotary drilling.

- Ground water obtained through well development or well purging.

- Decontamination fluids such as spent solvent and washwater.

All solid-phase IDW will be segregated according to waste type (soil, ground water, drilling mud, drill cuttings, PPE, etc.) and placed into DOT-approved 55-gallon drums. Each drum will be labeled as to its contents. Liquid-phase IDW will be placed into DOT-approved 55-gallon drums or into a water-tight storage tank. Filled drums and tanks will be transported to an IDW staging area. Up to 5 percent of the drums and the contents of the storage tank will be sampled to determine the proper method of disposal. The drum samples will be analyzed for RCRA characteristics and Toxicity Characteristic Leaching Procedure (TCLP).

Based on the results of these analyses, the IDW will be disposed of using appropriate procedures.

**Andco Environmental Processes, Inc.**
595 Commerce Drive,
Buffalo, New York 14228-2380
Tel: (716) 691-2100 • Fax: (716) 691-2880

July 26, 1994

ERM INC.
855 Springdale Drive
Exton, PA 19341

Attention: Ms. Deborah Watkins

Subject: **Treatability Study Information**

Dear Ms. Watkins:

Enclosed is an overview of our treatability study. It shows a step-by-step explanation of the treatability study including sample handling, the electrochemical process, filtration, chemical analysis, and the final report. Also, enclosed is a diagram giving the different treatment levels at varying pHs for each sample. If you have any questions, do not hesitate to contact me at (716) 691-2100.

Sincerely,

**ANDCO ENVIRONMENTAL PROCESSES, INC.**

Brian J. Seifert
Environmental Chemist

BJS/cs

**Andco Environmental Processes, Inc.**
595 Commerce Drive,
Buffalo, New York 14228-2380
Tel: (716) 691-2100 • Fax: (716) 691-2880

## ERM INCORPORATED TREATABILITY STUDY OVERVIEW

This treatability study will investigate the ability of the electrochemical technology to achieve adequate contaminant removal from groundwater. The proposed individual unit operations will be simulated in bench scale tests using actual water samples that have been properly collected and transported to our Amherst, New York facility. Because of arsenic, lead, cadimum, and mercury in this water, it will be necessary to adhere to standard procedures for sampling and containment of the water to be used for the treatability study, specifically, samples will be collected in clean, brown glass bottles. The samples should have zero head space and be chilled to 4°C. For the work described below, sample handling and laboratory protocol will adhere to solids waste manual SW-846 guidelines.

A. Chemical Analysis

Sample required - 3 gallons. In order to characterize the contaminants present in the wastewater stream, three one-gallon refrigerated samples will be supplied by ERM Incorporated in zero head space brown glass containers. The sample should be taken at a time during normal operation of the collection system in order to make sure that it is representative of typical groundwater. This representative sample will be analyzed for As, Pb, Cd, & Hg. If the above analysis shows additional contaminants not previously discussed and the requirement for additional treatment processes, it will be the basis for a revised scope and cost estimate for the treatability study.

B. Electrochemical Metals and Solids Removal

Tests to determine the optimal conditions for metals removal will be performed. The electrochemical test will be performed at 4 iron addition levels. For each iron addition level, the sample will be split and two or three pHs will be evaluated for clarification. The results of these tests will determine metals removal efficiency and the iron addition level required for optimal removal. The sludge settling characteristics for each sample will be observed for the flocculating polymer that is tested. Sludge weights will also be calculated as part of this phase of the test program. Because of the volume of water required to produce enough solids to perform a TCLP analysis, this will not be evaluated in the bench scale study.

C. Filtration

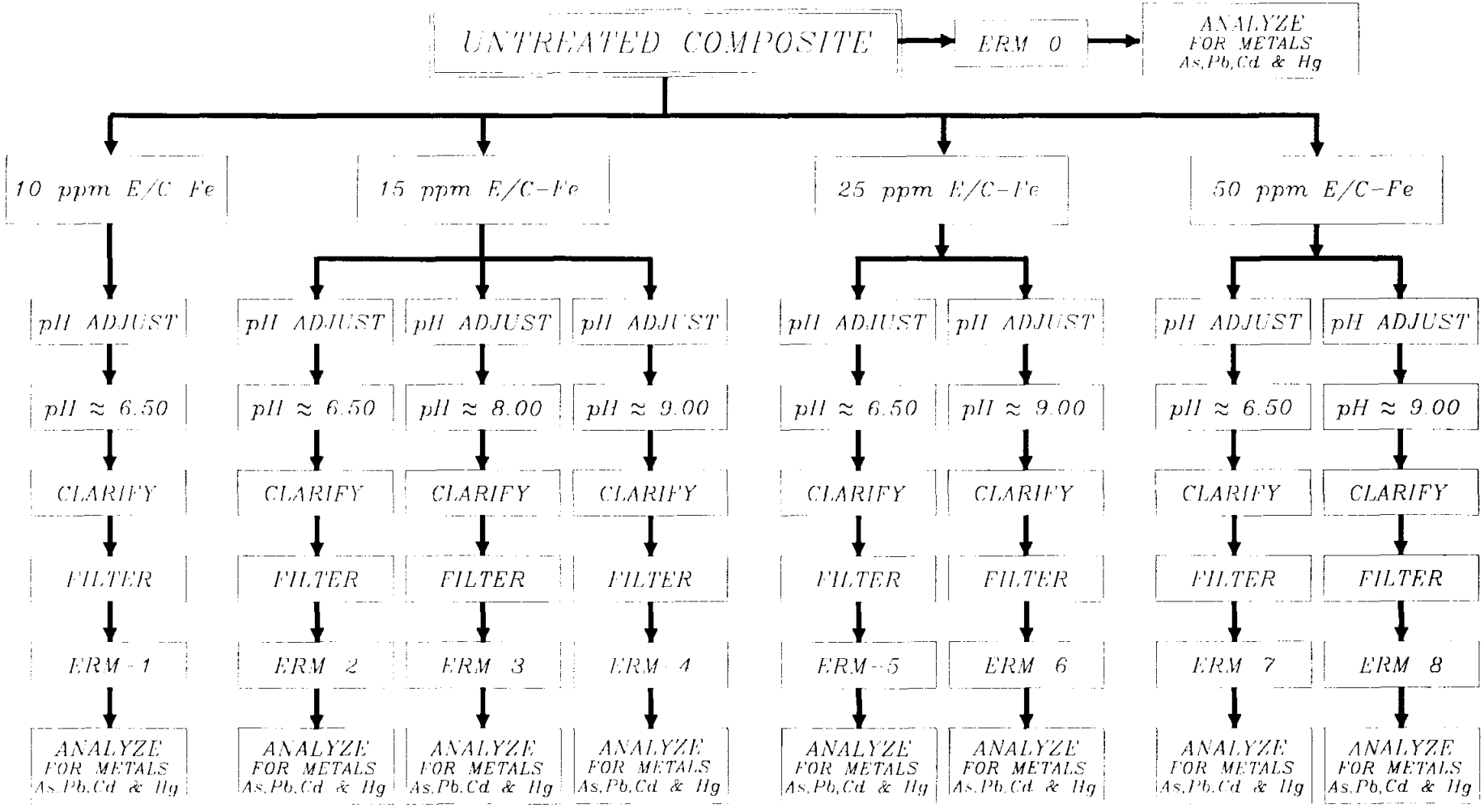
After the sludge settling step, filtration tests will be performed using Whatman #40 filter paper. In this manner, we can simulate the multi-media filtration step. After filtration, samples will be collected of both the sludge and the filtrate. The filtrate will be sent to an EPA certified lab for metals analyses. The collected sludge will be dried and weighed for sludge production calculations.

D. Report

In the report, all data gathered in the treatability study will be documented. The report will also document the performance of the electrochemical process in respect to anticipated discharge limits. The report will include a basic process flow diagram, expected operating costs, and characterization of treated wastewater stream. An engineering assessment of the treatment process and suggestions for any other treatment options as a result of the test program will also be part of the report.

SALES PFD_ETC\TESTCH2

# ELECTROCHEMICAL TESTS for ERM INCORPORATED




ANDCO
ENVIRONMENTAL
PROCESSES INC

FIGURE A

Date 7/25/94

**Andco Environmental Processes, Inc.**
595 Commerce Drive,
Buffalo, New York 14228-2380
Tel: (716) 691-2100 • Fax: (716) 691-2880

July 19, 1994

ERM INC.
855 Springdale Drive
Exton, PA 19341

Attention: Ms. Deborah Watkins

Subject: **Budget Pricing**

Dear Ms. Watkins:

Thank you for your continued interest in services and equipment supplied by Andco Environmental Processes, Inc. From our recent conversation, I understand that ERM has won another Superfund project (congratulations) and you require a heavy metal groundwater treatment system. The flow is 40 gallons/minute and require removal of the following: As influent (I) = 1960 ppb, effluent (E) = 30 ppb; Pb I = 28 ppb, E = Not required (NR); Cd I = 7 ppb, E = NR; Hg I = 11.8 ppb, E = NR. Andco's experience indicates that the electrochemical treatment system can obtain the following limits: As = <5 ppb, Pb = <5 ppb, Cd = <5 ppb, Hg = <2 ppb. The treatment system will consist of the following major components:

One (1) Influent tank

One (1) Electrochemical skid including:

- Process pump
- Control cabinet (for entire system)
- E/C cell

One (1) $H_2O_2$ Addition System

One (1) Cell cleaning system

One (1) Retention tank

One (1) pH adjustment tank with mixer

One (1) pH adjustment system

One (1) Clarifier

One (1) Multi-media filter system

One (1) Solids removal system (with filter press)

$200,000 verbal

The above equipment will be skid-mounted as much as possible. Monitoring and control will be through a programmable logic controller housed in a central control cabinet.

Andco performs treatability testing in our laboratory to guarantee treatment as well as determine system configuration, sizing, and to obtain operating costs. The cost for the testing is $600 plus analytical (at cost) and a 15% administrative charge on the analytical. A report will be issued approximately two weeks after receipt of the analytical results.

If you have any questions regarding this or any other project, please do not hesitate to contact the writer here at Andco.

Sincerely,

**ANDCO ENVIRONMENTAL PROCESSES, INC.**

Daniel F. Waytena
Sales Engineer

DFW/cs

enc. Process Flow Diagram
Analytical results from existing client

# ALLIED LABORATORIES, LTD.

PHONE 279-0390
AREA CODE 312

716 NORTH IOWA AVENUE VILLA PARK, ILLINOIS 60181

REPORT NO. 13284

## LABORATORY REPORT

DATE April 24, 1987

SAMPLE DESCRIPTION: Treated Wastewa

TO [redacted]
Chicago, IL 60628

Attn: [redacted]

RECEIVED:

| | 1/4/87 | 2/4/87 | 3/31/87 |
|---|---|---|---|
| pH | 7.6 | 7.8 | 7.6 |
| Total Chromium | <0.4 mg/l | <0.4 mg/l | <0.4 mg/l |
| Chromium (+6) | <0.4 mg/l | <0.4 mg/l | <0.4 mg/l |
| Iron | <0.5 mg/l | <0.5 mg/l | <0.5 mg/l |
| Total Dissolved Solids | 14,460 mg/l | 21,870 mg/l | 15,070 mg/l |
| Lead | <0.3 mg/l | <0.3 mg/l | <0.3 mg/l |
| Arsenic | 0.002 mg/l | <0.002 mg/l | 0.004 mg/l |
| Sodium | 1700 mg/l | 1700 mg/l | 1900 mg/l |
| Sulfate | 10,400 mg/l | 16,800 mg/l | 13,200 mg/l |

Irving I. Domsky
Laboratory Director

# ALLIED LABORATORIES, LTD.

PHONE 279-0390
AREA CODE 312

716 NORTH IOWA AVENUE VILLA PARK, ILLINOIS 60181

REPORT NO. 13272

## LABORATORY REPORT

DATE April 9, 1987

SAMPLE DESCRIPTION:

TO [redacted]
Chicago, IL 60628
Attn: [redacted]

RECEIVED:

| | 1/4/87 | 2/4/87 | 3/31/87 |
|---|---|---|---|
| pH | 8.8 | 8.9 | 8.9 |
| Total Dissolved Solids | 22,800 mg/l | 23,000 mg/l | 22,500 mg/l |
| Suspended Solids | 27,500 mg/l | 47,100 mg/l | 10,100 mg/l |
| Chromium (Total) | 325 mg/l | 300 mg/l | 250 mg/l |
| Chromium (Hexavalent) | 260 mg/l | 85 mg/l | 100 mg/l |
| Lead | <0.2 mg/l | <0.2 mg/l | <0.2 mg/l |
| Cadmium | <0.2 mg/l | <0.2 mg/l | <0.2 mg/l |
| Sodium | 1950 mg/l | 1500 mg/l | 1500 mg/l |
| Iron | <0.2 mg/l | <0.2 mg/l | <0.2 mg/l |
| Mercury | <0.01 mg/l | <0.01 mg/l | <0.01 mg/l |
| Barium | <10 mg/l | <10 mg/l | <10 mg/l |
| Arsenic | 10 mg/l | 17 mg/l | 0.25 mg/l |
| Sulfate | 20,100 mg/l | 9,800 mg/l | 20,100 mg/l |
| Phenols | ~~28~~ 260 mg/l | ~~25~~ 348 mg/l | ~~18~~ 217 mg/l |

Irving I. Domsky
Laboratory Director

10d-2000

# Alpha

## Analytical Laboratories, Inc.

860 Waugh Lane, H-1, Ukiah, California 95482

(707) 468-0401

Contamination of spent 100,000 gal to product out working process and re-injection

CLIENT [redacted]

ADDRESS [redacted]

Ukiah, CA 95482

| | |
|---|---|
| DATE COLLECTED | 11-5-84 |
| DATE IN LAB | 11-5-84 |
| COLLECTED BY | Alan |
| SAMPLE TYPE | water |

SET #1-RUSH BASIS

| LABORATORY NO.: | 4-3278 | 4-3279 | |
|---|---|---|---|
| CLIENT I.D. : | Sump #1 (Before) | Treated #2 (after treating) | |
| Copper | 1.1 | 0.12 | mg/l |
| Chromium, total | 8.8 | 0.02 | mg/l |
| Chromium, III | 2.0 | 0.02 | mg/l |
| Chromium, VI | 6.8 | <0.02 | mg/l |
| Arsenic | 0.77 | <0.004 | mg/l |

All elements reported as dissolved.

Alpha
Analytical Laboratories, Inc.

Emil Tirrula 11-6-84

LABORATORY DIRECTOR DATE

# Alpha

## Analytical Laboratories, Inc.

860 Waugh Lane, H-1, Ukiah, California 95482

(707) 468-0401

CLIENT [redacted]

ADDRESS [redacted]

Ukiah, CA 95482

DATE COLLECTED 11-6-84

DATE IN LAB 11-6-84

COLLECTED BY Alan

SAMPLE TYPE water

SET #2-RUSH BASIS

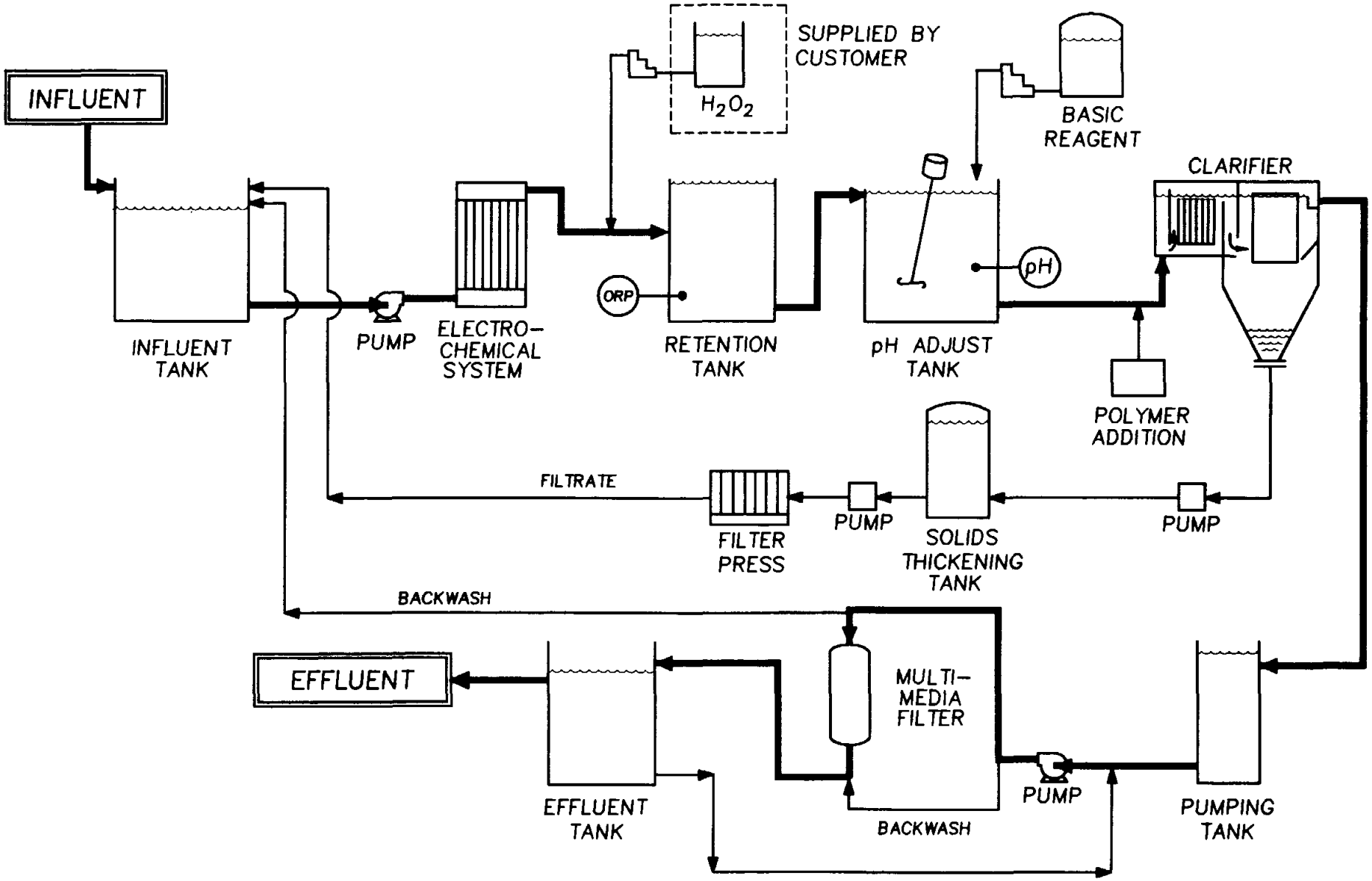
| LABORATORY NO.: | 4-3292 | 4-3293 | |
|---|---|---|---|
| CLIENT I.D. : | Sump #1 | Treated #2 | |
| Copper | 0.24 | 0.07 | mg/1 |
| Chromium, total | 172 | 0.02 | mg/1 |
| Chromium, III | 3 | 0.02 | mg/1 |
| Chromium, VI | 169 | <0.02 | mg/1 |
| Arsenic | 0.55 | <0.004 | mg/1 |

All elements reported as dissolved.

Alpha
Analytical Laboratories, Inc.

Emily Turnbull 11-6-84

LABORATORY DIRECTOR DATE




*PROCESS FLOW DIAGRAM*

ANDCO ENVIRONMENTAL PROCESSES, INC.
BUFFALO, NEW YORK

**Unocal**
Unocal Corporation
1511 East Orangethorpe Avenue
Fullerton, California 92631
Telephone (714) 525-9225
Facsimile (714) 525-5758

**UNOCAL 76**

July 20, 1994

Unipure

Ms. Debbie Watkins
The ERM Group
855 Springdale Drive
Exton, PA 19341

Dear Ms. Watkins:

As previously mentioned in our correspondence, in evaluating a project the Unipure technical staff normally conducts a Unipure Screen, a bench scale simulation of the Unipure Process, on a representative sample of the process stream or groundwater.

Attached is a copy of the Protocol for submitting a sample, including sample size, labeling, and shipping address.

The normal Screen procedure for a sample received without analytical information is as follows:

1. Analyze a sample for standard metals and any other special contaminates.

2. Review characterization and determine possible ferrous iron dosimetry.

3. Run Unipure Screen(s) using bench reactor for each schedule iron loading.

   A. Adjust pH to 7.5 - 8.

   B. Add Ferrous Iron (Typically as ferrous chloride) at Predetermined Dosimetry.

   C. Stir Sample (Hi Shear Mixer) & Sparge Air, (30 minutes).

   D. Settle & Filter (Run floc tests on side).

   E. Observe and Record Solids Characteristics and Volume.

   F. Analyze Filtrate For Metals Concentrations.

4. Analyze results and determine treatability. Were treatment goals achieved? Are added Screens with different iron loadings or a pretreatment step required?

Step 4 is a joint effort by the Technical Staff, the Process Engineering Group and the responsible Sales Manager. If treatability to the required level is obtained no effort at optimization is made at this time unless it is a specific requirement of the project.

Optimization is developed through further studies and field pilot tests.

I hope this information meets your present requirements. If you have any questions or need additional information, please let me know. I will try and supply it.

Sincerely yours,

John A. Schroth
Regional Sales Manager
Unipure Environmental

ERMEX2.JAS
cc: Mr. Michael McPhee, Unipure
Mr. Chuck Rueger, Design Equipment Systems

**Unocal**
Unocal Corporation
1511 East Orangethorpe Avenue
Fullerton, California 92631
Telephone (714) 525-9225
Facsimile (714) 525-5758

**UNOCAL 76**

July 19, 1994

Unipure

Ms. Debbie Watkins
The ERM Group
855 Springdale Drive
Exton, PA 19341

Dear Ms. Watkins:

Thank you for the opportunity to provide information and details regarding the Equipment, Technology and Services provided by UNIPURE Environmental.

As we have previously discussed, the Unipure Process utilizes the chemistry of iron in a unique process to remove soluble heavy metals from industrial waste streams and ground water applications. This process provides an effluent quality so much better than that obtainable with conventional treatment approaches that consistent compliance with the regulations set forth by the EPA, State and local authorities can be guaranteed.

The patented, UNIPURE Process Technology can be used over a wide range of flow rates as either the primary removal system or in a polish application. Equipment is sized based on wastestream flow rate and metals loading and is modularized for ease of installation and quality control. Batch treatment systems for smaller installations are also available.

Based on the information you supplied, I put together an information package for a constant flow, 40 gpm UNIPURE Heavy Metals Treatment System. The information package includes a budgetary capital investment figure, an equipment list, a process flow diagram, a process description, and a list of the Engineering Services that can be provided by Unipure.

Typically, the Unipure technical staff performs a Unipure Screen, a bench scale simulation of the UNIPURE Process, on a representative sample of the water to be treated. The results of those tests should demonstrate Unipure's metals reduction capabilities, and allow us to estimate operating parameters for a full scale system, refine this proposal and most importantly, provide the basis for a system performance guarantee.

Unipure also has pilot test units available to confirm laboratory results and optimize operating parameters in field trials prior to implementation of a full scale system.

I hope this information meets your present requirements. I will check with you in a few days after you have had a chance to review this information. In the meantime, if you have any questions or need additional information, please let me, Mr. Michael McPhee, or our representative in your area know. We will be happy to assist you. Mr. McPhee can be reached at (714) 447-5535.

Our representative is:

Design Equipment Company
2841 Egypt Road
Norristown, PA 19403
(215) 666-9770

Sincerely,

John A. Schroth
Regional Sales Manager
UNIPURE Environmental

ERMEX.JAS
cc: Mr. Michael McPhee, Unipure
Mr. Chuck Rueger, Design Equipment Co.

## UNIPURE HEAVY METALS REMOVAL TECHNOLOGY

UNIPURE Process Technology employs a unique mechanism for heavy metals removal. This technology represents a substantial improvement on classical iron based coprecipitation.

> UNIPURE iron based coprecipitation allows for dramatically increased heavy metals removal efficiency with a simultaneous reduction in sludge formation.

Heavy metals are trapped in an insoluble iron matrix. Entrapment occurs because heavy metals are coprecipitated when the iron is rapidly removed from the solution. In the UNIPURE process, classical coprecipitation is made more effective by associating the heavy metal with the iron molecules prior to coprecipitation. Heavy metals are associated with the iron in solution via an occlusion and adsorption type bonding. This creates a concentration or entropy effect that greatly enhances metals removal and also decreases iron requirements.

UNIPURE Process Technology allows the user to reduce the heavy metals concentrations to extremely low levels. It is common practice to exceed the EPA's primary and secondary drinking water standards for the regulated heavy metals. This coprecipitation of heavy metals is so effective, thermodynamic equilibrium laws are superseded. This is possible because UNIPURE relies on a kinetic process and, in fact, the reaction never reaches equilibrium. Therefore, the treated water can be treated repeatedly with additional heavy metals removal after every treatment. With UNIPURE it is possible to design wastewater treatment systems for any heavy metal removal standard. Current regulations for heavy metals removal do not require multiple UNIPURE treatments, but this ability will become important as regulations become more stringent.

## UNIPURE PROCESS TECHNOLOGY

Practice of the UNIPURE process requires three key elements:

1) A soluble ferrous iron source; either from spent pickling acids with high soluble iron or commodity chemicals such as ferrous chloride or ferrous sulfate.
2) An air source for oxidation.
3) A UNIPURE Reactor for implementation of the chemistry.

The proper implementation of the chemical reaction is critical for obtaining optimum heavy metals removal with minimum sludge formation. The UNIPURE Reactor series is designed specifically to provide the optimum conditions required to effect UNIPURE Technology under various maximum hydraulic flow conditions. Air is used as the oxidizer and this is supplied using a blower or utilizing plant air.

# UNIPURE BENEFITS

## COMPLIANCE

Unipure guarantees compliance with your heavy metals regulations.

## OPERATING COSTS

The operating pH of the UNIPURE system is 7.5 - 8.0 for all heavy metal containing streams. There is no need to raise the pH for precipitation and subsequently lower it for discharge. There is no need to spend money on additional chemicals for individual batch treatment of concentrates. Most concentrates are metered into the UNIPURE system with no separate treatment required.

The Unipure system employs traditional equipment and low cost commodity chemicals. Maintenance is relatively simple; no backwashing, regeneration or cleaning of expensive resins or membranes is required.

## SYSTEM FLEXIBILITY

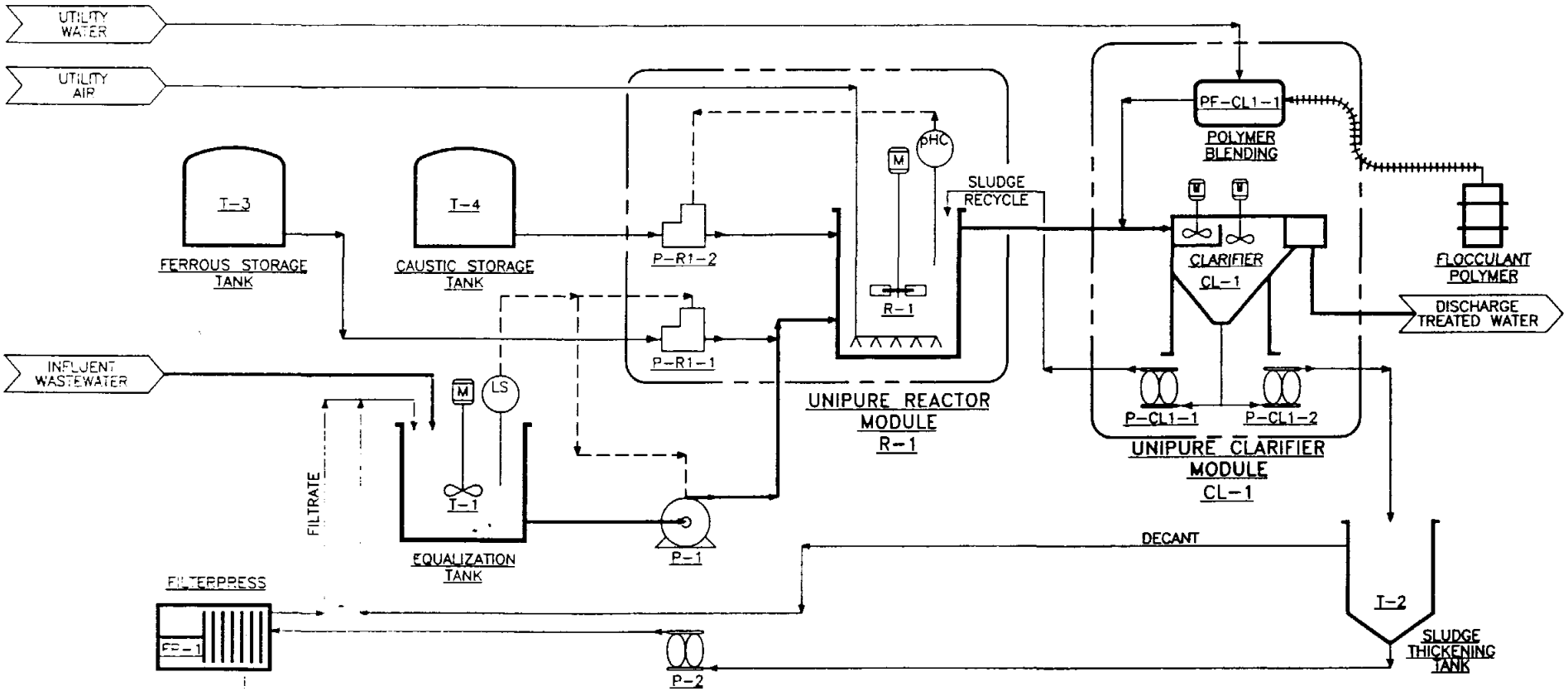
Fluctuations in pH do not adversely affect UNIPURE Process Technology as long as those fluctuations are between 7.0 and 11.0.

The inherent coagulating ability and quick settling properties of the Unipure sludge mean that upsets in clarification are less likely to occur.

Operation at neutral pH makes the process less susceptible to problems associated with chelating and complexing agents.

## MODULAR SYSTEM

Unipure offers a cost effective, modular system for implementing all phases of wastewater or groundwater treatment. We realize that the requirements of each customer are unique. The modular concept was adopted to ensure flexibility while meeting the individual needs of our clients. Equipment, engineering and construction costs are minimized with the modular concept.




*PROMOTIONAL MATERIALS ONLY*
*FOR INFORMATION SPECIFIC TO YOUR PROJECT, PLEASE CONTACT UNIPURE'S SALES DEPARTMENT (800) 323-8647*

| REV No | REV DATE | REVISION | REV BY | CHK BY | APPR BY |
|---|---|---|---|---|---|
| 2 | 9/11/91 | GENERAL REVISIONS | DLM | | |
| 1 | 5/6/91 | GENERAL REVISIONS | DLM | DGH | DGH |
| 0 | 2/13/91 | ORIGINAL DRAFT | DLM | DGH | DGH |

DR: DLM
DSGN: DGH
CK:
APPR:
DATE: 2-13-91
DWG. SCALE: NONE | PLT. SCALE: NONE
PROJ: 9000
SKID: NONE

UNOCAL-CONFIDENTIAL
NOT TO BE DISCLOSED, USED OR DUPLICATED EXCEPT AS AUTHORIZED IN WRITING BY UNION OIL COMPANY OF CALIFORNIA

CUSTOMER: UNIPURE

UNOCAL UNIPURE

TITLE: UNIPURE WASTEWATER TREATMENT SYSTEM STANDARD CONFIGURATION

DWG.# 9000-B-F-1

# UNIPURE PROCESS FLOW DESCRIPTION
# CONTINUOUS FLOW UNIPURE TREATMENT SYSTEM

## COLLECTION AND EQUALIZATION

An equalization tank is typically used to collect and homogenize the process wastewater. The water will then be pumped to the UNIPURE Reactor.

## FERROUS IRON ADDITION

A ferrous chloride or ferrous sulfate solution will be injected into the water prior to entering the UNIPURE Reactor. The ferrous addition system consists of a chemical storage tank or tote bins for the ferrous solution and a chemical injection pump which is supplied with the Reactor Module.

## METALS PRECIPITATION

The water containing ferrous iron and heavy metals will enter the UNIPURE Reactor. The pH in the Reactor will be maintained at 7.5 -8.0 using sodium hydroxide as the base. A chemical injection pump supplied with the Reactor Module will be used to deliver sodium hydroxide from the chemical storage tank or tote bins.

Air will be introduced into the Reactor using the specially designed air sparge system included with the Reactor. Air requirements will be minimal. If an air compressor and/or blower are not currently available, Unipure can supply either at additional cost.

The heavy metals will be precipitated in the UNIPURE Reactor using UNIPURE Process Technology. The solids laden water will flow by gravity to the UNIPURE Clarifier/Flocculator Module.

## FLOCCULATION/CLARIFICATION

The treated water will enter the flash mix chamber of the Clarifier/Flocculator Module where anionic polymer will be injected from the polymer addition system. The polymer will then react with the Unipure solids to form a large particle size in a slowly mixed flocculation chamber. The flocculated solids will enter the main body of the clarifier where they will settle to the bottom by gravity. The clean, clarified water will then be decanted to discharge.

Some of the solids collected in the bottom of the Clarifier/Flocculator will be transferred to the UNIPURE Reactor to aid in the treatment process. The remaining solids will be transferred to the sludge holding tank for thickening and subsequent feed to a filter press. All pumps required for the operation of the clarification step are included in the module.

## SLUDGE DEWATERING

Sludge collected in the sludge holding tank will be periodically sent to a recessed chamber filterpress for further dewatering. The solids content of the filter cake is projected to be 30% to 35%.

## ENGINEERING SERVICES

Detailed engineering services will be provided to ensure the successful implementation and start-up of the UNIPURE Treatment System.

The follow-up services will be provided to ensure the long-term efficient operation of the UNIPURE System.

### TYPICAL ENGINEERING SERVICES PROVIDED BY UNIPURE

PROCESS FLOW DIAGRAM

PROCESS & INSTRUMENTATION DIAGRAM

EQUIPMENT LAYOUT
- General Layout
- Tank Drawings
- Filterpress Data Sheets

ELECTRICAL
- Control Panel Drawing
- Specifications

MODULE DRAWINGS
- Reactor Package
- Clarifier Package
- O&M Manuals
- Specifications

PROCESS START-UP
- System operational check out
- Operator training

INSTALLATION
- Advice

PROJECT MANAGEMENT

### OPTIONAL SERVICES AVAILABLE

QUARTERLY SYSTEM EVALUATION & OPTIMIZATION

## BUDGETARY CAPITAL INVESTMENT
## 40 GPM UNIPURE TREATMENT SYSTEM

| | |
|---|---|
| UNIPURE EQUIPMENT AND TECHNICAL SERVICES . . . . . | $ 112,550 |
| OPTIONAL EQUIPMENT . . . . . | to be determined |

### SCOPE OF WORK

From the information generated by either laboratory testing, a pilot study or from your specifications UNIPURE will generate a final design package. This package will detail the Unipure supplied equipment and assist you or your client in the installation of the UNIPURE Treatment System.

After the successful installation and mechanical commissioning of the equipment, a Unipure Technical Support Representative will start-up the system and train the permanent operators. Four (4) days of on-site start-up and training services are included in the above quotation.

Notes:

1 The quote does not include pricing for materials or labor for any interconnecting piping or electrical wiring between modules or any stand alone components.

2 Freight charges and travel & living expenses for Unipure Field Personnel are not included in the above quote. Those charges will be billed separately at Unipure's current T&M schedule.

## EQUIPMENT DESCRIPTION/UNIPURE TREATMENT SYSTEM
## 40 GPM SYSTEM

UNIPURE REACTOR MODULE, R-2000

Includes:

**LICENSE AND COMPLIANCE GUARANTEE**
open top FRP tank
variable speed mixer
air sparge system with flow meter
pH probe and controller
ferrous injection pump
base injection pump
control panel
piping and valves (installed)
electrical controls and wiring (installed)

UNIPURE CLARIFIER MODULE, CL-60

Includes:

lamella type clarifier with removable FRP plates
coal tar epoxy coated steel
integrated flash mix/flocculation chambers
flash chamber mixer
flocculation chamber mixer
variable speed controller
polymer addition system
sludge recycle pump
sludge transfer pump
piping and valves (installed)
electrical controls and wiring (installed)

SLUDGE HOLDING TANK

XLPE, cone bottom, open top
with stand

FILTERPRESS (1.5 cu. ft.)

Includes:

filter press feed pump,
non-gasketed plates, air blow down manifold,
plate shifter, sludge bins

## EQUIPMENT DESCRIPTION/UNIPURE TREATMENT SYSTEM
## 40 GPM PROCESS CAPACITY

(continued)

EQUALIZATION TANK
Includes:
FRP tank, flat bottom, open top,
mixer, level controls, centrifugal
transfer pump

FILTRATE SUMP TANK
Includes:
XLPE tank, flat bottom, open top,
w/ level controls & transfer pump

TRANSFER PUMP
Centrifugal, 50 GPM @ 20' HD.

### OPTIONAL EQUIPMENT

(2) CHEMICAL STORAGE TANK(S)
XLPE tank
flat bottom, closed top

EFFLUENT FILTER SYSTEM
Multi-Media or Cartridge

# ESTIMATED OPERATING PARAMETERS

40 gpm, 24 hours per day

| | |
|---|---|
| Total Heavy Metals: 2.0 mg/l | pH:7 |

CHEMICAL USAGE:

| | |
|---|---|
| Caustic (50% NaOH) | 2.4 gpd |
| Iron (13% $FeCl_2$) | 9.6 gpd |
| Polymer (100%) | 0.3 gpd |
| Water | 200 gpd |

SOLIDS GENERATION: (10 ppm $T_{ss}$)

| | |
|---|---|
| Cake (35% Solids) | 1.3 cu. ft./day |

July 19, 1994

Wheelabrator Engineered Systems Inc.

**Memtek**

28 Cook Street
Billerica MA 01821
508/667-2828
Fax 508/667-1731

July 29, 1994

Mr. Jack Riggenbach
ERM Inc.
855 Springdale Drive
Exton, PA 19341

REFERENCE - B-062-9407-ET

Dear Mr. Riggenbach:

We are pleased to provide this budgetary proposal for a membrane filtration waste water treatment system to process contaminated ground water at the Clean Sites in Fort Valley, Georgia.

The proposed system will process 40 GPM of ground water to remove the following contaminants.

| METAL | RAW (ppb) | TREATED (ppb) |
|---|---|---|
| Arsenic | 1960 | < 30 |
| Lead | 24 | < 5 |
| Cadmium | 7 | < 5 |
| Mercury | 11.8 | < 5 |

Please note the treated effluent quantity will be guaranteed by Wheelabrator Memtek pending confirmation by treatability study. We recommend that the study be conducted at the Clean Sites facility. Wheelabrator will supply the equipment and chemist to operate the system. The fee for the study is $6,000.00. The study will require four (4) days at the site. Clean Sites or ERM must provide analytical services, chemicals, utilities and wastewater. A description of the treatability study format is attached.

Our preliminary design recommendation includes the following equipment and services:

| ITEM | MODEL | DESCRIPTION |
|---|---|---|
| 1. | EFC 2400 | Membrane Filtration System |
| 2. | RXP 1100 | Three Stage Reaction Design |
| 3. | PCP 250 | Two Powder Chemical Feed Systems |
| 4. | FP-4001 | Filter Press (4 cubic feet) auto pump controller, plate shifter, dumpster |
| 5. | ST 1000 | Sludge Collection Tank |
| 6. | NSP 1000 | Final pH Adjustment |

| ITEM | MODEL | DESCRIPTION |
|---|---|---|
| 7. | Installation Supervision | Four days on site |
| 8. | Startup | Four days on site |
| 9. | Operator Training | Four days on site |

Total budgetary price (ex works Billerica, MA) is $250,000.00.

The following are not included in the pricing:

1. Site preparation including a building to house the system.
2. Wastewater collection and feed system.
3. Equipment shipping costs.
4. Installation of equipment at the site.

Wheelabrator Memtek has extensive experience in applying membrane filtration technology to remove the above indicated metals down to low ppb levels. As part of the Wheelabrator organization, Wheelabrator Memtek can provide substantial credibility in meeting the performance objective for your client's project. Information on Wheelabrator is attached for your review.

Very truly yours,

Eugene P. Tinus INPT

Eugene P. Tinus
Regional Sales Manager
Southeast

Attachment(s)

cc: Debbie Watkins

**ON-SITE TESTING PROTOCOL**

**FOR GROUNDWATER TREATMENT AT FORT VALLEY, GA**

The purpose of this on-site treatability study is to evaluate and develop a waste treatment process to treat contaminated groundwater at Clean Sites in Fort Valley, Georgia.

*Application Description*

Based upon the nature of the groundwater and the required effluent quality for meeting stringent level of metal concentration, the membrane filtration and ion exchange is considered the most viable treatment process for detailed examination and evaluation in this treatability program.

A lab size membrane pilot unit, which is a small replica of the Memtek system and bench size ion exchange columns, will be used in this treatability study.

*Test Program*

The work to be conducted by Wheelabrator Memtek is designed to remove Arsenic, Lead, Cadmium, Mercury as the primary metal contaminants from polluted groundwater. The program consists of the following tasks:

- To establish an appropriate pretreatment process to convert the metals from their ionic form to precipitated solids.

  This beaker scale testing will apply pretreatment chemistries suitable for As,Pb,Cd,Hg precipitation.

- Process optimization.

  Confirmed and selected pretreatment procedure is further specified such as chemical dosage, pH value and needed process parameters.

- Flux performance test.

  This phase explores filtration rates for sizing of the filter system and system response to solid and chemical loading.

- Ion Exchange application.

  To verify feasibility of ion exchange to polish a microfiltration effluent, if needed.

- A treatability study report will be issued after completion of on site testing.

| MODEL NO. | # OF CHAMBERS | CUBIC FT. CAPACITY | DIMENSIONS (REF ONLY) | | | WEIGHTS (LBS) | |
|---|---|---|---|---|---|---|---|
| | | | A | B | C | EMPTY | FULL |
| EPG630/32-7 | 7 | 2.0 | 78 3/4' | 18' | 50 5/8' | 3,030 | 3,170 |
| EPG630/32-10 | 10 | 3.0 | 78 3/4' | 24 3/4' | 50 5/8' | 3,030 | 3,315 |
| EPG630/32-14 | 14 | 4.0 | 94 3/8' | 33 3/4' | 66 1/4' | 3,460 | 3,740 |
| EPG630/32-17 | 17 | 5.9 | 94 3/8' | 40 3/8' | 66 1/4' | 3,460 | 3,815 |
| EPG630/32-21 | 21 | 6.0 | 103 1/4' | 49 1/4' | 75 1/8' | 3,575 | 3,995 |
| EPG630/32-27 | 27 | 8.0 | 116 3/4' | 62 3/4' | 88 5/8' | 3,825 | 4,385 |
| EPG630/32-34 | 34 | 10.0 | 132 1/2' | 78 1/2' | 104 3/8' | 4,100 | 4,800 |

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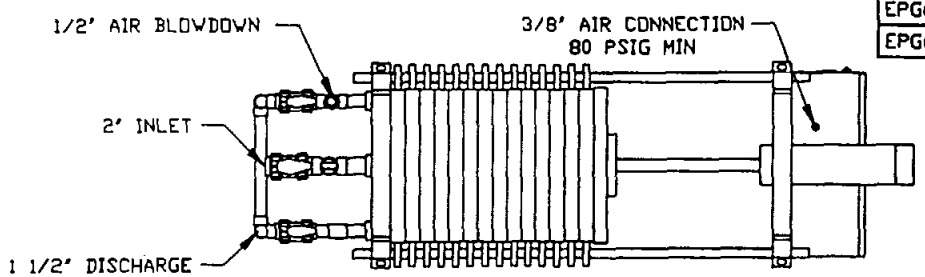


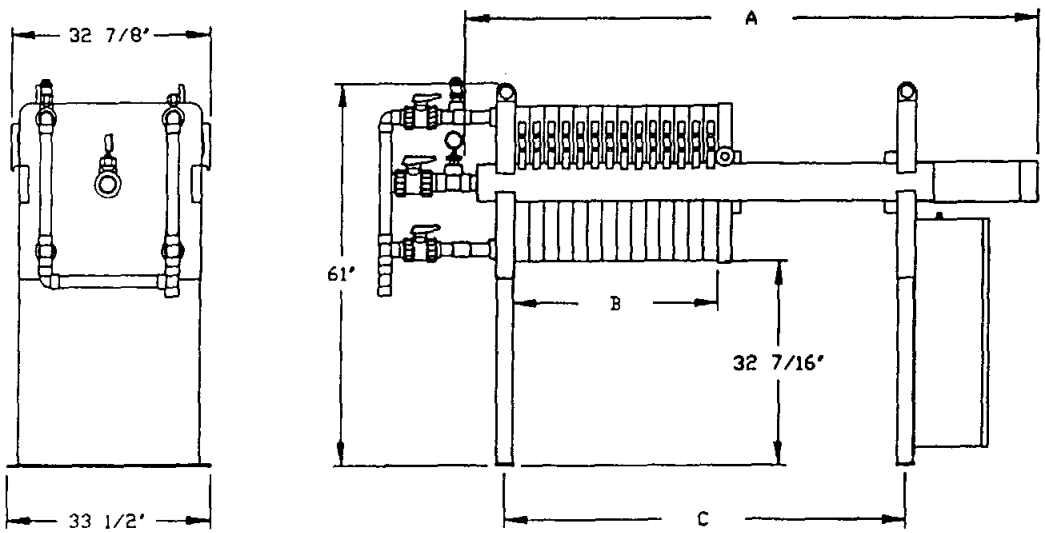


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DATE 5/13

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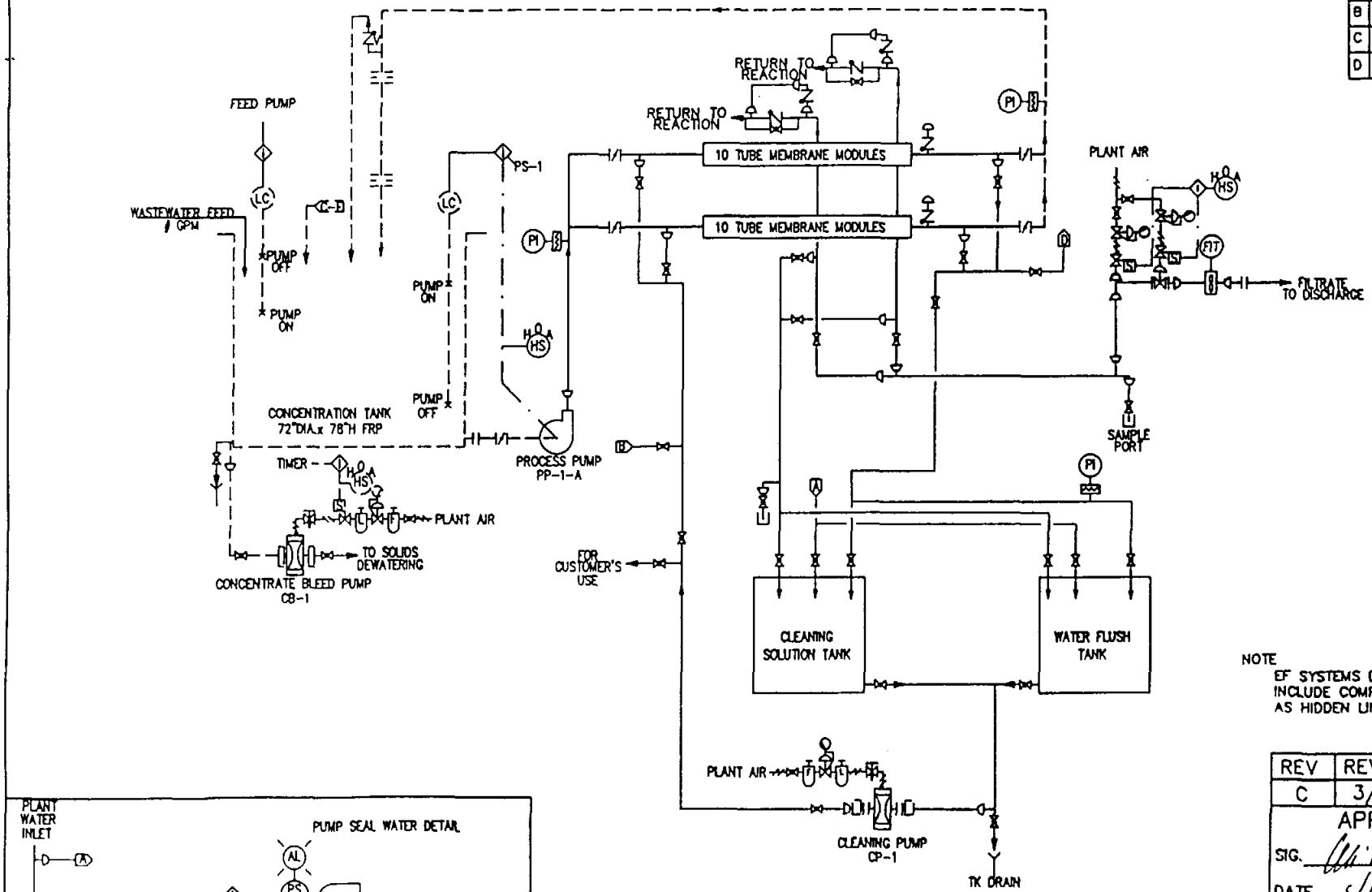
Wheelabrator Engineered Systems Inc. **Memtek**

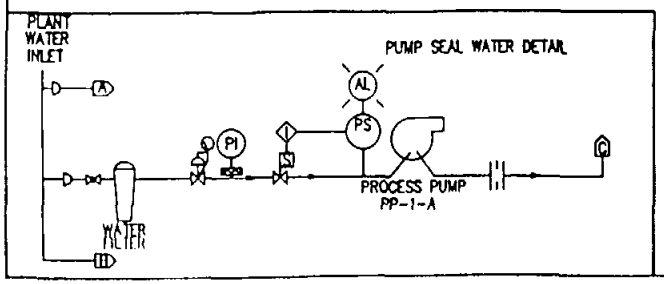
FILTER PRESS 630MM

4/7/94

| | FROM | TO |
|---|---|---|
| A | CITY WATER | CL/WF TKS |
| B | CITY WATER | CLEANING INLET |
| C | SEAL BLOCK | CONC. TK |
| D | WATER FLUSH RETURN | CONC. TK |




NOTE
EF SYSTEMS DO NOT INCLUDE COMPONENTS SHOWN AS HIDDEN LINES.

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EF/EFC2400 PROCESS DIAGRAM
9/6/91 PAGE 28

| POWER REQUIREMENTS | WATER REQUIREMENTS | AIR REQUIREMENTS |
|---|---|---|
| 460V,3Ø,60AMP | 40GPM @ 40PSI | 60CFM @ 100PSI |

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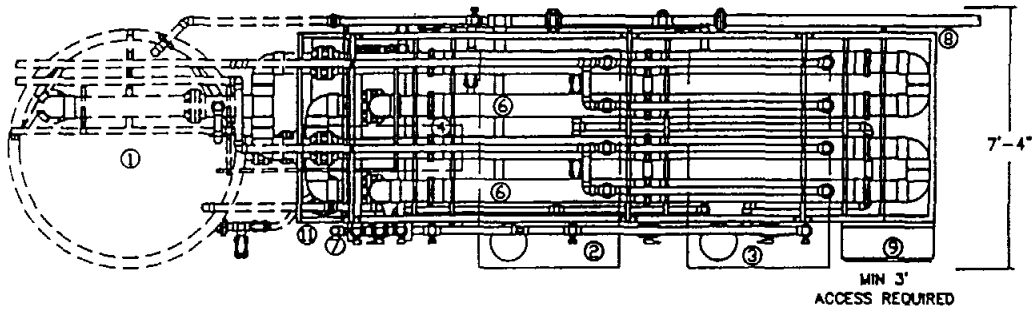
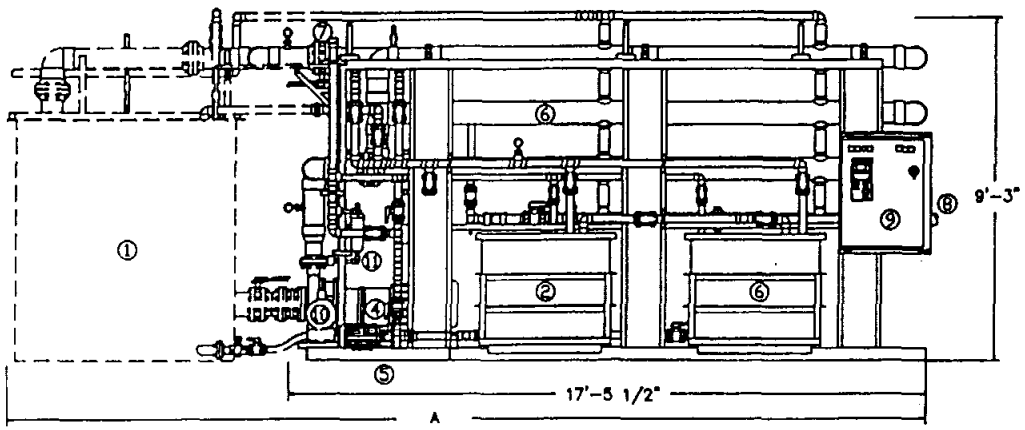



INDEX

1) CONCENTRATION TANK 1375 GAL (72x78) FRP
2) CLEANING TANK 300 GAL HDPE
3) WATER FLUSH TANK 300 GAL HDPE
4) PROCESS PUMP 30HP
5) CLEANING PUMP (AIR OPERATED)
6) 10 TUBE MEMBRANE MODULES (24)
7) CITY WATER FEED 2"
8) EFFLUENT DIACHARGE 3"
9) CONTROL PANEL
10) CONCENTRATE BLEED PUMP (AIR OPERATED)
11) PLANT AIR SUPPLY 1/2"

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OPTIONS

SINGLE PUMP A = 25'-4"
DUAL PUMP A = 27'-0"

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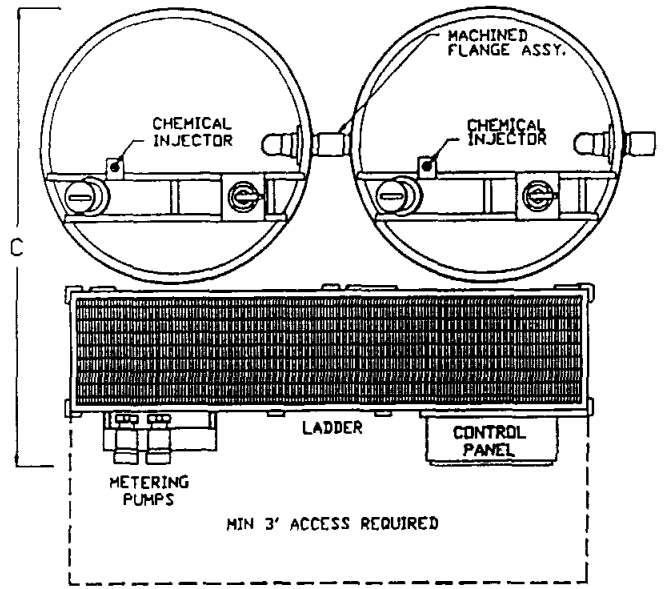
Wheelabrator Engineered Systems Inc. **Memtek**

EF/EFC2400 LAYOUT & ELEVATION
10/22/91

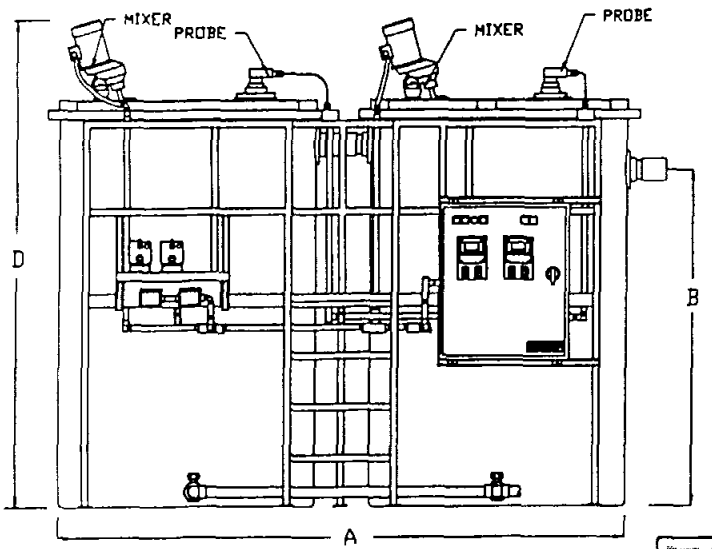



| MODEL # | MAX. RATED CAP.(GPM) | TANK SIZE | | | CONNECTIONS | | MIXER HP | POWER REQUIREMENTS | SYSTEM USED WITH | DIMENSIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | VOL. | DIA. | HGT | OUTLET | DRAIN | | | | A | B | C | D |
| RXP 250 | 20 | 250 | 42" | 48" | 3" | 2" | 1/4 | 460V,3Ø,15AMP | EFC400 | 107" | 41" | 70" | 71" |
| RXP 500 | 40 | 500 | 48" | 72" | 4" | 2" | 1/4 | 460V,3Ø,15AMP | EFC1200 | 113" | 60" | 94" | 95" |
| RXP 1100 | 90 | 1100 | 60" | 90" | 4" | 2" | 1/2 | 460V,3Ø,15AMP | EFC2400 | 139" | 74" | 106" | 113" |
| RXP 2000 | 160 | 2000 | 82" | 90" | 6" | 2" | 1 | 460V,3Ø,15AMP | EFC3600/4800 | 183" | 78" | 128" | 113" |

ALL DATA SUBJECT TO CHANGE

NOTES:

1) TANK MATERIAL HDPE.
   TANK COVER MATERIAL 1/2" POLYPRO.
2) EACH REACTION TANK SUPPLIED WITH ONE pH CONTROLLER/MONITOR AND ONE CHEMICAL METERING PUMP (ELECTRICAL OR AIR OPERATED).
3) ORP AND ADDITIONAL CHEMICAL FEED PUMP OPTIONAL.
4) CATWALK IS SUPPLIED ON RXP500 - RXP2000 ONLY.
5) EACH TANK IS SUPPLIED WITH ONE HEAVY DUTY GEAR DRIVEN MIXER.

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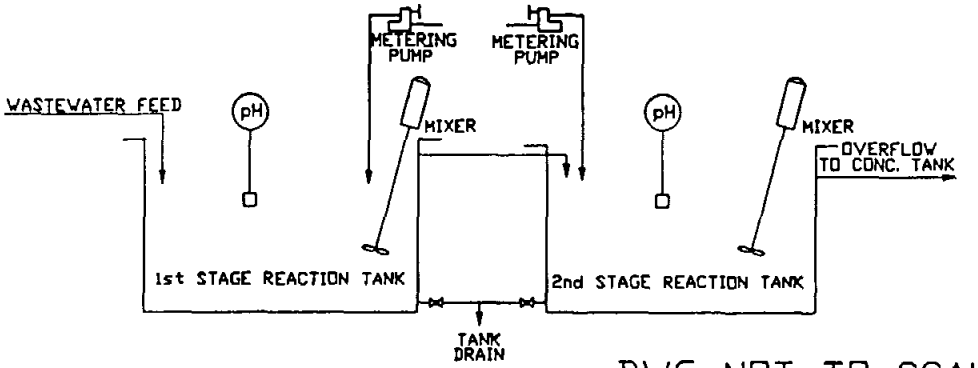


PROCESS DIAGRAM

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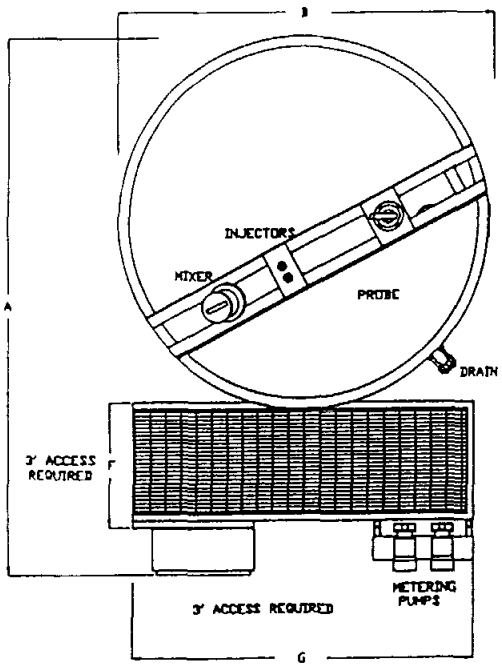
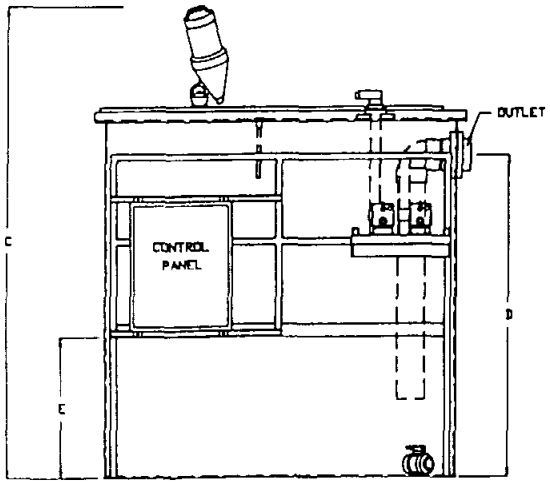
Wheelabrator Engineered Systems Inc. **Memtek**

REACTION SYSTEM HDPE

10/16/91 PAGE 17



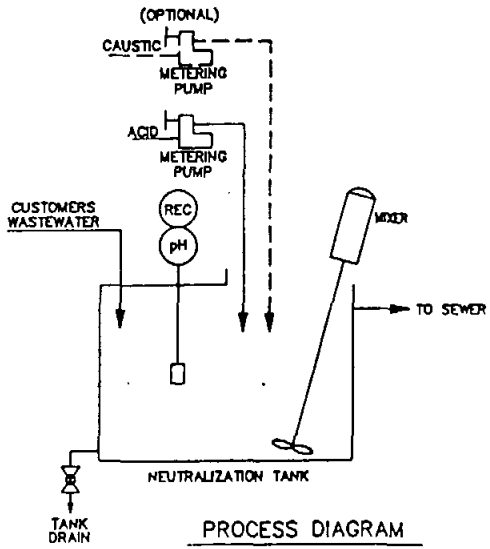




LAYOUT & ELEVATION

| MODEL # | TANK SIZE | | | OUTLET | MIXER HP. | MAX. FLOW | POWER REQUIREMENTS | DIMENSIONS (REF ONLY) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | VOL. | DIA. | HGT. | | | | | A | B | C | D | E | F | G |
| NSP250 | 250 | 36 | 60 | 3" | 1/4 | 20 GPM | 460V,3Ø,15AMP | 3'-4" | 3'-4" | 7'-4" | 4'-6" | N/A | N/A | N/A |
| NSP500 | 500 | 52 | 60 | 4" | 1/4 | 40 GPM | 460V,3Ø,15AMP | 4'-8" | 4'-8" | 7'-4" | 4'-6" | N/A | N/A | N/A |
| NSP750 | 750 | 60 | 66 | 6" | 1/3 | 60 GPM | 460V,3Ø,15AMP | 8'-2" | 5'-4" | 7'-10" | 5' | 2' | 2'-10" | 4'-6" |
| NSP1000 | 1000 | 66 | 72 | 6" | 1/2 | 80 GPM | 460V,3Ø,15AMP | 8'-8" | 5'-10" | 8'-4" | 5'-6" | 2'-5" | 2'-10" | 5' |
| NSP1500 | 1500 | 73 | 84 | 6" | 1/2 | 125 GPM | 460V,3Ø,15AMP | 9'-3" | 6'-5" | 9'-4" | 6'-6" | 3'-6" | 2'-10" | 5'-7" |
| NSP2000 | 2000 | 84 | 84 | 6" | 3/4 | 165 GPM | 460V,3Ø,15AMP | 10'-2" | 7'-4" | 9'-4" | 6'-6" | 3'-6" | 2'-10" | 6'-6" |
| NSP2500 | 2500 | 95 | 89 | 6" | 3/4 | 200 GPM | 460V,3Ø,15AMP | 12'-1" | 8'-3" | 9'-9" | 7'-5" | 3'-11" | 2'-10" | 7'-8" |

# ALL DATA SUBJECT TO CHANGE

NOTES:
1) STANDARD SYSTEM CONTAINS ONE CHEMICAL DELIVERY PUMP. (ELECTRICAL OR AIR OPERATED)
2) NS250 AND NS500 ARE EQUIPPED WITH PANEL/METERING PUMP SHELF MOUNTED ON TANK.
3) TANK MATERIAL IS HDPE.
4) CATWALK INCLUDED ON NSP750 TO NSP2500 ONLY.
5) 2nd METERING PUMP AND CONTROLLER FOR 2nd CHEMICAL ADDITION IS OPTIONAL.
6) HEAVY DUTY GEAR DRIVEN MIXER SUPPLIED.
7) ONE pH CONTROLLER/MONITOR AND ONE CHART RECORDER SUPPLIED.




PROCESS DIAGRAM

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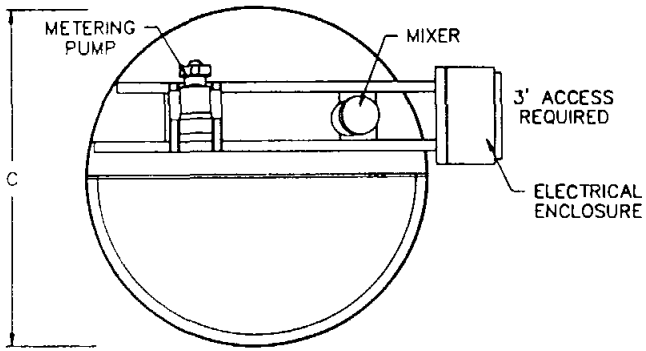
Wheelabrator Engineered Systems Inc. **Memtek**

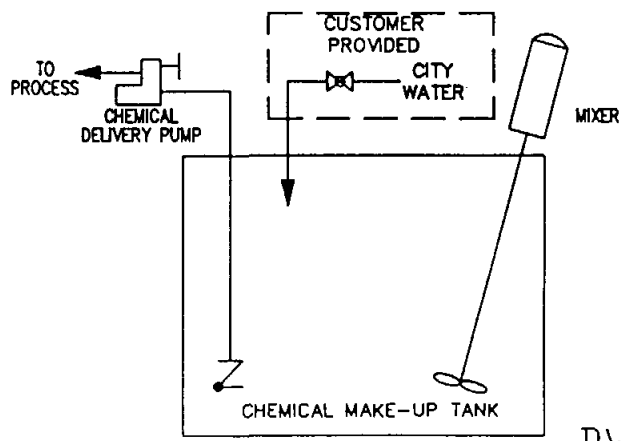
NEUTRALIZATION SYSTEM HDPE
10/16/91 PAGE 13




| MODEL # | TK VOL. | DIA. IN. | HGT IN. | MIXER HP | POWER REQUIREMENTS | WATER REQUIREMENTS | DIM (REF ONLY) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | A | B | C |
| PCP 50 | 50 | 22' | 36' | 1/20 | 460V, 3Ø, 15AMP | 10GPM @ 20PSI | 46' | 26' | 26' |
| PCP 100 | 100 | 28' | 42' | 1/4 | 460V, 3Ø, 15AMP | 15GPM @ 20PSI | 46' | 34' | 34' |
| PCP 275 | 275 | 42' | 48' | 1/3 | 460V, 3Ø, 15AMP | 25GPM @ 20PSI | 68' | 65' | 46' |
| PCP 500 | 500 | 52' | 60' | 1/3 | 460V, 3Ø, 15AMP | 40GPM @ 20PSI | 80' | 69' | 56' |
| PCP 1000 | 1000 | 66' | 72' | 1/2 | 460V, 3Ø, 15AMP | 50GPM @ 20PSI | 92' | 82' | 63' |

ALL DATA SUBJECT TO CHANGE

NOTES:
1) TANK MATERIAL HDPE W/1/2" POLYPRO HALF COVER.
2) AIR OPERATED DIAPHRAGM OR ELECTRICAL PUMP SUPPLIED.
3) ACCESS CATWALK AND PLATFORM FOR CHEMICAL PALLETS IS OPTIONAL.
4) ROLLING STAIRS PROVIDED FOR ACCESS (EXCEPT PCP50 & PCP100).




PROCESS DIAGRAM

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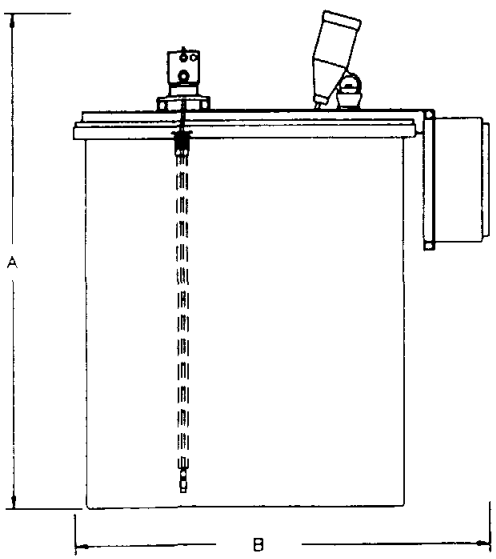


LAYOUT & ELEVATION

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10/16/91 PAGE 6

# Remedial Design for Operable Unit No. 1 Quality Assurance Project Plan at

# Woolfolk Chemical Works Superfund Site Fort Valley, Georgia

**Revision Number: 0**

August 1994

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REMEDIAL DESIGN FOR OPERABLE UNIT NO. 1

**QUALITY ASSURANCE PROJECT PLAN**

**Woolfolk Chemical Works Site**

**Fort Valley, Georgia**

***Signature Page***

| | |
|---|---|
| ERM-Southeast, Inc.<br>Project Manager | ERM-Southeast, Inc.<br>Analytical QC |
| Savannah Laboratories, Inc.<br>Project Manager | Savannah Laboratories, Inc.<br>Quality Assurance Officer |
| (Data Validator)<br>Project Manager | |
| Clean Sites, Inc.<br>Project Manager | Clean Sites, Inc.<br>Quality Assurance Officer |

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# TABLE OF CONTENT
# FOR QUALITY ASSURANCE PROJECT PLAN
**Woolfolk Chemical Works Site**


LIST OF TABLES iv
LIST OF FIGURES v
LIST OF APPENDICES vi

1.0 PROJECT DESCRIPTION . . . . . 1-1
1.1 INTRODUCTION . . . . . 1-1
1.2 PROJECT OBJECTIVES AND SCOPE . . . . . 1-1
1.3 SITE BACKGROUND INFORMATION AND PAST DATA COLLECTION ACTIVITIES . . . . . 1-3
1.4 MATRICES TO BE SAMPLED, PARAMETERS TO BE TESTED, AND SAMPLING FREQUENCY . . . . . 1-3
1.5 DATA QUALITY OBJECTIVES AND INTENDED DATA USES . 1-4

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY . . . . . 2-1
2.1 OVERVIEW . . . . . 2-1
2.2 PROJECT MANAGER . . . . . 2-1
2.3 FIELD AND REVIEW TEAM . . . . . 2-1
2.3.1 Field QC Officer and Field Team Leader . . . . . 2-1
2.3.2 Analytical QC Officer and Data Validator(s) . . . . . 2-2
2.3.3. Sample Collectors . . . . . 2-3
2.3.4 Laboratory Project Manager . . . . . 2-3
2.3.5 Laboratory Quality Assurance Officer . . . . . 2-3

3.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA . . 3-1
3.1 OVERVIEW . . . . . 3-1
3.1 LEVEL OF QUALITY CONTROL EFFORT . . . . . 3-1
3.3 ACCURACY, PRECISION, AND SENSITIVITY OF ANALYSES . . 3-3
3.4 COMPLETENESS, REPRESENTATIVENESS, AND COMPARABILITY . . . . . 3-5

4.0 SAMPLING PROCEDURES . . . . . 4-1

5.0 SAMPLE CUSTODY . . . . . 5-1
5.1 DOCUMENTATION AND CHAIN OF CUSTODY . . . . . 5-1
5.2 CHAIN-OF-CUSTODY RECORD . . . . . 5-1
5.3 SAMPLE CONTAINER LABELING . . . . . 5-2
5.4 CUSTODY SEALS . . . . . 5-3
5.5 FIELD LOGBOOK . . . . . 5-3
5.6 SAMPLE DELIVERY TO THE LABORATORY . . . . . 5-6

# TABLE OF CONTENT
# FOR QUALITY ASSURANCE PROJECT PLAN
**Woolfolk Chemical Works Site**


5.7 LABORATORY CUSTODY ..... 5-6
5.8 SAMPLE DISPOSAL ..... 5-7

6.0 CALIBRATION PROCEDURES AND FREQUENCY ..... 6-1
6.1 FIELD INSTRUMENTS AND EQUIPMENT ..... 6-1
6.2 LABORATORY CALIBRATION ..... 6-3

7.0 ANALYTICAL PROCEDURES ..... 7-1
7.1 LABORATORY ANALYSES ..... 7-1
7.2 FIELD ANALYTICAL PROTOCOLS ..... 7-1

8.0 DATA REDUCTION, VALIDATION, AND REPORTING ..... 8-1
8.1 DATA REDUCTION ..... 8-1
8.1.1 Definition ..... 8-1
8.1.2 Background Data ..... 8-1
8.2 DATA VALIDATION ..... 8-1
8.3 LABORATORY REPORTING ..... 8-2
8.4 RECORDS ..... 8-3

9.0 INTERNAL QUALITY CONTROL CHECKS ..... 9-1
9.1 FIELD SAMPLE COLLECTION ..... 9-1
9.2 FIELD MEASUREMENTS ..... 9-1
9.3 LABORATORY ANALYSES ..... 9-2
9.3.1 Quality Assurance Program ..... 9-2
9.3.2 Quality Control Checks ..... 9-2

10.0 PERFORMANCE AND SYSTEM AUDITS ..... 10-1
10.1 FIELD AUDITS ..... 10-1
10.2 LABORATORY AUDITS ..... 10-1

11.0 PREVENTATIVE MAINTENANCE ..... 11-1
11.1 FIELD EQUIPMENT/INSTRUMENTS ..... 11-1
11.2 LABORATORY INSTRUMENTS ..... 11-1

12.0 SPECIFIC ROUTINE PROCEDURES TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS ..... 12-1
12.1 FIELD MEASUREMENTS ..... 12-1
12.2 LABORATORY DATA ..... 12-1
12.2.1 Precision ..... 12-1

# TABLE OF CONTENT
# FOR QUALITY ASSURANCE PROJECT PLAN
**Woolfolk Chemical Works Site**


12.2.2 Accuracy ..... 12-2
12.2.3 Completeness ..... 12-2
12.2.4 Sensitivity ..... 12-3

13.0 CORRECTIVE ACTIONS ..... 13-1
13.1 GENERAL ..... 13-1
13.2 SAMPLE COLLECTION/FIELD MEASUREMENTS ..... 13-1
13.3 LABORATORY ANALYSES ..... 13-4

14.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT ..... 14-1

## LIST OF TABLES

1-1 Frequency of Sample Collection and Analyses to be Performed

## LIST OF FIGURES


| | |
|---|---|
| 2-1 | Project Team Organization |
| 5-1 | Analysis Request and Chain of Custody Report |
| 5-2 | Typical Sample Label and Custody Seal |

## List of Appendices


| | |
|---|---|
| A | Savannah Laboratories and Enviromental Services, Inc. Comprehensive Quality Assurance Plan |
| B | pH, Specific Conductance, and Temperature Meter Calibration Information |

# *1.0 PROJECT DESCRIPTION*

## *1.1 INTRODUCTION*

This Quality Assurance Project Plan (QAPP) is for the remedial design (RD) of Operable Unit 1 (OU1) at the Woolfolk Chemical Works site (the Site), located in Fort Valley, Georgia. The QAPP is being submitted as part of the Sampling and Analysis Plan (SAP) required by Unilateral Administrative Order USEPA docket No. 94-25-C. The effective date of the order is June 3, 1994. The QAPP presents the organization, objectives, functional activities, and specific quality assurance (QA) and quality control (QC) activities associated with the sampling and laboratory analyses to be conducted as part of the RD work at the site. The QAPP has been prepared in accordance with EPA-600/4-83-004, Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans.

## *1.2 PROJECT OBJECTIVES AND SCOPE*

The primary objective of the RD at the Site is to prepare a design for OU1 that when implemented will:

- limit further degradation of the Surficial Aquifer by contaminant concentrations exceeding performance standards that are defined in the Record of Decision (ROD) and summarized in Table 1-3 of the RD Work Plan (WP),

- limit further degradation of the Upper Cretaceous Water Table Aquifer by contaminants exceeding performance standards that are defined in the

ROD, and remediate off-site contamination in this aquifer originating for the Site.

- limit further degradation of the Upper Cretaceous Confined Aquifer by contaminant concentrations exceeding performance standards that are defined in the ROD, and remediate off-Site contamination in this aquifer originating from the Site; and

- limit downward migration of contaminants from contacting the Tuscaloosa Aquifer in concentrations exceeding performance standards that are defined in the ROD.

A secondary objective will be to further delineate the extent of contaminates in the Surficial, Upper Cretaceous Water Table, and Upper Cretaceous Confined Aquifers at the Site. These objectives will be achieved by implementing a Scope of Work that will include the following tasks:

- Aquifer testing to estimate specific capacities of proposed recovery wells and to make projections of total flow from the ground water recovery system.

- Conduct treatability studies to evaluate the effectiveness of various methods to reduce the concentrations of contaminants in the recovered ground water to acceptable levels prior to discharge.

- Evaluate and select a discharge option for the recovered ground water following treatment. These options will include discharge to a POTW, a

receiving stream, and an infiltration gallery. Field infiltration tests will be conducted as part of the process of evaluating the feasibility of utilizing an infiltration gallery.

- Collect and analyze ground water samples from existing monitoring wells.
- Collect ground water elevation data.
- Based on the results of ground water quality and elevation monitoring, install and sample additional monitoring wells, if warranted.
- Prepare the final design of OU1

## *1.3 SITE BACKGROUND INFORMATION AND PAST DATA COLLECTION ACTIVITIES*

A description of the Site, its history, and a summary of past data collection activities and results are presented in Section 1 of the WP.

## *1.4 MATRICES TO BE SAMPLED, PARAMETERS TO BE TESTED, AND SAMPLING FREQUENCY*

RD efforts covered by this QAPP are limited to the collection and analyses of ground water samples associated with efforts to further delineate the extent of ground water contamination at the Site. Table 1-1 presents a summary of the frequency of sample collection (including field QA/QC samples) and the

# TABLE 1-1
# FREQUENCY OF SAMPLE COLLECTION AND ANALYSES TO BE PERFORMED

## Woolfolk Chemical Works Site RD/RA

| Analyses | Ground Water Samples to be Collected | Field Blank | Trip Blank | Duplicate | Rinseate Blank | MS/MSD |
|---|---|---|---|---|---|---|
| VOCs | 13+ | 1/20 samples | 1/shipment | 1/20 samples | 1/day/equipment type | 1/20 Samples (Triple Volume Required) |
| SVOCs | 13+ | 1/20 samples | N/A | 1/20 samples | 1/day/equipment type | 1/20 Samples (Triple Volume Required) |
| TAL Inorganics | 13+ | 1/20 samples | N/A | 1/20 samples | 1/day/equipment type | 1/20 Samples (Triple Volume required) |
| Pesticides | 13+ | 1/20 samples | N/A | 1/20 samples | 1/day/equipment type | 1/20 Samples (Triple Volume Required) |

analytical parameters for which each will be analyzed. Additional details concerning the analytical parameters are presented in the WP, as is information concerning the sample network design and rationale.

Currently it is planned that ground water samples will be collected from 13 existing monitoring wells. Depending on the results of analyses conducted on these samples, addtional monitoring wells may be installed and sampled. All analyses will be performed by Savannah Laboratories and Environmental Services, Inc. (Savannah Labs) located in Savannah, Georgia. Savannah Labs' Comprehensive Quality Assurance Plan is included as Appendix A to this QAPP. All analyses will be in accordance with the Contract Laboratory Program (CLP) March 1990 Statement of Work (SOW).

## *1.5 DATA QUALITY OBJECTIVES AND INTENDED DATA USES*

Data Quality Objectives (DQOs) are qualitative and quantitative statements that specify the quality of the data required to support decisions made during the RD activities and are based on the end uses of the data to be collected. As such, different data uses may require different levels of data quality. As detailed in Data Quality Objectives for Remedial Response Activities (USEPA, March 1987), there are five analytical levels that address various data uses and the QA/QC effort and methods required to achieve the desired level of quality.

These levels include:

- **Screening** (DQO Level 1): This level provides the lowest data quality but the most rapid results. It is often used for health and safety monitoring at a site, preliminary comparison of data to Applicable or Relevant and Appropriate Requirements (ARARs), initial site characterization to locate areas that require subsequent and more accurate analyses, and engineering screening of alternatives (bach-scale tests).

- **Field Analyses** (DQO Level 2): This level provides rapid results and better quality than in DQO Level 1. This level may include mobile-laboratory generated data, depending on the level of QC exercised.

- **Engineering** (DQO Level 3): This level provides an intermediate level of data quality and is used for site characterization. Engineering analyses may include mobile-laboratory generated data and some analytical laboratory methods (e.g., laboratory data with quick turnaround used for screening but without full QC documentation).

- **Conformational** (DQO Level 4): This level provides the highest level of data quality and is used for the purposes of conducting a risk assessment, evaluating remedial alternatives, and determining PLPs. These analyses require full CLP analytical methods and data validation procedures in accordance with EPA-recognized protocols.

- **Nonstandard** (DQO Level 5): This level refers to analyses by nonstandard protocols, for example, when exacting detection limits or the

analysis of an unusual chemical compound is required. These analyses often require method development or adaptation. The level of QC is usually similar to DQO Level 4 data.

The primary data uses for the sampling activities at the Woolfolk Chemical Works Site during this RD is to further delineate the extent of ground water contamination at the site. This information will be evaluated to determine the need to expand OU1 to areas outside those proposed in the Feasibility Study. With the exception of field measured pH, specific conductance, and temperature of samples, the DQO for all analyses conducted during the RD will be Level 4.

## *2.0 PROJECT ORGANIZATION AND RESPONSIBILITY*

### *2.1 OVERVIEW*

The project team organization for the RD sampling effort is shown in Figure 2-1. The responsibilities of key members of the project team are discussed below.

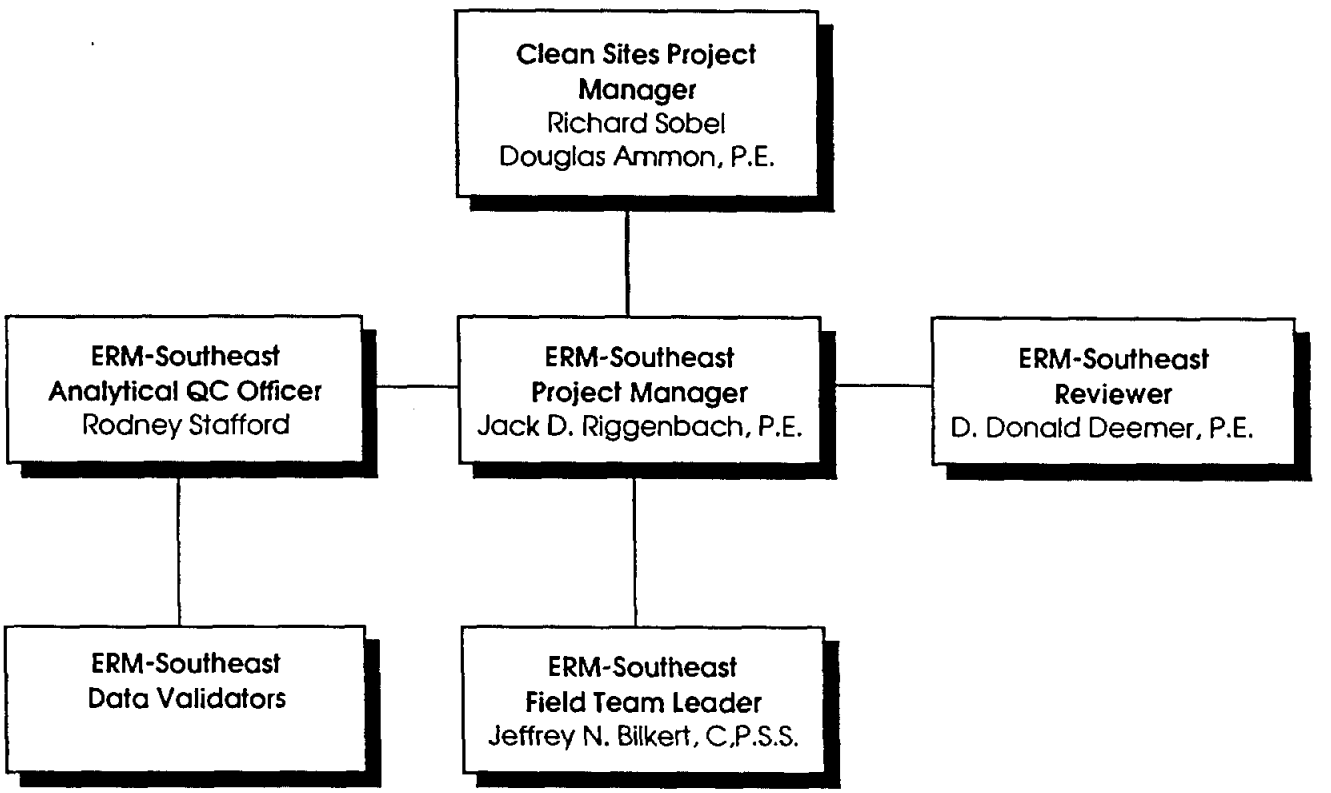
Primary responsibility for project quality rests with the ERM-Southeast Project Manager (PM). Senior technical reviewers and QA auditors perform independent QA review. Qualifications of the project personnel will be provided upon request. The Field Team Leader will also be the Field Q Officer.

### *2.2 PROJECT MANAGER*

The PM will be responsible for project execution and for all technical, financial, and administrative aspects of the project. The PM will also select properly trained and qualified personnel. The PM will be the primary contact between ERM-Southeast and Clean Sites, Inc. The Clean Sites PM will be responsible for the coordination/communication with the Agency.

### *2.3 FIELD AND REVIEW TEAM*

A field and QA review team has been organized to meet the specific technical needs of the project. The review team will ensure that all work is performed in accordance with the Field Sampling and Analyses Plan (FSAP) and this QAPP.




ERM–Southeast, Inc.
Kennesaw, Georgia
ERM

PROJECT TEAM ORGANIZATION
QAPP FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE
2–1

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### *2.3.1 Field QC Officer and Field Team Leader*

The Field QC Officer and Field Team Leader (FTL) review and advise on all aspects of QA/QC related to sample collection and shipping. Responsibilities include:

- Issuing modifications to sampling procedure when necessary.
- Assisting in the collection of samples.
- Verifying that of samples are collected, labeled, preserved, stored, and transported as specified in the QAPP and FSAP.
- Checking that all sample documentation (labels, field notebooks, chain-of-custody records, packing lists) is correct and transmitting that information with the samples to the analytical laboratory.

### *2.3.2 Analytical QC Officer and Data Validator(s)*

Mr. Rodney Stafford, of ERM-Southeast will be the Analytical QC officer. Mr. Stafford will be responsible for: (1) coordinating and scheduling all data validation, (2) approving the QAPP, and (3) overseeing the data review and preparation of the validated data packages.

The Data Validator(s) (DV(s)) will systematically review the analytical data for compliance with the established QA/QC criteria such as holding times, spike, duplicate, blank results, etc., as provided by the laboratory. The DV(s) will also

evaluate data accuracy, precision, sensitivity, and completeness, and determine data usability.

### *2.3.3. Sample Collectors*

The Sample Collectors (SCs) will be supervised by the FTL. The SCs will:

- Collect and label the samples following the procedures outlined in the QAPP and FSAP.
- Complete all necessary documentation.
- Pack and ship the samples.

The technical staff for this project will be drawn from ERM-Southeast's office located in Kennesaw, Georgia.

### *2.3.4 Laboratory Project Manager*

Savannah Labs will designate a Laboratory Project Manager (LPM) who will be responsible for: (1) coordinating and scheduling the laboratory analyses, (2) supervising in-house chain of custody, (3) approving the QAPP, and (4) overseeing data review and preparation of the analytical reports.

### *2.3.5 Laboratory Quality Assurance Officer*

The laboratory will designate a Quality Assurance Office (QAO) who will be

responsible for reviewing the laboratory QA protocols and the QA/QC documentation of the analytical results, conducting the data review, selecting any necessary laboratory corrective actions, preparing the standard operating procedures (SOPs), and approving the QAPP and the final analytical reports.

# *3.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA*

## *3.1 OVERVIEW*

The overall QA objective is to develop and implement procedures for field sampling, chain of custody, field and laboratory analyses, and data reporting that will provide results that further characterize the horizontal and vertical extent of ground water contamination resulting from past practices at the site. The data must be legally defensible in a court of law. Specific procedures for sampling, chain of custody, laboratory instrument calibration, field and laboratory analysis, data reporting, internal quality control, audits, preventative maintenance of field equipment, and corrective action are described in other sections of this QAPP and in the FSAP. The purpose of this section is to address the level of the quality control effort and to establish specific objectives for accuracy, precision, completeness, representativeness, and comparability of the data.

## *3.1 LEVEL OF QUALITY CONTROL EFFORT*

Trip blanks, field blanks, duplicates, equipment rinseate blanks, and matrix spike samples will be analyzed to assess the quality of the data resulting from the field sampling program. Field blanks and rinseate blanks will be analyzed to check for any on-site procedural contamination that may affect samples. Trip blanks, consisting of deionized ultra pure water, will also be submitted to the analytical laboratory to provide the means to assess the quality of the data resulting from the field sampling program. Trip blanks are used to assess the potential for contamination of samples because of contaminant migration during sample shipment and storage. Duplicate samples will be analyzed to check for sampling

and analytical reproducibility. Matrix spikes will provide information about the effect of the sample matrix on the digestion and measurement methodology. The matrix spikes for organic analyses are performed in duplicate and are hereafter referred to as MS/MSD samples. The frequency with which these QC samples will be collected/submitted and/or analyzed is summarized in Table 1-1 of this QAPP.

The level of QC effort will be one field duplicate for every 20 or fewer ground water samples. Field blanks will be collected at a rate of one for every 20 or fewer ground water samples. Equipment rinseate blanks will be collected at a rate of one per day for each type of sampling equipment used. One VOC trip blank consisting of deionized, ultra pure water will be included along with each shipment of VOC water samples.

Water samples for organic analyses will be designated for MS/MSD analyses at a rate of one per group of 20 or fewer ground water samples. Ground water samples designated for MS/MSD analyses must be collected at triple the volume for VOCs and extractable organics. Ground water samples designated for MS/MSD inorganic analyses will be collected at triple the normal volume to permit a spike analyses and spike duplicate. A spike duplicate is not required for inorganic samples. Sampling procedures are specified in the FSAP. The level of QC effort provided by the laboratory will meet the requirements of the CLP March 1990 SOW.

Field instruments used during the sampling will include a combination pH, specific conductance, and temperature meter. The pH meter will be calibrated at the beginning of each work day with calibration verification once every ten

investigative samples. Calibration of the pH meter will be conducted using two buffer solutions and the manufacturer's instructions. The performance of the temperature probe on the pH meter will be verified once per week by comparison with a glass mercury thermometer. QC effort for specific conductivity measurements will consist of calibration at the beginning of the day. A standard solution with a known specific conductance will be used to calibrate the conductivity meter.

## *3.3 ACCURACY, PRECISION, AND SENSITIVITY OF ANALYSES*

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter. Analytical accuracy can be determined using known reference materials or matrix spikes. Spiking of reference materials into the actual sample matrix is the preferred technique because it quantifies the effects of the matrix on the analytical accuracy.

Accuracy can be expressed as the percent recovery (%R) as determined by the following equation:

$$\%R = \frac{SPV - SAV}{SA} \times 100$$

Where:

SAV = The background value, value obtained by analyzing the sample.

SA = Concentration of the spike added to the sample.

SPV = Value obtained by analyzing the sample with the spike added.

Precision is a measure of agreement among individual measurements of identical samples. It is developed from the field duplicate and laboratory duplicate analyses. In routine analyses, precision data are derived from duplicate matrix spike or laboratory control standard results. Precision will be expressed as the relative percent difference (RPD) and will be calculated as follows:

$$RPD = \frac{|V_1 - V_2|}{(V_1 + V_2)/2} \times 100$$

where $V_1$ and $V_2$ are the two values obtained by analyzing the duplicate samples.

Quantitation limits will be used to evaluate the sensitivity of the analyses, the matrix from which it was extracted, and the performance of the detector used. Quantitation limits specified in the CLP Statements of Work for Organic and Inorganic Analyses will be reported for all analytical work. Nominal quantitation limits may not be achievable due to matrix interferences; therefore, the lowest possible quantitation limits will be reported. The goals for accuracy and precision for this project will be as specified in the CLP March 1990 SOW.

## *3.4 COMPLETENESS, REPRESENTATIVENESS, AND COMPARABILITY*

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. It is expected that the laboratory will provide data meeting QC acceptance criteria for 95 percent or more of the investigative samples submitted for CLP protocol analyses.

Representativeness, which will be assessed by the analyses of field duplicate samples, expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Representativeness is a qualitative parameter that is dependent upon the proper design of the sampling program and proper selection of laboratory protocols. During the development of the scope of work, consideration was given to existing analytical data, the site physical setting, and project sampling objectives. The rationale of the scope of work is discussed in the WP. Representativeness will be satisfied by ensuring that the QAPP and FSAP are followed.

Comparability expresses the confidence with which one data set can be compared with another. The extent to which existing and planned analytical data will be comparable depends on the similarity of sampling and analytical methods. The procedures used to obtain the planned analytical data, as documented in the QAPP, are expected to provide comparable data. These new analytical data, however, may not be directly comparable to existing data because of differences in procedures and QA objectives.

## *4.0 SAMPLING PROCEDURES*

Sampling procedures for all sampling activities associated with the QAPP are described in the FSAP.

# *5.0 SAMPLE CUSTODY*

## *5.1 DOCUMENTATION AND CHAIN OF CUSTODY*

A required portion of any sampling and analytical program is the system for sample control from collection to data reporting. These includes the ability to trace the possession and handling of samples from the time of collection through analyses and final disposition. This documentation of the sample's history is referred to as the chain of custody. The components of the chain of custody, and the procedures for their use are described below.

A sample is considered to be under a person's custody if it is:

- In a person's physical possession.
- In view of the person after he has taken possession.
- Secured by that person so that no one can tamper with the sample.
- In a designated secure area.

A person who has samples under custody must comply with the procedures described in the following sections.

## *5.2 CHAIN-OF-CUSTODY RECORD*

To establish the documentation necessary to trace sample possession from the time of collection, a chain-of-custody record will be filled out and accompany every sample. A chain-of -custody record is illustrated in Figure 5-1.

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☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 Phone: (813) 885-7427 Fax (813) 885-7049


## ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

| P.O. NUMBER | PROJECT NUMBER | PROJECT NAME | MATRIX TYPE | REQUIRED ANALYSES | PAGE | OF |
|---|---|---|---|---|---|---|
| CLIENT NAME | | TELEPHONE/FAX NO | | | | |
| CLIENT ADDRESS | | CITY STATE ZIP CODE | | | | |
| SAMPLER(S) NAME(S) | | CLIENT PROJECT MANAGER | | | | |

☐ STANDARD TAT

☐ EXPEDITED TAT *

REPORT DUE DATE _____

* SUBJECT TO RUSH FEES

| SAMPLING DATE | SAMPLING TIME | SAMPLE IDENTIFICATION | AQUEOUS MATRIX | NONAQUEOUS MATRIX | OIL MATRIX | AIR MATRIX | NUMBER OF CONTAINERS SUBMITTED | | | | | | | | | | |
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| | | | | | | | | |

**FOR SAVANNAH LABORATORY USE ONLY**

| RECEIVED FOR LABORATORY BY: (SIGNATURE) | DATE | TIME | CUSTODY INTACT ☐ YES ☐ NO | CUSTODY SEAL NO. | S.L. LOG NO. | LABORATORY REMARKS |
|---|---|---|---|---|---|---|
| | | | | | | |

ERM-Southeast, Inc.
Kennesaw, Georgia
ERM

# ANALYSIS REQUEST AND CHAIN OF CUSTODY REPORT
QAPP FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 5-1

The record will contain the following minimum information:

- Project name and/or number.
- Signature of collector(s).
- Sample I.D. number.
- Number of containers.
- Name of shipper.
- Date shipped.
- Signatures of people involved in the chain of possession.
- Inclusive dates and times of possession.

In order to maintain chain of custody, each person who has custody of the sample will sign, date and note the time on the form. Samples will not be left unattended unless placed in a secured and sealed container (using custody seals) with the chain-of-custody record inside the container.

## *5.3 SAMPLE CONTAINER LABELING*

Each sample container that is used during the RD will have following information on a label on the container or printed directly on the container.

- Client/Project name.
- Sample I.D. number.
- Location.
- Time and date collected.

- Analyses requested.
- Sampler's initials

A sample label is shown in Figure 5-2.

## *5.4 CUSTODY SEALS*

Custody seals (Figure 5-2) are used to detect unauthorized tampering of samples following sample collection, up to the time of analyses. Items such as gummed paper seals and custody tape can be used for this purpose. The attached seal will be of the type that must be broken to open the sample container. Seals will be affixed to each individual sample container before the sample leaves the custody of the sampling personnel. Shipping containers will also be sealed to detect possible tampering. A seal will include the following information:

- Sampler's signature.
- Date of collection.
- Seal I.D. number.
- Date.

## *5.5 FIELD LOGBOOK*

All field activities and sampling events will be recorded in a permanently bound logbook or equivalent standardized form. Each page or form will be consecutively numbered. All entries will be made in indelible ink, and all corrections will consist of line-out deletions that are initialed. At a minimum,

4401SLCS.DWG 08-09-94 AM 1=1 TIWK

Client _____

Sample ID _____

Location _____

Analysis _____

Preservative _____

Collection Date/Time _____

Collected By _____

**SL** *SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.*

OFFICIAL SAMPLE SEAL

SAMPLE ID

SIGNATURE

SEAL NO. DATE TIME

SEAL BROKEN BY

DATE

ERM-Southeast, Inc.
Kennesaw, Georgia
ERM

# TYPICAL SAMPLE LABEL AND CUSTODY SEAL

QAPP FOR SUPERFUND REMEDIAL DESIGN
WOOLFOLK CHEMICAL WORKS
FORT VALLEY, GEORGIA

FIGURE 5-2

consecutively numbered. All entries will be made in indelible ink, and all corrections will consist of line-out deletions that are initialed. At a minimum, entries in a logbook made during sampling activities will include the following:

- Location and description of sampling point.
- Details of the sampling point (e.g., distance from a permanent feature).
- Documentation of procedures for preparation of reagents or supplies that become an integral part of the sample.
- Identification of sampling team members.
- Type of sample.
- Number and volume of samples taken.
- Sample type taken (e.g., natural, replicate, blind field standard, blanks).
- Sampling methodology.
- Sample preservation.
- Date and time of collection.
- Weather conditions.

- Sample distribution and how transported (e.g., name of the laboratory and cartage agent [Federal Express]).
- References, such as maps of the sampling site.
- Field observations.
- Any field measurements made (e.g., ambient and cooler temperature).
- Identify recipients of any split samples.
- Decontamination procedures.
- Deviations from the QAPP and/or FSAP.

Field sampling situations vary widely. Therefore, no general rules can specify the extent of information that must be entered in the logbook. However, the field logbooks will contain sufficient information so that the sampling activity can be reconstructed without relying on the field team's memory. Further details regarding completion of field logbooks are specified in the FSAP and WP.

Strict custody procedure shall be maintained with the field logbook. While being used in the field, field logbooks must remain with the field team at all times. Upon completion of the field effort, field logbooks must be filed and secured in the project office. Photocopies of the original field logbooks will be used as working documents.

## *5.6 SAMPLE DELIVERY TO THE LABORATORY*

Samples will be properly packaged for shipment and dispatched to the appropriate laboratory, as soon as possible after sampling, for analyses with a separate signed custody record enclosed in each sample box or cooler. Shipping containers will be secured with strapping tape and custody seals for shipment to the laboratory. The custody seals will be covered with clear plastic tape. The cooler will be strapped shut with strapping tape in at least two locations.

All shipments will be accompanied by the chain-of-custody record identifying the contents. The original record will accompany the shipment. Copies will be retained by the sampler for return to the sampling office.

If the samples are sent by common carrier, a bill of lading will be used. Receipts of bills of lading will be retained as part of the permanent documentation. Commercial carriers are not required to sign off on the custody form as long as the custody forms are sealed inside the sample cooler and the custody seals remain intact.

Samples will be shipped via overnight express delivery in coolers, adequately packed to avoid damage under normal handling. Upon shipment of all samples, the designated analytical laboratory will be notified.

## *5.7 LABORATORY CUSTODY*

Laboratory custody will conform to procedures established for the CLP March

1990 SOW. These procedures include:

- Designating a laboratory sample custodian.
- Completing chain-of-custody records and sample analyses request forms.
- Documenting sample condition upon receipt.
- Tracking and documenting location and status of laboratory samples.
- Storing samples in a secure and appropriate (refrigerated, dry) environment.
- Logging data and documenting data and procedures properly.

## *5.8 SAMPLE DISPOSAL*

The analytical laboratory will dispose of unused sample portions, according to Resource Conservation and Recovery Act (RCRA) regulations, after the analyses have been completed and any outstanding issues between ERM-Southeast and the laboratory have been resolved.

## *6.0 CALIBRATION PROCEDURES AND FREQUENCY*

### *6.1 FIELD INSTRUMENTS AND EQUIPMENT*

Field instruments and equipment expected to be used during THE RD include the following:

- pH meter,
- specific conductance meter,
- temperature probe, and
- water level probe.

Specific procedures for calibrating the combination pH, and specific conductance, and temperature are provided in Appendix B of this QAPP. The pH meter and conductance meter will be calibrated daily. Calibration of the pH meter will include the use of two standard buffer solutions. Calibration of the specific conductance meter will include the use of a standard solution of known conductance. Entries will be made in the field logbook to document these activities. Calibration of the water level probe will be per the manufacturer's recommendations, as applicable.

Equipment that fails calibration or becomes inoperable during use shall be removed from service and either segregated to prevent inadvertent use or tagged to indicate it is out of calibration. Such equipment shall be repaired and satisfactorily recalibrated. Equipment that cannot be repaired will be replaced. Backup equipment will be available in the field for use in the event of a malfunction.

## *6.2 LABORATORY CALIBRATION*

The analytical laboratory is responsible for equipment and instrument calibration and maintenance. Manufacturer's guidance will be followed for general upkeep. The laboratory also is required to comply with the calibration criteria specified in the *CLP User's Guide*.

Every instrument used to analyze samples must pass the calibration criteria established in the CLP March 1990 SOW. Initial calibration criteria for instrument linearity, sensitivity, resolution, and deactivation must be met before samples can be analyzed. Sustained performance is monitored periodically during sample analyses by the use of continuing calibration check standards.

## *7.0 ANALYTICAL PROCEDURES*

### *7.1 LABORATORY ANALYSES*

All laboratory analyses will be in accordance with the CLP March 1990 SOW.

### *7.2 FIELD ANALYTICAL PROTOCOLS*

Field measurement of pH, temperature, and specific conductivity, will be performed in accordance with the equipment manufacturer's instructions presented in Appendix B of this QAPP.

# *8.0 DATA REDUCTION, VALIDATION, AND REPORTING*

## *8.1 DATA REDUCTION*

### *8.1.1 Definition*

Analytical data will be input by the laboratory into a computerized data base. All entries will be verified. The LPM will handle data entries that are unverified. Units for water sample results will be reported in micrograms per liter.

### *8.1.2 Background Data*

Background data produced for internal records and not reported as part of the analytical data include the following: laboratory worksheets, laboratory notebooks, sample tracking system forms, instrument logs, standards records, maintenance records, calibration records, and associated QC. These sources will be available for inspection during audits and to determine the validity of data.

## *8.2 DATA VALIDATION*

ERM-Southeast will conduct the validation of the data in accordance with the most current version of the following EPA documents:

- *Laboratory Data Validation, Functional Guidelines for Evaluating Organics Analysis*

- *Laboratory Data Validation, Functional Guidelines for Evaluating Inorganics Analysis*

Region IV will be contacted to verify that the most current version is being used before conducting the data validation. The data validation personnel will be familiar with the project, its objectives, and the intended use of the data. A data validation summary will be prepared for the sampling data and presented in the project report.

## *8.3 LABORATORY REPORTING*

The laboratory report will contain such information for samples as:

- Title and location of the project.
- Project identification number.
- Date report was prepared.
- Sample identification number.
- Name and location of sample.
- Type of sample.
- Date on which analyses were performed.
- The LPM's signature.

## *8.4 RECORDS*

The following describes procedures for maintaining the project's records:

- PM shall maintain records in accordance with the requirements of this section.

- Records of field activities that support the integrity of samples shall be entered on bound and numbered pages. Such records shall be dated and signed or otherwise authenticated on the day of entry.

- Records retained on file shall be indexed. The indexing system shall include the location of records within the indexing system. The indexing system shall be in alphabetical, chronological or numerical order, or as otherwise indicated in written procedures.

- There shall be sufficient information in records to permit identification between the record and the item(s) or activity to which it applies. Identification of records will be by means that permit traceability.

- The records storage system shall provide for accurate retrieval of records without undue delay.

## *9.0 INTERNAL QUALITY CONTROL CHECKS*

### *9.1 FIELD SAMPLE COLLECTION*

All field QC procedures will be carried out according to this QAPP and the protocol detailed in the FSAP. These procedures will include:

- Sample collection, including MS/MSDs, field duplicates, field blanks, and trip blanks for use in the assessment of precision and accuracy, according to the sampling procedures established in the FSAP.

- Proper decontamination of sampling equipment after each use, as described in of the FSAP.

- Proper calibration of the field instruments/equipment, as established in Section 6.1 of this QAPP.

### *9.2 FIELD MEASUREMENTS*

QC of field measurements of pH, temperature, and conductivity, will be maintained through proper calibration of equipment and replication of measurements to ensure reproducibility.

## *9.3 LABORATORY ANALYSES*

### *9.3.1 Quality Assurance Program*

The laboratory will be required to have a written QA/QC program that provides rules and guidelines to ensure the reliability and validity of work conducted at the laboratory. The Comprehensive Quality Assurance Plan for Savannah Laboratories is included in Appendix A of this QAPP. Compliance with the QA/QC program will be coordinated and monitored at the laboratory by the QAO who is independent of the operating departments.

All laboratory procedures will be documented in writing as either a CLP March 1990 SOW or a method procedure that is edited and controlled by the QAO. Internal QC procedures for analytical services will be conducted in accordance with their Quality Assurance Plan or the method SOP requirements.

### *9.3.2 Quality Control Checks*

The QC checks include analyzing sample spikes, surrogate spikes, reference samples, controls, and/or blanks. The frequency of QC checks, the compounds to be used for spikes, and the QC acceptance criteria are described, as appropriate, in the CLP SOW for each analytical method.

The laboratory will document that both initial and ongoing instrument and analytical QC functions have been met. Any samples analyzed in nonconformance with the QC criteria will be reanalyzed by the laboratory if sufficient sample volume is available. It is expected that sufficient volumes of

samples will be collected to allow for reanalyses. If sufficient sample volume is not available, corrective action procedures (Section 13.0) will be initiated.

## *10.0 PERFORMANCE AND SYSTEM AUDITS*

### *10.1 FIELD AUDITS*

QA audits of field measurement, sample collection, and sample custody procedures will be conducted by the ERM-Southeast Field QC Officer to document that field activities are performed in accordance with the FSAP and this QAPP. An initial audit will be conducted at the start of the project to ensure that all established procedures are being followed. Subsequent periodic audits will be made weekly (if the sampling activities continue for more than one week) to ensure continued quality sampling and to correct any deficiencies. Audits will be scheduled to allow oversight of as many field activities as possible.

The field audits will include an evaluation of sampling methods, sample handling and packaging, equipment use, equipment decontamination, maintenance, and calibration procedures, and chain-of-custody procedures. In addition, all of the records and the documentation procedures will be reviewed to ensure compliance with the project requirements. Field measurements will be observed for compliance with the approved procedures. Any deviations from the QAPP or FSAP will be recorded in the field notebook by the person conducting the audit, who will then inform the personnel involved in the activity of the problem, and will initiate corrective action procedures, if necessary.

### *10.2 LABORATORY AUDITS*

The laboratory's QA audits will be the responsibility of the laboratory QAO, who

will submit a certification to the ERM-Southeast Analytical QC Officer that the appropriate audits have been conducted. Laboratory audits, at a minimum, will be conducted on an annual basis and will include an examination of laboratory documentation of sample receiving, sample log-in, sample storage, chain-of-custody procedure, sample preparation and analyses, instrument operating records, and sample bottle procurement and certification. Specific internal auditing procedures for Savannah Laboratories are included in Appendix A of this QAPP.

## *11.0 PREVENTATIVE MAINTENANCE*

### *11.1 FIELD EQUIPMENT/INSTRUMENTS*

Preventative maintenance procedures for the pH meter, specific conductivity meter, temperature probe and ground water level meter will be carried out in accordance with their manufacturer's recommendations. In addition, all field equipment will be cleaned at the end of each day and between samples to help ensure proper performance. All field equipment will be calibrated at the start of each day and as specified in Section 6.0 of this QAPP. All calibrations will be recorded in the field logbook.

### *11.2 LABORATORY INSTRUMENTS*

The preventative maintenance procedures for the laboratory equipment will be the responsibility of the laboratory. All equipment at the laboratory will be maintained as part of their overall QA/QC program. All laboratory instruments should be routinely serviced and maintained according to the manufacturer's specifications. Full documentation of the maintenance/history of each instrument should be maintained in an instrument service logbook. Details concerning preventative maintenance programs conducted by Savannah Laboratories are presented in Appendix A of this QAPP.

## *12.0 SPECIFIC ROUTINE PROCEDURES TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS*

### *12.1 FIELD MEASUREMENTS*

Field data will be assessed by the Field Team Leader, who will review the field results for compliance with the established QC criteria that are specified in the FSAP and this QAPP. Accuracy of the field measurements will be assessed by using daily instrument calibration, calibration checks, and blanks. Data completeness will be calculated by using the following equation:

$$\% \text{ Completeness} = \frac{\text{Valid Data Obtained}}{\text{Total Data Planned}} \times 100$$

### *12.2 LABORATORY DATA*

Laboratory results will be assessed for compliance with the required precision, accuracy, completeness, and sensitivity as described in the following subsections.

#### *12.2.1 Precision*

The precision of laboratory analyses will be assessed for compliance with the established QC criteria discribed in Section 3.0 of this QAPP by comparing the analytical results of matrix spikes and matrix spike duplicates for organic analyses, and laboratory duplicate results for inorganic analyses. The relative percent difference (RPD) will be calculated for each pair of duplicate and investigative sample analyses by using the following equation:

$$RPD = \frac{|V_1 - V_2|}{V_1 + V_2} \times 100$$

Where:

$V_1$ = First sample value (original or MS value), and

$V^2$ = Second sample value (duplicate or MSD value).

*12.2.2* *Accuracy*

The accuracy of laboratory results will be assessed for compliance with the established QC criteria described in Section 3.0 of the QAPP by using the analytical results of method blanks, reagent/preparation blanks, and MS/MSD samples. The percent recovery (%R) of matrix spike samples will be calculated by using the following equation:

$$\%R = \frac{SPV - SAV}{SA} \times 100$$

Where:

SAV = The background value, value obtained by analyzing the sample.

SA = Concentration of spike added to sample.

SPV = Value obtained by analyzing the sample with the spike added..

*12.2.3* *Completeness*

The data completeness of laboratory analytical results will be assessed for

compliance with the amount of data required for decision making. The completeness is calculated using the equation given in Section 12.1.

*12.2.4* *Sensitivity*

The achievement of method detection limits depends on the instrument's sensitivity and matrix effects. Therefore, it is important to monitor the instrument's sensitivity to ensure the data quality through appropriate instrument performance. The instrument's sensitivity will be monitored through the analysis of method blanks, calibration check samples, and laboratory control samples.

## *13.0 CORRECTIVE ACTIONS*

### *13.1 GENERAL*

Corrective actions may be required for two classes of problems: sampling and analytical problems and noncompliance problems. Sampling and analytical problems may occur or be identified during sampling and sample handling, sample preparation, laboratory instrument analysis, and data review. For problems of noncompliance with the FSAP or this QAPP, a formal corrective action program will be defined in accordance with this QAPP and implemented at the time the problem is identified. The person who identifies the problem will be responsible for notifying the PM. No staff member will initiate a corrective action without prior communication of findings through the proper channels, as specified in the following subsections.

### *13.2 SAMPLE COLLECTION/FIELD MEASUREMENTS*

Technical staff and project personnel will be responsible for reporting all suspected technical or QA nonconformances, or suspected deficiencies of any activity or issued document to the PM or designee. The PM will be responsible for assessing the suspected problems in consultation with the Analytical QC Officer and the Clean Sites Project Manager and for making a decision on whether the situation will impact the quality of the data. If it is determined that the situation warrants a reportable nonconformance requiring corrective action, then a nonconformance report will be initiated by the PM.

The PM will be responsible for ensuring that corrective actions for nonconformances are initiated by:

- Evaluating all reported nonconformances.
- Controlling additional work on nonconforming items.
- Determining the disposition or action to be taken in consultation with the Clean Sites Project Manager.
- Maintaining a log of nonconformances.
- Reviewing nonconformance reports and corrective actions taken.
- Ensuring that nonconformance reports are included in the final evidence documentation in the project files.

If appropriate, the Field Team Leader will ensure that no additional work that is dependent on the nonconforming activity is performed until the corrective actions are completed.

Corrective actions for field measurements may include:

- Repeating the measurement to check the error.

- Checking all proper adjustments for ambient conditions such as temperature.
- Checking the batteries.
- Recalibrating the instrument.
- Checking the calibration.
- Replacing the instrument or measurement devices.
- Stopping work (if necessary).

All corrective actions will be documented in the field logbook.

The Field Team Leader will be responsible for all on-site activities. In this role, the Field Team Leader at times will be required to adjust the site programs to accommodate site-specific needs. When it becomes necessary to modify a program, the responsible person will notify the PM of the anticipated change and will implement the necessary changes after consulting with the Clean Sites Project Manager. The change in the program will be documented by the initiators and the Field Team Leader. The PM will be responsible for controlling, tracking, and implementing the identified changes. Reports on all changes will be distributed to all affected parties.

## *13.3 LABORATORY ANALYSES*

Corrective actions at the laboratories will be required whenever an out-of-control event or potential out-of-control event is noted. The investigative action taken will be somewhat dependent on the analyses and the event. Laboratory personnel will be alerted that corrective actions may be necessary if:

- Samples arrive in a damaged state or with broken custody seals.
- QC data are outside of the acceptable windows for precision and accuracy.
- Blanks contain target analytes above acceptable levels.
- Undesirable trends are detected in spike recoveries or RPD between duplicates.
- There are unusual changes in detection limits.
- Deficiencies are detected by the laboratory's QA department during internal or external audits or indicated by the results of performance evaluation samples.
- Reanalysis is necessary and insufficient sample volume is available.

- Inquiries concerning data quality are received.

Specific laboratory corrective action procedures for Savannah Laboratories are included in Appendix A of this QAPP. Corrective action procedures will often be handled at the bench level by the analyst, who will review the preparation or extraction procedure for possible errors, check the instrument calibration, spike and calibration mixes, and instrument sensitivity, etc. If the problem persists or cannot be identified, the matter will be referred to the laboratory supervisor, LPM, and/or QA department for further investigation. Once resolved, full documentation of the corrective action procedure will be filed with the QA department. If the problem requires resampling or is not correctable in the laboratory, the laboratory QAO will notify the PM, who will decide, in consultation with the Clean Sites Project Manager, the corrective actions to be implemented. If samples arrive at the laboratory with broken custody seals, the laboratory QAO will record all samples affected and notify the Field Team Leader. During data validation, all results of analyses for samples arriving at the laboratory with broken seals will be flagged. The qualifier used for samples with broken seals will be clearly defined as qualifying the source of the data and not the quality of the data.

## *14.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT*

The QA forms included in the data package, the laboratories certification of audit performance and the field audit reports will form the basis of the QA report that will be provided by ERM-Southeast as part of the RD report. The QA report will: (1) contain information that summarizes the QA activities in both the field and the laboratory, including audit results and sample bottle certification documentation; (2) discuss any quality issues that required corrective action and document the corrective action that has been taken; and (3) note any project problems that have resulted and any QA/QC issues that have been satisfactorily completed. Any problems serious enough to require significant actions (e.g., changing an approved SOP) will be reported to the ERM-Southeast and the Clean Sites Project Manager within five days of the occurrence.

# QAPP APPENDIX A

## Savannah Laboratories and Environmental

## Comprehensive Quality Assurance

# COMPREHENSIVE QUALITY ASSURANCE PLAN

Prepared by and for:

Savannah Laboratories and Environmental Services, Inc.


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305-421-7400

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2846 Industrial Plaza Drive
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Tampa Bay Division
6712 Benjamin Road, Suite 100
Tampa, FL 33634
813-885-7427

Mobile Division
900 Lakeside Drive
Mobile, AL 36609
205-666-6633

New Orleans Division
110 Alpha Drive
Destrehan, LA 70047
504-764-1100


May, 1994

## 2.0 TABLE OF CONTENTS


| SECTION | | NUMBER OF PAGES | REV. | DATE |
|---|---|---|---|---|
| 1.0 | Title and Signature Page | 1 | 1 | 5/94 |
| 2.0 | Table of Contents | 4 | 1 | 5/94 |
| 3.0 | Statement of Policy | 1 | 1 | 5/94 |
| 4.0 | Project Organization and Responsibility | 11 | 1 | 5/94 |
| 5.0 | Quality Assurance Objectives (Precision, Accuracy, and MDLs) | 113 | 1 | 5/94 |
| 6.0 | Sampling Procedures | 25 | 1 | 5/94 |
| 7.0 | Sample Custody | 21 | 1 | 5/94 |
| 8.0 | Analytical Procedures | 8 | 1 | 5/94 |
| 9.0 | Calibration Procedures and Frequency | 19 | 1 | 5/94 |
| 10.0 | Preventive Maintenance | 7 | 1 | 5/94 |
| 11.0 | Quality Control Checks and Routines To Assess Precision and Accuracy and Calculations of Method Detection Limits | 10 | 1 | 5/94 |
| 12.0 | Data Reduction, Review and Reporting | 31 | 1 | 5/94 |
| 13.0 | Corrective Action | 4 | 1 | 5/94 |
| 14.0 | Performance and System Audits | 5 | 1 | 5/94 |
| 15.0 | Quality Assurance Reports | 2 | 1 | 5/94 |

LIST OF FIGURES


| FIGURE | DESCRIPTION | PAGE | REVISION | DATE |
|---|---|---|---|---|
| 4.1 | Corporate Organizational Structure | 4.5 | 1 | 5/94 |
| 4.2 | Organizational Structure of Savannah Division Laboratory | 4.6 | 1 | 5/94 |
| 4.3 | Organizational Structure of Tallahassee Division Laboratory | 4.7 | 1 | 5/94 |
| 4.4 | Organizational Structure of Mobile Division Laboratory | 4.8 | 1 | 5/94 |
| 4.5 | Organizational Structure of Deerfield Beach Division Laboratory | 4.9 | 1 | 5/94 |
| 4.6 | Organizational Structure of Tampa Bay Division Laboratory | 4.10 | 1 | 5/94 |
| 4.7 | Organizational Structure of New Orleans Division Laboratory | 4.11 | 1 | 5/94 |
| 6.1 | Sample and Container Label | 6.18 | 1 | 5/94 |
| 6.2 | Monitoring Well Sampling Log Form | 6.19 | 1 | 5/94 |
| 6.3 | Custody Form | 6.20 | 1 | 5/94 |
| 7.1 | Custody Form | 7.2 | 1 | 5/94 |
| 7.2 | Sample and Container Label | 7.3 | 1 | 5/94 |
| 7.3 | Container Preparation Log | 7.5 | 1 | 5/94 |
| 7.4 | Custody Seal | 7.6 | 1 | 5/94 |
| 7.5 | Sample Custody Excursion | 7.7 | 1 | 5/94 |
| 7.6 | Sample Registry Form | 7.9 | 1 | 5/94 |
| 7.7 | Cooler Receipt Form | 7.12 | 1 | 5/94 |
| 7.8 | Sample Container Request Form (obverse) | 7.13 | 1 | 5/94 |
| 7.9 | Sample Container Request Form (reverse) | 7.14 | 1 | 5/94 |
| 7.10 | Fluoride Extraction Log | 7.16 | 1 | 5/94 |
| 7.11 | Fluoride Analysis Log | 7.17 | 1 | 5/94 |
| 7.12 | Semivolatile Extract Custody Log | 7.18 | 1 | 5/94 |

| FIGURE | DESCRIPTION | PAGE | REVISION | DATE |
|---|---|---|---|---|
| 11.1 | Quality Control Chart - Accuracy (% Recovery) | 11.8 | 1 | 5/94 |
| 11.2 | Quality Control Chart - Precision (% RPD) | 11.9 | 1 | 5/94 |
| 12.1 | Flow Diagram of Computerized Laboratory Information Management Systems (LIMS) | 12.2 | 1 | 5/94 |
| 12.2 | Result Only Report | 12.11 | 1 | 5/94 |
| 12.3 | SL Level I Report | 12.16 | 1 | 5/94 |
| 12.4 | SL Level II Report | 12.23 | 1 | 5/94 |
| 13.1 | Nonconformance Report (NCR) Form | 13.3 | 1 | 5/94 |
| 14.1 | Laboratory Internal Systems Audit Checklist | 14.3 | 1 | 5/94 |
| 14.2 | Field Internal Systems Audit Checklist | 14.4 | 1 | 5/94 |

## LIST OF TABLES


| DESCRIPTION OF TABLES | | PAGE | REVISION | DATE |
|---|---|---|---|---|
| 5.1 | Analytical Methods and Quality Assurance Objectives for Water | 5.3 | 1 | 5/94 |
| 5.2 | Analytical Methods and Quality Assurance Objectives for Soils and Sediments | 5.73 | 1 | 5/94 |
| 5.3 | Field Methods and Quality Assurance Objectives | 5.109 | 1 | 5/94 |
| 6.1 | Container Preservation Techniques and Holding Times for Water Samples | 6.8 | 1 | 5/94 |
| 6.2 | Container Preservation Techniques and Holding Times for Soil or Sediment Samples | 6.14 | 1 | 5/94 |
| 6.3 | Approved Water and Wastewater Procedures, Containers, Preservation and Holding Times for Parameters Not Found in 40 CFR 136 | 6.15 | 1 | 5/94 |
| 6.4 | Field Reagent Storage and Transport | 6.21 | 1 | 5/94 |
| 8.1 | Reagent Storage | 8.5 | 1 | 5/94 |
| 8.2 | Waste Disposal Procedures | 8.7 | 1 | 5/94 |
| 9.1 | Laboratory Instruments | 9.2 | 1 | 5/94 |
| 9.2 | Field Instruments | 9.6 | 1 | 5/94 |
| 9.3 | Standard Source and Preparation | 9.7 | 1 | 5/94 |
| 9.4 | Standardization of Titrating Solutions | 9.10 | 1 | 5/94 |
| 10.1 | Laboratory Equipment Preventive Maintenance Schedule | 10.2 | 1 | 5/94 |
| 10.2 | Field Equipment Preventive Maintanance Schedule | 10.6 | 1 | 5/94 |
| 10.3 | Balance Calibration Checks | 10.7 | 1 | 5/94 |
| 11.1 | Methods Used to Generate Accuracy and Precision Targets | 11.10 | 1 | 5/94 |
| 12.1 | Summary of Equations Used in Calculations | 12.4 | 1 | 5/94 |
| 13.1 | Corrective Action | 13.4 | 1 | 5/94 |

## 3.0 STATEMENT OF POLICY

Savannah Laboratories is committed to providing quality data and will endeavor to use good quality control and quality assurance practices for all field sampling and laboratory analytical procedures in order to ensure the best possible precision, accuracy, and representativeness of results from testing of environmental samples.

The objectives of the QA program are to:

(1) Properly collect, preserve, and store all samples;

(2) Maintain adequate custody records from sample collection through reporting and archiving of results;

(3) Use properly trained analysts to analyze all samples by approved methods and within holding times;

(4) Produce defensible data with associated documention to show that each system was calibrated and operating within precision and accuracy control limits;

(5) Accurately calculate, check, and report all data using the Laboratory Information Management System; and

(6) Document all the above activities in order that all data can be independently validated.

Savannah Laboratories intends to follow all procedures referenced in this plan and to conform to EPA and state regulatory agency guidelines for each project reported. Any changes in EPA or other regulatory procedures will be incorporated during periodic revisions of this plan.

Adherence to the procedures of this plan is assured by the assignment of an experienced project manager to each project. The project manager coordinates and is responsible for all phases of Savannah Laboratories' involvement in the project, including pre-project planning, sample bottle preparation, field sampling, computer entry of work, approving analytical and quality control data, final review of report, and discussion of results with client. The project managers are assisted by QA managers and QC staff at each laboratory.

The QA Plan will be utilized by all six Savannah Laboratories facilities. Additionally, all labs use identical standard operating procedures (SOPs), and all data are incorporated into a single Laboratory Information Management System (LIMS) network which generates common QC limits, etc., and is accessible to all employees. Each project is directed by a single project manager who directs all employees involved on the project, and also reviews, approves, and signs all data reports.

The following sections of this QA plan detail the organizational structures and procedures through which all laboratory results are generated.

## 4.0 ORGANIZATION AND RESPONSIBILITY

Savannah Laboratories and Environmental Services, Inc. has laboratory facilities in, and conducts field operations from, Savannah, Georgia; Tallahassee, Florida; Mobile, Alabama; Deerfield Beach, Florida; Tampa, Florida; and New Orleans, Louisiana. All six facilities are structured under a common administrative, data management, and quality assurance (QA) system as outlined in Figures 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, and 4.7.

Duties of the key personnel are as follows:

A) Company President

1) Establish corporate policy;

2) Plan and oversee laboratory infrastructure construction/ acquisition;

3) Negotiate contractual agreements; and

4) Other administrative and budgetary functions.

B) Company Vice President

1) Provide guidance to lab directors;

2) Establish and maintain company-client relationships; and

3) Assist president in establishing and carrying out corporate policy.

C) Secretary/Comptroller

1) Coordinate risk management and insurance program;

2) Prepare financial reports;

3) Coordinate Human Resources payroll section;

4) Keep corporate minutes and records; and

5) Review contracts and subcontracts.

D) Treasurer

1) Prepare financial reports and cost accounting reports;

2) Coordinate purchasing, accounts payable and accounting sections;

3) Assist corporate officers with budgetary problems;

4) Maintain equipment and facilities inventory; and

5) Coordinate maintenance program.

E) Corporate Technical Staff

1) Provide technical support for all divisions;

2) Coordinate QA/QC and technical activities affecting all divisions;

3) Write SOPs and other technical documents; and

4) Inform all divisions about method changes.

F) Marketing Director

1) Coordinate corporate marketing efforts with laboratory director, project managers, and marketing department;

2) Assist executive officer in defining corporate marketing policy;

3) Coordinate proposal process; and

4) Schedule trade shows.

G) Corporate Administrative Staff

1) Manage Accounting, Human Resources, and other corporate departments;

2) Coordinate business managers;

3) Manage corporate-wide environmental and safety programs; and

4) Assist corporate officers on all administrative, safety and environmental issues.

H) Laboratory Director

1) Responsible for day-to-day operation of lab;

2) Provide project manager guidance;

3) Establish production priorities; and

4) Approve hiring decisions.

I) Project Manager

1) Initial contact with client on individual job tasks;

2) Prepare all work plans, schedules and manpower allocations;

3) Initiate all procurement for the projects;

4) Day-to-day direction of the project team including analytical department managers/supervisors/QA personnel, field sampling crews and data management personnel;

5) Coordinate financial and contractual aspects of the projects;

6) Provide formatting and technical review of all reports;

7) Provide day-to-day communication with the client;

8) Exercise final review and approval on all reports and invoices for the project; and

9) Respond to post project inquiries.

J) QA Manager

1) Coordinate with the project manager, and laboratory managers in order to ensure that project QA is maintained;

2) Be available to discuss QA activities and results with project managers;

3) Prepare QA reports to management;

4) Perform periodic system audits;

5) Review not-in-compliance reports and approve corrective actions;

6) Coordinate the preparation and approval of all QA plans, method SOPs and QA audit responses; and

7) Coordinate and be present during all external QA Audits.

K) Laboratory Manager

1) Coordinate all production activities;

2) Work with project managers to ensure project objectives are met;

3) Provide guidance to department managers; and

4) Interview and hire technical personnel.

L) Sample/Data Manager

1) Schedule bottle orders and supervise bottle prep staff;

2) Supervise custody staff;

3) Coordinate with project manager and field/sampling manager on scheduling field sampling efforts;

4) Identify and document custody discrepancies and communicate with client on custody problems; and

5) Supervise data management staff including computer login, data entry, report preparation, and data archiving personnel.

M) Field/Sampling Manager

1) Coordinate and schedule sampling crews;

2) Prepare sampling reports; and

3) Ensure sampling protocols are followed.

N) Department Manager

1) Organize work flow in department;

2) Assure adequate inventory of reagents and equipment;

3) Ensure effective maintenance and repair of instrumentation;

4) Investigate and evaluate new methodology and equipment; and

5) Train new employees.

O) Office Manager

1) Assist laboratory director with all administrative and financial activities;

2) Coordinate all procurement/receiving with corporate procurement department;

3) Coordinate posting of all invoices with corporate accounts receivable department;

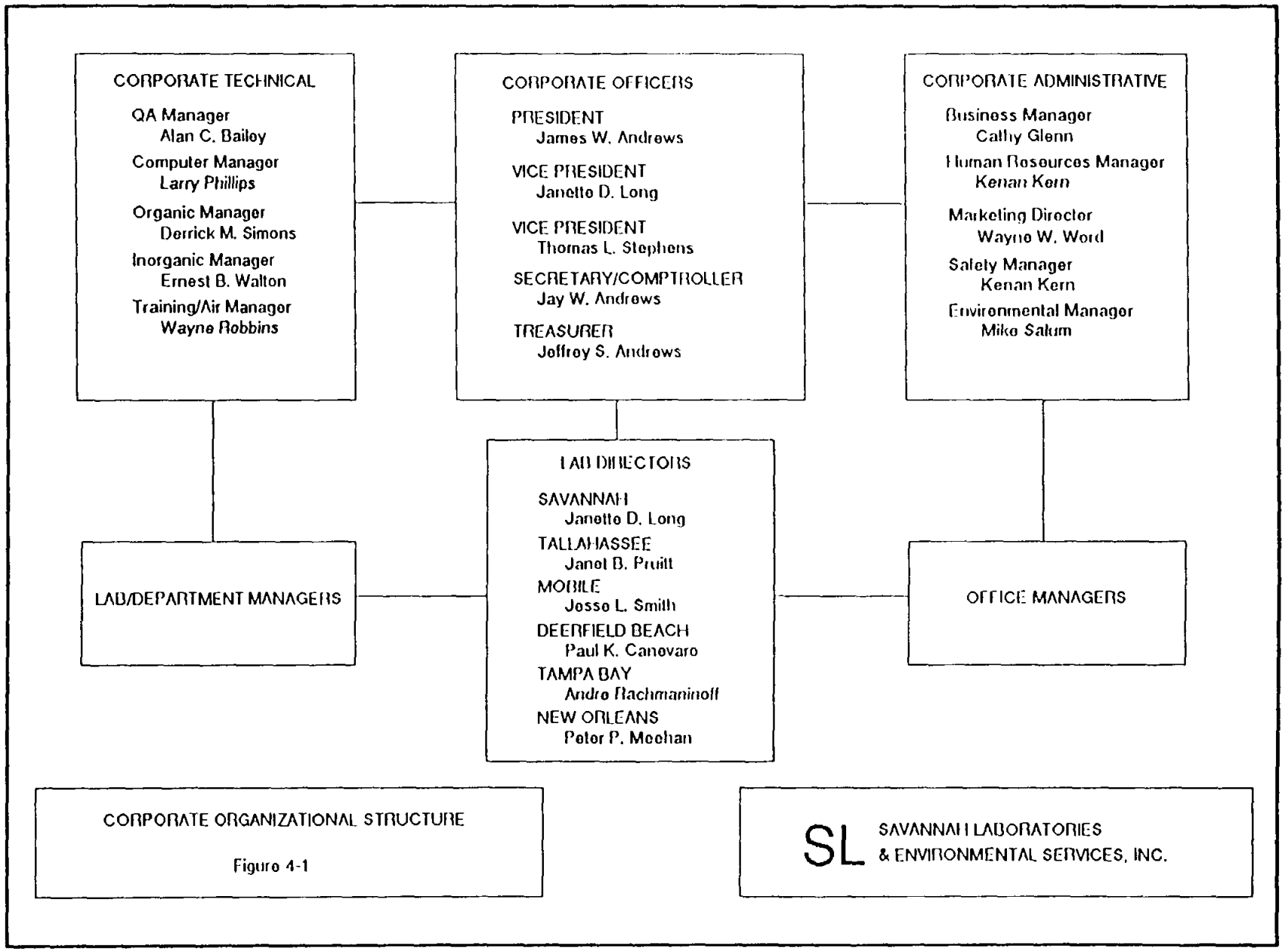
4) Assist comptroller and laboratory directors with collection of receivables;

5) Maintain inventory of all facilities and equipment;

6) Coordinate all human resources and payroll activities; and

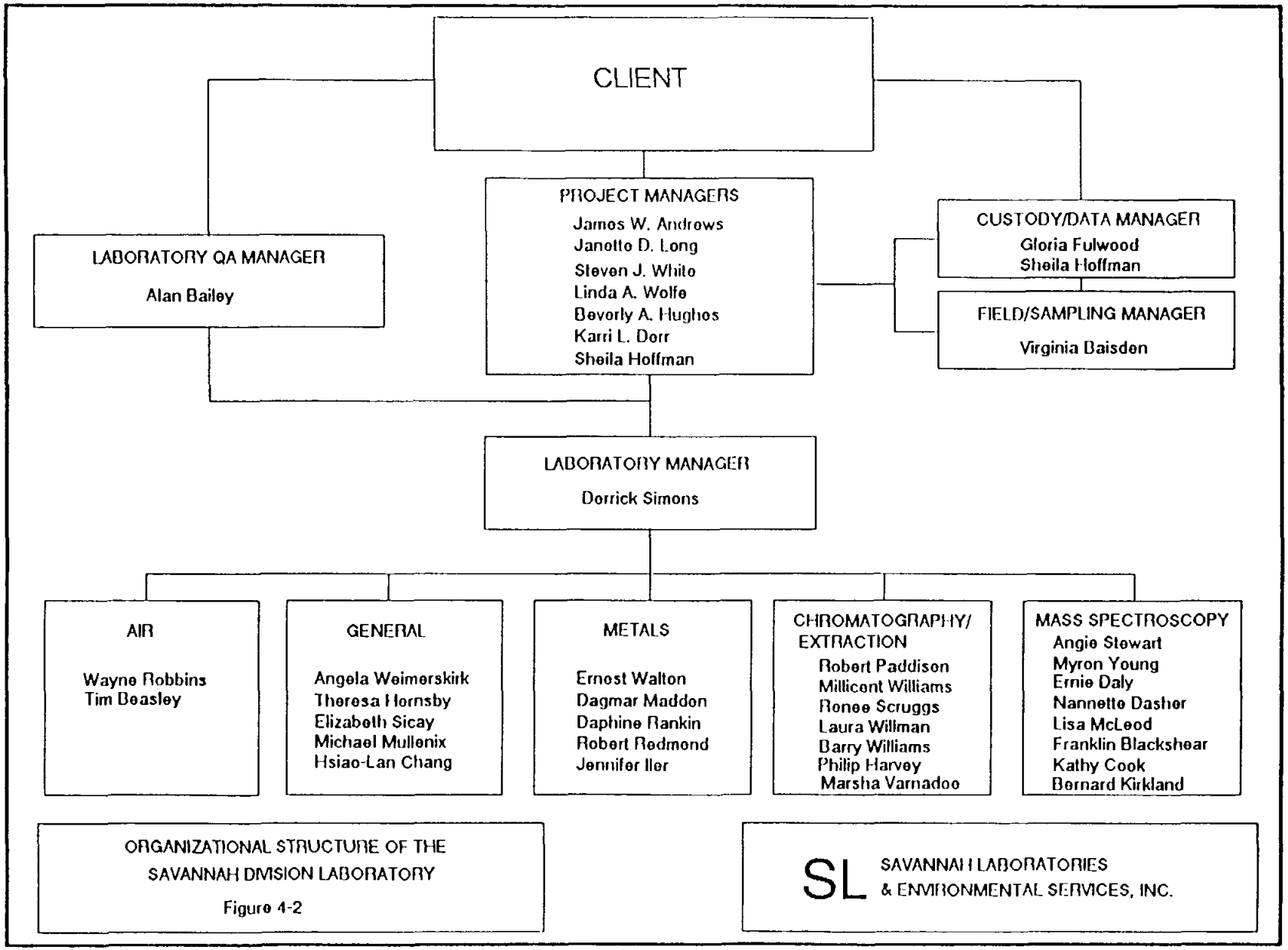
7) Maintain petty cash and coordinates laboratory expenditures with corporate accounting department.

In case of instrument failure, high sample volume, or rapid turnaround requirements, samples are interchanged among the six facilities. In these situations, samples or preserved extracts are transported under EPA recommended chain-of-custody, handling and storage procedures. This exchange of work is possible because of single administrative structure, the use of identical analytical and QA protocols, and the fact that all six facilities are tied into (via telephone modem) a central computerized Laboratory Information Management System (LIMS).




CORPORATE ORGANIZATIONAL STRUCTURE

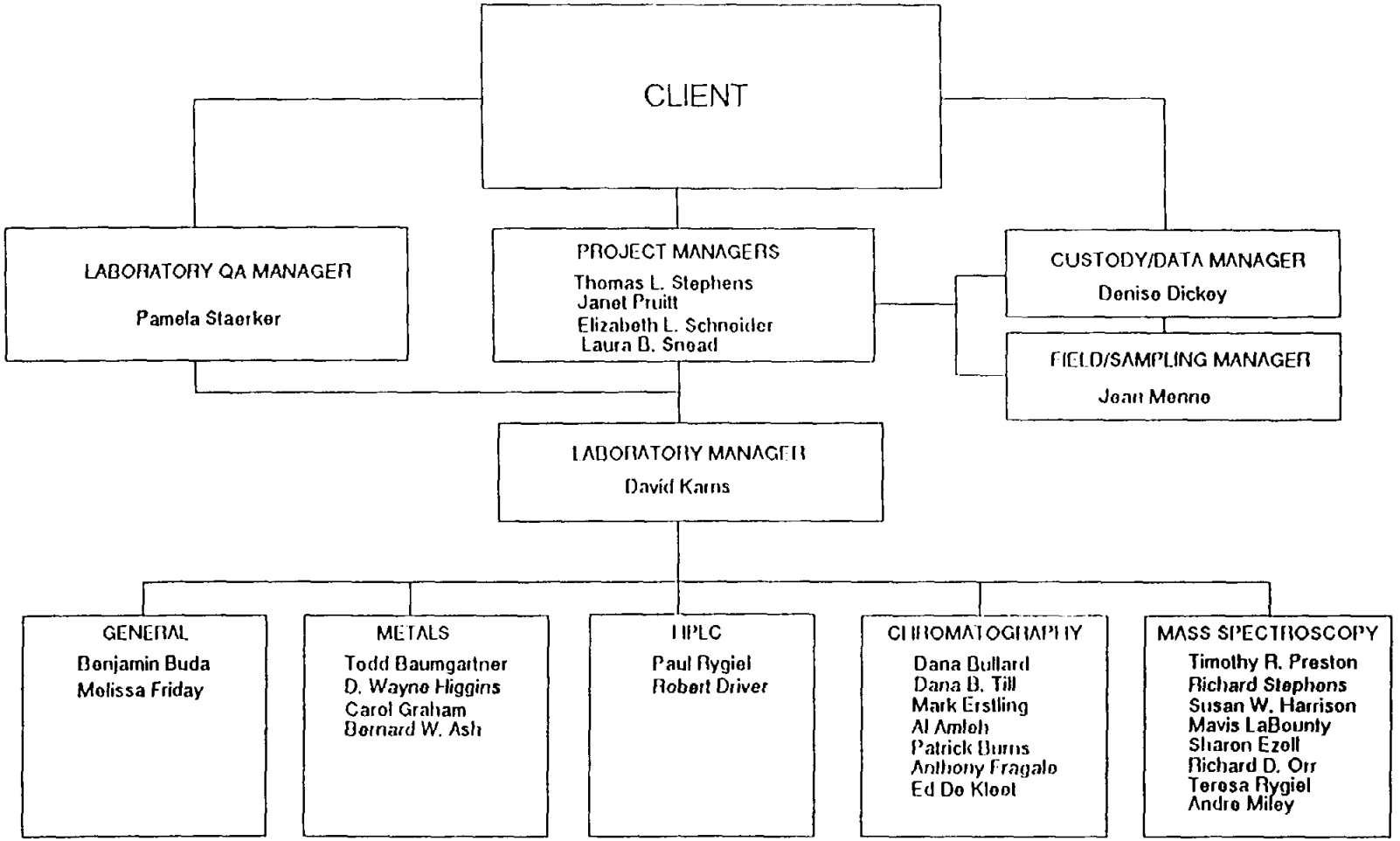
Figure 4-1




ORGANIZATIONAL STRUCTURE OF THE SAVANNAH DIVISION LABORATORY

Figure 4-2

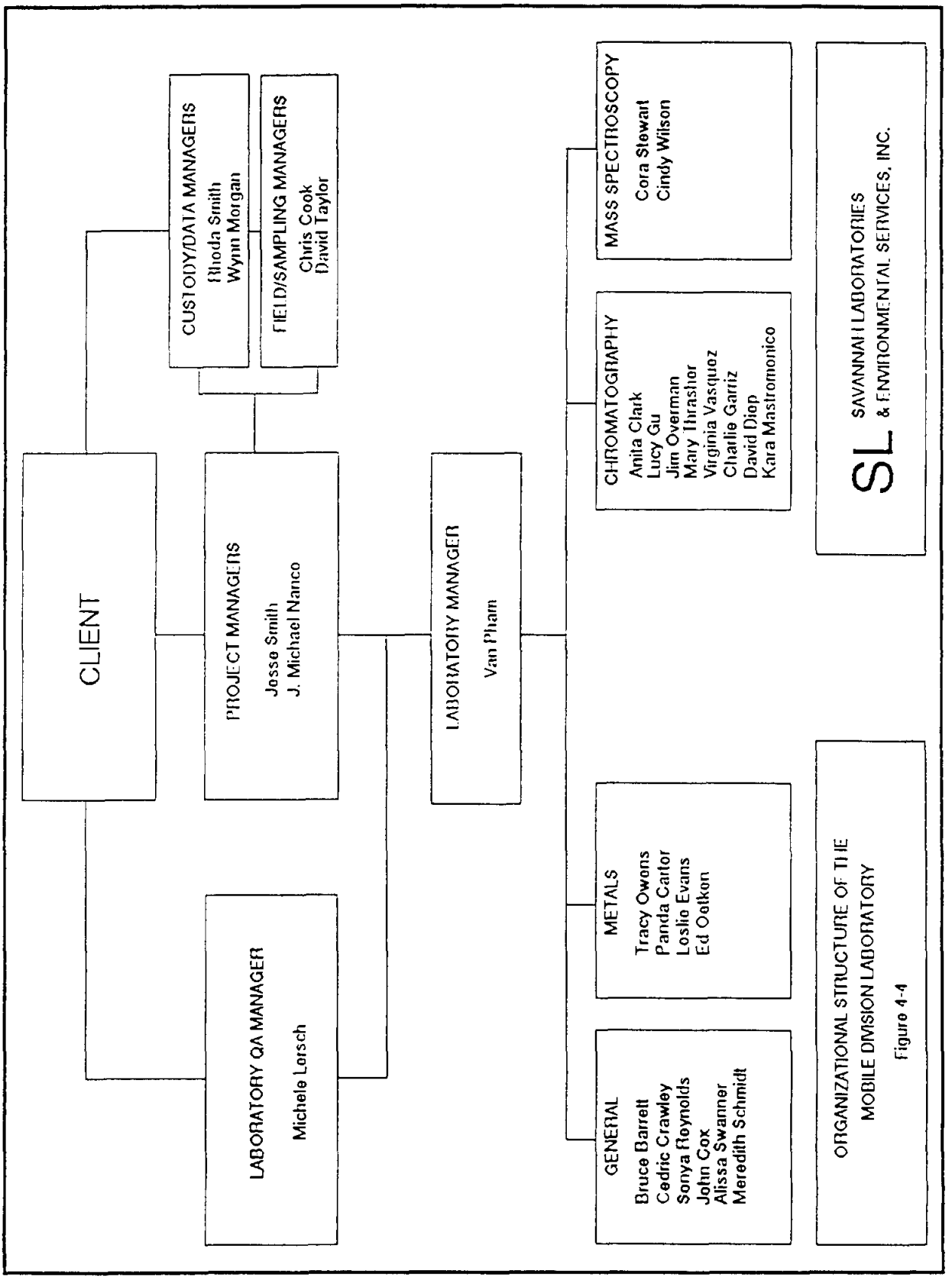
SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.




ORGANIZATIONAL STRUCTURE OF THE TALLAHASSEE DIVISION LABORATORY

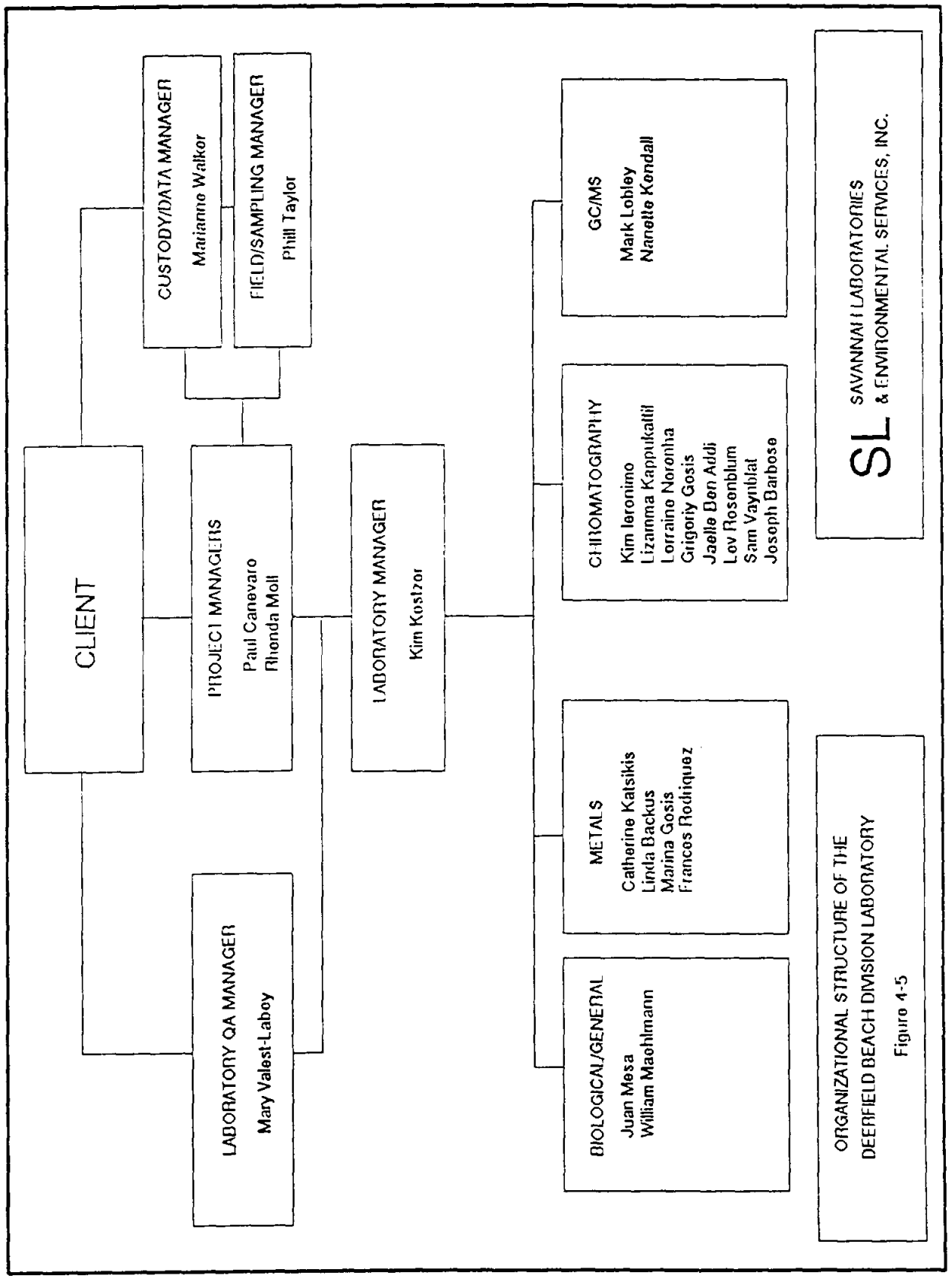
Figure 4-3

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.



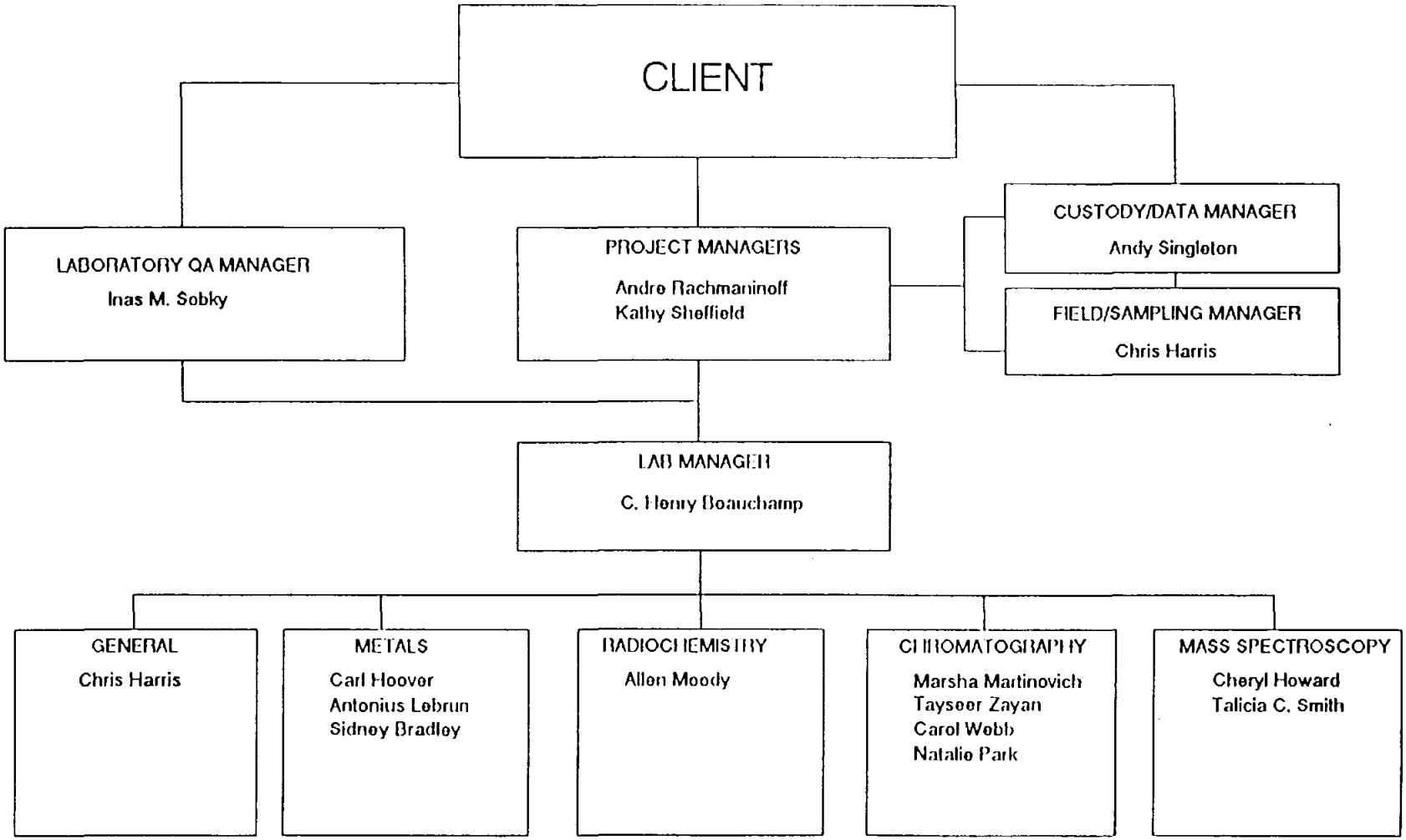

ORGANIZATIONAL STRUCTURE OF THE
MOBILE DIVISION LABORATORY

Figure 4-4




ORGANIZATIONAL STRUCTURE OF THE DEERFIELD BEACH DIVISION LABORATORY

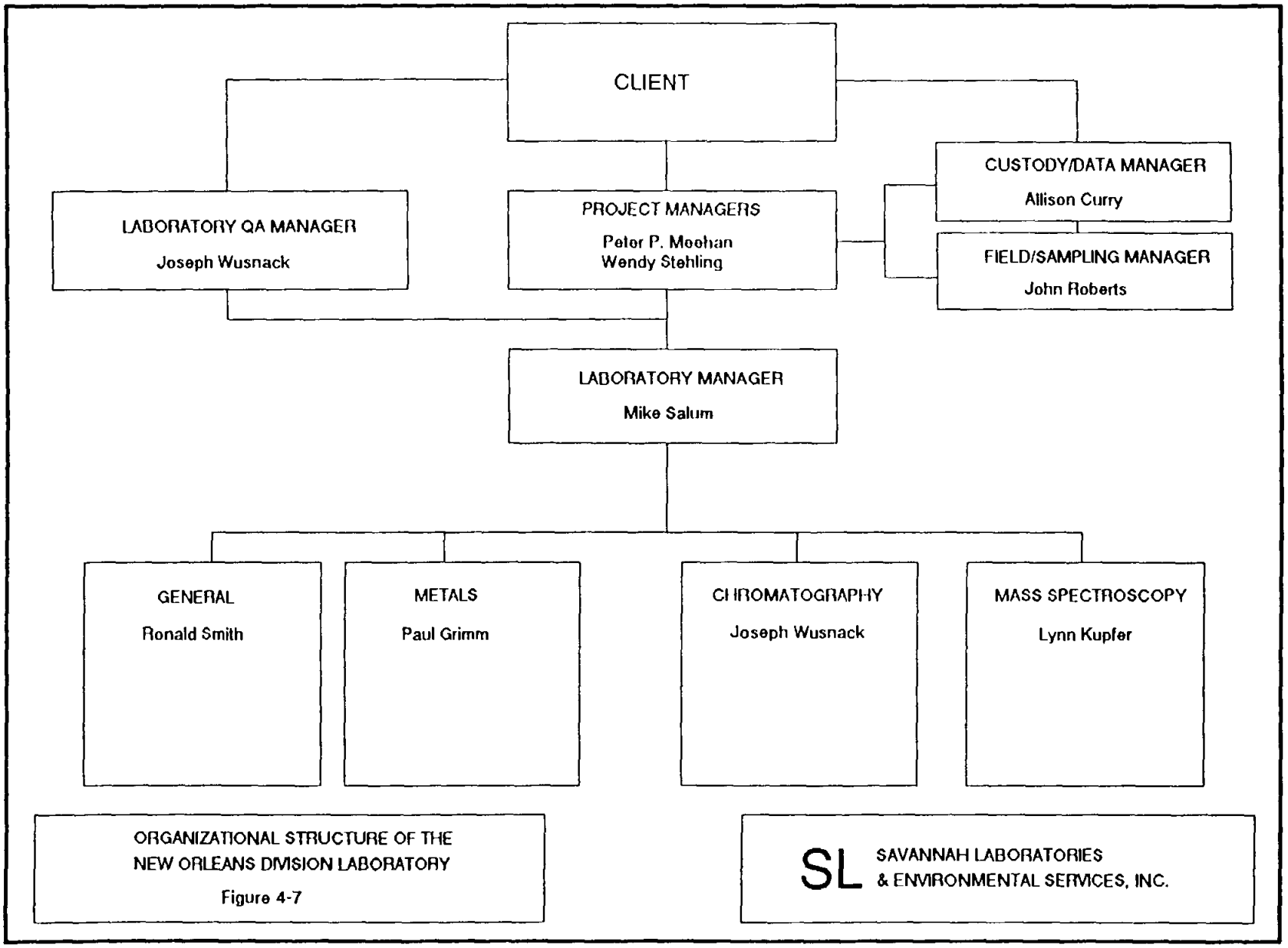
Figure 4-5




ORGANIZATIONAL STRUCTURE OF THE TAMPA DIVISION LABORATORY

Figure 4-6

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.




ORGANIZATIONAL STRUCTURE OF THE
NEW ORLEANS DIVISION LABORATORY

Figure 4-7

## 5.0 QUALITY ASSURANCE OBJECTIVES (PRECISION, ACCURACY, AND DETECTION LIMITS)

Savannah Laboratories has a comprehensive quality assurance program which is based on the program outlined in EPA's *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAMS-005/80)*, in the *Handbook for Analytical Quality Control in Water and Wastewater Laboratories* (EPA, 1979), Chapter 1, Final Update 1, (July 1992) of *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846), and in the Association of Official Analytical Chemists' *Quality Assurance Principles for Analytical Laboratories*.

The key to Savannah Laboratories QA/QC program is strict adherence to the program during all phases of the project including: presampling discussions; sample collection, preservation, transportation and storage; sample login and tracking; laboratory analyses; and validation and reporting of results.

Project and QC data from all facilities are entered into a single Laboratory Information Management System (LIMS). The LIMS provides a computerized mechanism for storing field and login information, tracking sample holding times, scheduling and preparing laboratory work sheets, storing results and QC data, reviewing results and relating them to their corresponding QC data, and printing reports and invoices. The project manager, QA manager, and data management and reporting personnel have direct access via a CRT terminal to all project and QA data from all six facilities.

Tables 5.1 and 5.2 list the laboratory parameters determined by Savannah Laboratories, the methodology, the QA objectives for precision, accuracy and the normal method detection limits (MDLs) for relatively clean environmental samples. Table 5.3 gives the same information for field parameters.

### PRECISION

Relative percent difference is used to express precision between two replicate values. In routine analyses, the values for most parameters are usually below quantitation limits; therefore, precision data are derived from duplicate matrix spike or lab control standard results.

The relative percent difference (RPD) is calculated as:

$$RPD = \frac{V1 - V2}{(V1 + V2)/2} \times 100$$

V1, V2 = The two values obtained by analyzing the duplicate samples.

### ACCURACY

Accuracy control limits are produced from spike data. Percent recovery is used to express accuracy.

The percent recovery (%R) is calculated as below:

$$\%R = \frac{SPV - SAV}{SA} \times 100$$

SAV - The background value, value obtained by analyzing the sample

SA - Concentration of the spike added to the sample

SPV - Value obtained by analyzing the sample with the spike added

COMPARABILITY

Savannah Laboratories strives for comparability of results through evaluation of data against established precision and accuracy limits. Strict adherence to QA/QC procedures promotes the comparability of one set of reference data to another or comparability of data among all facilities.

REPRESENTATIVENESS

The Savannah Laboratories objective for representativeness of field samples is to ensure that a set of data accurately depicts the chemical or biological characteristics of a sample source. Representativeness is enhanced by an attempt to mix samples prior to aliquot removal. Results are considered reliable and representative if the sample results distribution is within statistically defined bounds of the population mean and variance.

CLP PROTOCOL

For CLP protocol, accuracy and precision limits for matrix spikes, as well as detection limits (CRDLs), are specified by the Statement of Work. These specified limits are given with the CLP methods listed in Tables 5.1 and 5.2.

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMIT (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Aluminum | 6010(3010) | 3/2 | 75-125 | 0-20 | 27 | 200 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 20 | 200 |
| | Saltwater | 5 | 50-140 | 0-40 | 2.5 | 10 |
| | CLP | 45 | 80-120 | 0-20 | 200 | 200 |
| Antimony | 6010(3010***) | 3/2 | 75-125 | 0-20 | 15 | 50 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 15 | 50 |
| | 7041(3005) | 3/2 | 75-125 | 0-20 | 0.65 | 10 |
| | CLP | 45 | 80-120 | 0-20 | 60 | 60 |
| | 204.2 | 3/2 | 80-120 | 0-20 | 5.0 | 5.0 |
| Arsenic | 200.7 (4X) | 3/2 | 85-115 | 0-20 | 10 | 25 |
| | 6010(3010) | 3/2 | 75-125 | 0-20 | 26 | 100 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 23 | 100 |
| | 7060(3020***) | 3/2 | 75-125 | 0-20 | 1.7 | 10 |
| | 206.2 | 3/2 | 80-120 | 0-20 | 3.6 | 10 |
| | 206.3/7061 | 3/2 | 60-140 | 0-40 | 1.4 | 2.0 |
| | CLP | 45 | 80-120 | 0-20 | 10 | 10 |
| Barium | 6010(3010) | 3/2 | 75-125 | 0-20 | 1.2 | 10 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 0.68 | 10 |
| | CLP | 45 | 80-120 | 0-20 | 200 | 200 |
| Beryllium | 6010(3010) | 3/2 | 75-125 | 0-20 | 2.3 | 5.0 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 0.95 | 5.0 |
| | 7091(3020) | 3/2 | 75-125 | 0-20 | 1.2 | 5.0 |
| | CLP | 45 | 80-120 | 0-20 | 5.0 | 5.0 |
| | 210.2 | 3/2 | 80-120 | 0-20 | 1.3 | 5.0 |
| Boron | 6010(3010***) | 3/2 | 75-125 | 0-20 | 13 | 50 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 13 | 50 |
| Cadmium | 6010(3010) | 3/2 | 75-125 | 0-20 | 3.3 | 5.0 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 2.8 | 5.0 |
| | 7131(3020) | 3/2 | 75-125 | 0-20 | 0.065 | 1.0 |
| | Saltwater | 5 | 60-140 | 0-40 | 0.050 | 0.050 |
| | CLP | 45 | 80-120 | 0-20 | 5.0 | 5.0 |
| | 213.2 | 3/2 | 80-102 | 0-20 | 0.25 | 1.0 |
| Calcium | 6010(3010) | 3/2 | 75-125 | 0-20 | 26 | 500 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 48 | 500 |
| | CLP | 45 | 80-120 | 0-20 | 5000 | 5000 |
| Chromium | 6010(3010) | 3/2 | 75-125 | 0-20 | 7.6 | 10 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 4.6 | 10 |
| | 7191(3020) | 3/2 | 75-125 | 0-20 | 0.34 | 10 |
| | CLP | 45 | 80-120 | 0-20 | 10 | 10 |
| | 218.2 | 3/2 | 80-120 | 0-20 | 2.5 | 10 |
| Chromium, hexavalent | 7196 | 2 | 75-125 | 0-20 | 2.2 | 10 |
| Cobalt | 6010(3010) | 3/2 | 75-125 | 0-20 | 3.6 | 10 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 2.2 | 10 |
| | CLP | 45 | 80-120 | 0-20 | 50 | 50 |
| Copper | 200.7 (4X) | 3/2 | 85-115 | 0-20 | 2.5 | 6.0 |
| | 6010(3010) | 3/2 | 75-125 | 0-20 | 18 | 25 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 19 | 25 |
| | 220.1/220.2(3020) | 3 | 80-120 | 0-20 | 0.57 | 10 |
| | Saltwater | 5 | 60-140 | 0-40 | 0.50 | 0.50 |
| | CLP | 45 | 80-120 | 0-20 | 25 | 25 |
| Iron | 6010(3010) | 3/2 | 75-125 | 0-20 | 15 | 50 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 7.8 | 50 |
| | 236.2(3020) | 3 | 75-125 | 0-20 | 2.5 | 10 |
| | Saltwater | 5 | 60-140 | 0-40 | 2.0 | 2.0 |
| | CLP | 45 | 80-120 | 0-20 | 100 | 100 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMIT (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Lead | 6010(3010) | 3/2 | 75-125 | 0-20 | 11 | 50 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 11 | 50 |
| | 239.2 | 3/2 | 80-120 | 0-20 | 2.0 | 5.0 |
| | Saltwater | 5 | 60-140 | 0-40 | 0.50 | 0.50 |
| | CLP | 45 | 80-120 | 0-20 | 3.0 | 3.0 |
| | 7421(3020) | 3/2 | 75-125 | 0-20 | 0.33 | 5.0 |
| Lithium | 3500-Li B | 4 | 80-120 | 0-20 | 28 | 100 |
| Magnesium | 6010(3010) | 3/2 | 75-125 | 0-20 | 36 | 500 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 25 | 500 |
| | CLP | 45 | 80-120 | 0-20 | 5000 | 5000 |
| Manganese | 6010(3010) | 3/2 | 75-125 | 0-20 | 2.1 | 10 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 0.73 | 10 |
| | CLP | 45 | 80-120 | 0-20 | 15 | 15 |
| Mercury | 7470 | 3/2 | 75-125 | 0-20 | 0.087 | 0.20 |
| | Saltwater | 5 | 60-140 | 0-40 | 0.025 | 0.10 |
| | CLP | 45 | 80-120 | 0-20 | 0.20 | 0.20 |
| | 245.1 | 3/2 | 80-120 | 0-20 | 0.20 | 0.20 |
| Molybdenum | 6010(3010) | 4/2 | 75-125 | 0-20 | 6.4 | 10 |
| | 200.7 | 4/2 | 85-115 | 0-20 | 4.5 | 10 |
| Nickel | 200.7 (4X) | 3/2 | 85-115 | 0-20 | 3.6 | 10 |
| | 6010(3010) | 3/2 | 75-125 | 0-20 | 6.5 | 40 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 5.0 | 40 |
| | 249.2 | 3 | 75-125 | 0-20 | 0.25 | 10 |
| | Saltwater | 5 | 60-140 | 0-40 | 1.4 | 2.0 |
| | CLP | 45 | 80-120 | 0-20 | 40 | 40 |
| Phosphorus | 200.7*** | 3/2 | 85-115 | 0-20 | 50 | 50 |
| | 6010***(3010***) | 3/2 | 75-125 | 0-20 | 50 | 50 |
| Potassium | 6010(3010) | 3/2 | 75-125 | 0-20 | 670 | 1000 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 85 | 1000 |
| | 7610(3010) | 3/2 | 75-125 | 0-20 | 25 | 100 |
| | CLP | 45 | 80-120 | 0-20 | 5000 | 5000 |
| | 258.1 | 3/2 | 80-120 | 0-20 | 25 | 100 |
| Selenium | 6010(3010) | 3/2 | 75-125 | 0-20 | 91 | 500 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 20 | 500 |
| | 270.2 | 3/2 | 80-120 | 0-20 | 3.9 | 5.0 |
| | 270.3/7741 | 3/2 | 60-140 | 0-40 | 0.25 | 2.0 |
| | CLP | 45 | 80-120 | 0-20 | 5.0 | 5.0 |
| | 7740(3020***) | 3/2 | 75-125 | 0-20 | 1.7 | 10 |
| Silica | 6010(3010***) | 3/2 | 75-125 | 0-30 | 120 | 500 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 120 | 500 |
| Silver | 6010(3010***) | 3/2 | 75-125 | 0-20 | 6.0 | 10 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 2.9 | 10 |
| | 272.1 | 3 | 80-120 | 0-20 | 2.5 | 10 |
| | 7761 | 3/2 | 75-125 | 0-20 | 0.25 | 1.0 |
| | Saltwater | 5 | 60-140 | 0-40 | 0.050 | 0.050 |
| | CLP | 45 | 80-120 | 0-20 | 10 | 10 |
| | 272.2 | 3/2 | 80-120 | 0-20 | 0.25 | 1.0 |
| Sodium | 6010(3010) | 3/2 | 75-125 | 0-20 | 14 | 500 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 19 | 500 |
| | 273.1 | 3 | 75-125 | 0-20 | 125 | 500 |
| | CLP | 45 | 80-120 | 0-20 | 5000 | 5000 |
| Strontium | 200.7*** | 3/2 | 85-115 | 0-20 | 0.54 | 10 |
| | 6010***(3010***) | 3/2 | 75-125 | 0-20 | 1.1 | 10 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMIT (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Thallium | 6010(3010) | 3/2 | 75-125 | 0-20 | 64 | 500 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 92 | 500 |
| | 279.2 | 3/2 | 80-120 | 0-20 | 3.5 | 10 |
| | CLP | 45 | 80-120 | 0-20 | 10 | 10 |
| | 7841(3020) | 3/2 | 75-125 | 0-20 | 0.53 | 10 |
| Tin | 200.7*** | 3/2 | 85-115 | 0-20 | 15 | 50 |
| | 282.2 | 3 | 75-125 | 0-20 | 10 | 50 |
| | 6010***V | 3/2 | 75-125 | 0-20 | 10 | 50 |
| Titanium | 200.7*** | 3/2 | 85-115 | 0-20 | 2.2 | 10 |
| | 6010***(3010***) | 3/2 | 75-125 | 0-20 | 2.2 | 10 |
| Tributyl tin | Atomic absorption | 40 | 60-140 | 0-40 | 0.0010 | 0.0010 |
| Vanadium | 6010(3010) | 3/2 | 75-125 | 0-20 | 2.5 | 10 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 2.2 | 10 |
| | CLP | 45 | 80-120 | 0-20 | 50 | 50 |
| Zinc | 6010(3010) | 3/2 | 75-125 | 0-20 | 7.5 | 20 |
| | 200.7 | 3/2 | 85-115 | 0-20 | 5.9 | 20 |
| | Saltwater | 5 | 60-140 | 0-40 | 0.25 | 1.0 |
| | CLP | 45 | 80-120 | 0-20 | 20 | 20 |
| Zinc Phosphide | FDER Special Method | 31 | 10-210 | 0-80 | 0.50 | 0.50 |
| Zirconium | 6010***(3010***) | 2 | 75-125 | 0-20 | 1100 | 5000 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (mg/L) | Reporting Limit (mg/L) |
|---|---|---|---|---|---|---|
| Acetate | 300.0 | 3 | 75-125 | 0-30 | 0.25 | 1.0 |
| Acidity | 305.1/2310 | 3/4 | 75-125 | 0-30 | 2.5 | 10 |
| Alkalinity | 310.1/2320 | 3/4 | 75-125 | 0-30 | 0.12 | 1.0 |
| Ammonia (as N) | 350.1<br>350.3 | 3<br>3 | 90-110<br>75-125 | 0-30<br>0-30 | 0.0099<br>0.028 | 0.030<br>0.050 |
| Ammonia, un-ionized | FL-DER | 60 | NA | NA | NA | 0.010 |
| Bicarbonate | 4500-$CO_2$ D | 4 | NA | NA | NA | 1.0 |
| BOD | 405.1/5210 | 3/4 | 60-140 | 0-30 | 0.41 | 2.0 |
| Bromate | 300.0 | 3 | 75-125 | 0-30 | 0.25 | 1.0 |
| Bromide | 9056/300.0<br>320.1 | 2/3<br>3 | 75-125<br>75-125 | 0-30<br>0-30 | 0.10<br>0.50 | 1.0<br>2.0 |
| Carbon, total organic | 415.1/9060 | 3/2 | 60-140 | 0-40 | 0.46 | 1.0 |
| Carbonate | 4500-$CO_2$ D | 4 | NA | NA | NA | 1.0 |
| CBOD | 5210 | 4 | NA | 0-30 | NA | 2.0 |
| Chloride | 325.2<br>325.3/9252<br>4500-$Cl^-$ C<br>9056/300.0 | 3<br>3/2<br>4<br>2/3 | 85-115<br>75-125<br>75-125<br>75-125 | 0-30<br>0-30<br>0-30<br>0-30 | 0.24<br>0.54<br>0.25<br>0.19 | 1.0<br>1.0<br>1.0<br>1.0 |
| Chlorine, residual | 4500-Cl B<br>330.2/330.3/330.4/330.5 | 4<br>3 | NA<br>NA | 0-30<br>0-30 | NA<br>NA | 1.0<br>1.0 |
| Chlorate | 300.0 | 3 | 75-125 | 0-30 | 0.025 | 0.10 |
| Chlorite | 300.0 | 3 | 75-125 | 0-30 | 0.025 | 0.10 |
| Chlorophyll | 10200H | 4 | NA | 0-30 | NA | 0.00010 |
| COD | 5220C<br>410.1<br>410.2<br>410.4 | 4<br>3<br>3<br>3 | 60-140<br>60-140<br>60-140<br>60-140 | 0-30<br>0-30<br>0-30<br>0-30 | 11<br>5.0<br>5.0<br>5.0 | 20<br>20<br>20<br>20 |
| Coliform, fecal, MPN | 9221C | 4 | NA | 0-200 | NA | 2 MPN/100 mL |
| Coliform, fecal, MF | 9222D | 4 | NA | 0-200 | NA | 1 col/100 mL |
| Coliform, total, MPN | 9221B | 4 | NA | 0-200 | NA | 2 MPN/100 mL |
| Coliform, total, MF | 9222B | 4 | NA | 0-200 | NA | 1 col/100 mL |
| Color | 110.2/2120B | 3/4 | NA | 0-40 | NA | 5 PCU |
| Corrosivity | 2330B | 4 | NA | NA | NA | NA |
| Cyanate | 4500-CN L | 4 | 60-140 | 0-40 | 0.025 | 0.10 |
| Cyanide, amenable to chlorination | 9012<br>335.1/9010 | 2<br>3/2 | NA<br>NA | 0-50<br>0-40 | NA<br>NA | 0.010<br>0.010 |
| Cyanide, reactive | 7.3.3.2 | 2 | NA | 0-50 | NA | 0.010 |
| Cyanide, total | 335.3/9012<br>335.2/9010<br>CLP | 3/2<br>3/2<br>45 | 85-115<br>75-125<br>85-115 | 0-30<br>0-30<br>0-30 | 0.0016<br>0.0056<br>0.010 | 0.010<br>0.010<br>0.010 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (mg/L) | Reporting Limit (mg/L) |
|---|---|---|---|---|---|---|
| Cyanide, weak and dissociable | 4500-CN I | 4 | NA | 0-30 | NA | 0.010 |
| Fluoride | 340.2 | 3 | 75-125 | 0-30 | 0.023 | 0.20 |
| Formate | 300.0 | 3 | 75-125 | 0-30 | 0.25 | 1.0 |
| Halogens, total organic | 450.1/9020 | 3/2 | 60-140 | 0-40 | 0.0053 | 0.010 |
| Hardness, total | 2340B<br>120.2 | 4<br>3 | NA<br>75-125 | NA<br>0-30 | NA<br>0.25 | 3.3<br>1.0 |
| Hydrogen ion (pH) | 150.1/9040 | 3/2 | 90-110 | 0-10 | NA | NA |
| Iodide | 300.0 | 3 | 75-125 | 0-30 | 1.2 | 5.0 |
| Nitrate (as N) | 353.2<br>9056/300.0<br>352.1<br>353.3 | 3<br>2/3<br>3<br>3 | 88-115<br>75-125<br>75-125<br>75-125 | 0-30<br>0-30<br>0-30<br>0-30 | NA<br>0.066<br>0.025<br>NA | 0.050<br>0.10<br>0.10<br>0.050 |
| Nitrate-Nitrite (as N) | 353.2<br>353.3 | 3<br>3 | 85-115<br>75-125 | 0-30<br>0-30 | 0.0098<br>0.015 | 0.050<br>0.050 |
| Nitrite (as N) | 353.2 (w/o Cd redn)<br>354.1<br>9056/300.0<br>353.3 (w/o Cd redn) | 3<br>3<br>2/3<br>3 | 85-115<br>75-125<br>75-125<br>75-125 | 0-30<br>0-30<br>0-30<br>0-30 | 0.0068<br>0.015<br>0.044<br>0.013 | 0.050<br>0.050<br>0.050<br>0.050 |
| Nitrogen, total Kjeldahl (TKN) | 351.2<br>351.3 | 3<br>3 | 65-135<br>75-125 | 0-40<br>0-30 | 0.068<br>0.050 | 0.10<br>0.10 |
| Nitrogen, organic | EPA-CE: 3-305 | 46 | NA | NA | NA | 0.10 |
| Nitrogen, total | TKN + $NO_2/NO_3$ | 2/3 | NA | NA | NA | 0.15 |
| Odor | 140.1/2150 | 3/4 | NA | NA | NA | 1 TON |
| Oil & Grease | 413.1/5520B<br>413.2/5520C | 3/4<br>3/4 | 60-140<br>60-140 | 0-30<br>0-30 | 2.3<br>0.14 | 5.0<br>1.0 |
| Orthophosphate (as P) | 365.1<br>365.2<br>365.3<br>9056/300.0 | 3<br>3<br>3<br>2/3 | 80-120<br>75-125<br>75-125<br>75-125 | 0-30<br>0-30<br>0-30<br>0-30 | 0.0059<br>0.0072<br>0.013<br>0.071 | 0.050<br>0.050<br>0.050<br>0.10 |
| Oxalate | 300.0 | 3 | 75-125 | 0-30 | 0.25 | 1.0 |
| Oxygen, dissolved | 360.1 | 3 | NA | 0-30 | NA | 0.10 |
| Petroleum hydrocarbons | 418.1/5520F | 3/4 | 60-140 | 0-30 | 0.34 | 1.0 |
| Phenolics, total recoverable | 420.2/9066<br>420.1/9065 | 3/2<br>3/2 | 75-125<br>75-125 | 0-30<br>0-30 | 0.0031<br>0.0076 | 0.010<br>0.010 |
| Phosphorus, organic (as P) | 365.4 | 3 | NA | NA | NA | 0.10 |
| Phosphorus, total (as P) | 365.4<br>365.3<br>365.2 | 3<br>3<br>3 | 60-140<br>60-140<br>60-140 | 0-40<br>0-40<br>0-40 | 0.098<br>0.025<br>0.0034 | 0.10<br>0.050<br>0.010 |
| Plate count, heterotrophic | 9215 | 4 | NA | NA | NA | 1000 CFU/L |
| Radionuclides, alpha | 900.0/9310/7110 | 54/2/4 | 64-145 | 0-31 | 1.9 pCi/L | 2.0 pCi/L |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (mg/L) | Reporting Limit (mg/L) |
|---|---|---|---|---|---|---|
| Radionuclides, beta | 900.0/9310/7110 | 54/2/4 | 67-140 | 0-28 | 1.4 pCi/L | 2.0 pCi/L |
| Radium 226 | 903.1 | 54 | 48-145 | 0-49 | 0.60 pCi/L | 0.60 pCi/L |
| Radium 228 | 904.0/9320<br>Brooks | 54/2<br>66 | 27-149<br>45-150 | 0-86<br>0-50 | 1.6 pCi/L<br>3.4 pCi/L | 2.0 pCi/L<br>3.4 pCi/L |
| Redox potential | D1498-76 | 38 | NA | NA | NA | NA |
| Residue, dissolved | 160.1/2540C | 3/4 | 75-125 | 0-30 | 4.9 | 5.0 |
| Residue, suspended | 160.2/2540D | 3/4 | 75-125 | 0-30 | 3.6 | 5.0 |
| Residue, total | 160.3/2540B | 3/4 | 60-140 | 0-40 | NA | 5.0 |
| Residue, volatile | 160.4/2540E | 3/4 | NA | 0-40 | NA | 5.0 |
| Salinity | 2520B | 4 | NA | NA | NA | 100 |
| Settleable matter | 160.5/2540F | 3/4 | NA | 0-40 | NA | 0.20 mL |
| Silica, dissolved | 370.1 | 3 | 75-125 | 0-30 | 2.5 | 10 |
| Specific conductance | 120.1/9050 | 3/2 | 90-110 | 0-10 | 0.26 µS/cm | 1.0 µS/cm |
| Specific gravity | 2710F | 3 | NA | NA | NA | NA |
| Streptococcus, fecal, MPN | 9230B | 4 | NA | NA | NA | 2 MPN/100 mL |
| Streptococcus, fecal, MF | 9230C | 4 | NA | NA | NA | 1 col/100 mL |
| Sulfate | 375.2/9036<br>375.3<br>375.4<br>9056/300.0 | 2<br>3<br>3<br>2/3 | 80-120<br>75-125<br>75-125<br>75-125 | 0-30<br>0-30<br>0-30<br>0-30 | 3.2<br>1.2<br>0.61<br>0.42 | 5.0<br>5.0<br>5.0<br>5.0 |
| Sulfide | 376.2<br>9030-SL | 3<br>2 | 60-140<br>50-150 | 0-40<br>0-50 | 0.14<br>0.087 | 0.40<br>0.40 |
| Sulfide, reactive | 7.3.4.2 | 2 | NA | 0-50 | NA | 0.40 |
| Sulfite | 4500-$SO_3^{2-}$<br>377.1 | 4<br>3 | 75-125<br>75-125 | 0-30<br>0-30 | NA<br>NA | 1.0<br>1.0 |
| Surfactants (MBAS) | 425.1 | 3 | 70-130 | 0-30 | 0.049 | 0.10 |
| Temperature | 170.1 | 3 | NA | 0-10 | NA | NA |
| Thiocyanate | 4500-CN M | 4 | 60-140 | 0-40 | 0.021 | 0.10 |
| THM formation potential | 5710B | 4 | NA | NA | NA | 0.010 |
| Turbidity | 180.1/2130 | 3/4 | 60-140 | 0-30 | 0.067 NTU | 0.10 NTU |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Bromobenzene | 502.1 | 51 | 80-120 | NA | 0.34 | 0.50 |
| Bromochloromethane | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| Bromodichloromethane | 502.1 | 51 | 80-120 | NA | 0.44 | 0.50 |
| Bromoform | 502.1 | 51 | 80-120 | NA | 0.91 | 5.0 |
| Bromomethane | 502.1 | 51 | 60-140 | NA | 0.87 | 5.0 |
| Carbon tetrachloride | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| Chlorobenzene | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| Chloroethane | 502.1 | 51 | 60-140 | NA | 0.91 | 1.0 |
| Chloroform | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| Chloromethane | 502.1 | 51 | 60-140 | NA | 0.25 | 1.0 |
| 2-Chlorotoluene | 502.1 | 51 | 60-140 | NA | 0.37 | 0.50 |
| 4-Chlorotoluene | 502.1 | 51 | 60-140 | NA | 0.32 | 0.50 |
| Dibromochloromethane | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| 1,2-Dibromoethane | 502.1 | 51 | 80-120 | NA | 0.50 | 1.0 |
| Dibromomethane | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| 1,2-Dichlorobenzene | 502.1 | 51 | 80-120 | NA | 0.37 | 0.50 |
| 1,3-Dichlorobenzene | 502.1 | 51 | 80-120 | NA | 0.32 | 0.50 |
| 1,4-Dichlorobenzene | 502.1 | 51 | 80-120 | NA | 0.31 | 0.50 |
| Dichlorodifluoromethane | 502.1 | 51 | 60-140 | NA | 0.62 | 1.0 |
| 1,1-Dichloroethane | 502.1 | 51 | 80-120 | NA | 0.50 | 0.50 |
| 1,2-Dichloroethane | 502.1 | 51 | 80-120 | NA | 0.38 | 0.50 |
| 1,1-Dichloroethene | 502.1 | 51 | 80-120 | NA | 0.42 | 0.50 |
| cis-1,2-Dichloroethene | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| trans-1,2-Dichloroethene | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| 1,2-Dichloropropane | 502.1 | 51 | 80-120 | NA | 0.50 | 0.50 |
| 1,3-Dichloropropane | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| 2,2-Dichloropropane | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| 1,1-Dichloropropene | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| cis-1,3-Dichloropropene | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| trans-1,3-Dichloropropene | 502.1 | 51 | 80-120 | NA | 0.43 | 0.50 |
| Methylene chloride | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| 1,1,1,2-Tetrachloroethane | 502.1 | 51 | 80-120 | NA | 0.46 | 0.50 |
| 1,1,2,2-Tetrachloroethane | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Tetrachloroethene | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| 1,1,1-Trichloroethane | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| 1,1,2-Trichloroethane | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| Trichloroethene | 502.1 | 51 | 80-120 | NA | 0.12 | 0.50 |
| Trichlorofluoromethane | 502.1 | 51 | 60-140 | NA | 0.12 | 0.50 |
| 1,2,3-Trichloropropane | 502.1 | 51 | 80-120 | NA | 0.89 | 1.0 |
| Vinyl chloride | 502.1 | 51 | 60-140 | NA | 0.25 | 1.0 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Benzene | 502.2 | 51 | 80-120 | NA | 0.10 | 0.50 |
| Bromobenzene | 502.2 | 51 | 80-120 | NA | 0.15 | 0.50 |
| Bromochloromethane | 502.2 | 51 | 80-120 | NA | 0.16 | 0.50 |
| Bromodichloromethane | 502.2 | 51 | 80-120 | NA | 0.44 | 0.50 |
| Bromoform | 502.2 | 51 | 80-120 | NA | 0.91 | 1.0 |
| Bromomethane | 502.2 | 51 | 60-140 | NA | 0.87 | 1.0 |
| n-Butylbenzene | 502.2 | 51 | 60-140 | NA | 0.26 | 0.50 |
| sec-Butylbenzene | 502.2 | 51 | 60-140 | NA | 0.14 | 0.50 |
| tert-Butylbenzene | 502.2 | 51 | 60-140 | NA | 0.13 | 0.50 |
| Carbon tetrachloride | 502.2 | 51 | 80-120 | NA | 0.12 | 0.50 |
| Chlorobenzene | 502.2 | 51 | 80-120 | NA | 0.070 | 0.50 |
| Chloroethane | 502.2 | 51 | 60-140 | NA | 0.91 | 1.0 |
| Chloroform | 502.2 | 51 | 80-120 | NA | 0.31 | 0.50 |
| Chloromethane | 502.2 | 51 | 60-140 | NA | 0.50 | 1.0 |
| 2-Chlorotoluene | 502.2 | 51 | 60-140 | NA | 0.19 | 0.50 |
| 4-Chlorotoluene | 502.2 | 51 | 60-140 | NA | 0.32 | 0.50 |
| Dibromochloromethane | 502.2 | 51 | 80-120 | NA | 0.21 | 0.50 |
| 1,2-Dibromo-3-chloropropane | 502.2 | 51 | 80-120 | NA | 0.99 | 5.0 |
| 1,2-Dibromoethane | 502.2 | 51 | 80-120 | NA | 0.50 | 1.0 |
| Dibromomethane | 502.2 | 51 | 80-120 | NA | 0.40 | 0.50 |
| 1,2-Dichlorobenzene | 502.2 | 51 | 80-120 | NA | 0.25 | 0.50 |
| 1,3-Dichlorobenzene | 502.2 | 51 | 80-120 | NA | 0.21 | 0.50 |
| 1,4-Dichlorobenzene | 502.2 | 51 | 80-120 | NA | 0.31 | 0.50 |
| Dichlorodifluoromethane | 502.2 | 51 | 60-140 | NA | 0.62 | 1.0 |
| 1,1-Dichloroethane | 502.2 | 51 | 80-120 | NA | 0.50 | 0.50 |
| 1,2-Dichloroethane | 502.2 | 51 | 80-120 | NA | 0.38 | 0.50 |
| 1,1-Dichloroethene | 502.2 | 51 | 80-120 | NA | 0.42 | 0.50 |
| cis-1,2-Dichloroethene | 502.2 | 51 | 80-120 | NA | 0.12 | 0.50 |
| trans-1,2-Dichloroethene | 502.2 | 51 | 80-120 | NA | 0.22 | 0.50 |
| 1,2-Dichloropropane | 502.2 | 51 | 80-120 | NA | 0.50 | 0.50 |
| 1,3-Dichloropropane | 502.2 | 51 | 80-120 | NA | 0.12 | 0.50 |
| 2,2-Dichloropropane | 502.2 | 51 | 80-120 | NA | 0.12 | 0.50 |
| 1,1-Dichloropropene | 502.2 | 51 | 80-120 | NA | 0.12 | 0.50 |
| cis-1,3-Dichloropropene | 502.2 | 51 | 80-120 | NA | 0.18 | 0.50 |
| trans-1,3-Dichloropropene | 502.2 | 51 | 80-120 | NA | 0.43 | 0.50 |
| Ethylbenzene | 502.2 | 51 | 80-120 | NA | 0.070 | 0.50 |
| Hexachlorobutadiene | 502.2 | 51 | 60-140 | NA | 0.25 | 0.50 |
| Isopropylbenzene | 502.2 | 51 | 60-140 | NA | 0.080 | 0.50 |
| 4-Isopropyltoluene | 502.2 | 51 | 60-140 | NA | 0.39 | 0.50 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Methylene chloride | 502.2 | 51 | 80-120 | NA | 0.69 | 1.0 |
| Methyl t-butyl ether (MTBE) | 502.2*** | 51 | 80-120 | NA | 1.9 | 2.0 |
| Naphthalene | 502.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| n-Propylbenzene | 502.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| Styrene | 502.2 | 51 | 80-120 | NA | 0.16 | 0.50 |
| 1,1,1,2-Tetrachloroethane | 502.2 | 51 | 80-120 | NA | 0.46 | 0.50 |
| 1,1,2,2-Tetrachloroethane | 502.2 | 51 | 80-120 | NA | 0.89 | 1.0 |
| Tetrachloroethene | 502.2 | 51 | 80-120 | NA | 0.12 | 0.50 |
| Toluene | 502.2 | 51 | 80-120 | NA | 0.080 | 0.50 |
| 1,2,3-Trichlorobenzene | 502.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| 1,2,4-Trichlorobenzene | 502.2 | 51 | 60-140 | NA | 0.44 | 0.50 |
| 1,1,1-Trichloroethane | 502.2 | 51 | 80-120 | NA | 0.42 | 0.50 |
| 1,1,2-Trichloroethane | 502.2 | 51 | 80-120 | NA | 0.12 | 0.50 |
| Trichloroethene | 502.2 | 51 | 80-120 | NA | 0.28 | 0.50 |
| Trichlorofluoromethane | 502.2 | 51 | 60-140 | NA | 0.43 | 0.50 |
| 1,2,3-Trichloropropane | 502.2 | 51 | 80-120 | NA | 0.89 | 1.0 |
| 1,2,4-Trimethylbenzene | 502.2 | 51 | 60-140 | NA | 0.14 | 0.50 |
| 1,3,5-Trimethylbenzene | 502.2 | 51 | 60-140 | NA | 0.37 | 0.50 |
| Vinyl chloride | 502.2 | 51 | 60-140 | NA | 0.42 | 1.0 |
| o-Xylene | 502.2 | 51 | 80-120 | NA | 0.16 | 0.50 |
| m-Xylene | 502.2 | 51 | 80-120 | NA | 0.15 | 0.50 |
| p-Xylene | 502.2 | 51 | 80-120 | NA | 0.15 | 0.50 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Benzene | 503.1 | 51 | 80-120 | NA | 0.10 | 1.0 |
| Bromobenzene | 503.1 | 51 | 80-120 | NA | 0.15 | 1.0 |
| n-Butylbenzene | 503.1 | 51 | 60-140 | NA | 0.26 | 1.0 |
| sec-Butylbenzene | 503.1 | 51 | 60-140 | NA | 0.14 | 1.0 |
| tert-Butylbenzene | 503.1 | 51 | 60-140 | NA | 0.13 | 1.0 |
| Chlorobenzene | 503.1 | 51 | 80-120 | NA | 0.070 | 1.0 |
| 2-Chlorotoluene | 503.1 | 51 | 80-120 | NA | 0.19 | 1.0 |
| 4-Chlorotoluene | 503.1 | 51 | 80-120 | NA | 0.37 | 1.0 |
| 1,4-Dichlorobenzene | 503.1 | 51 | 80-120 | NA | 0.39 | 1.0 |
| 1,3-Dichlorobenzene | 503.1 | 51 | 80-120 | NA | 0.21 | 1.0 |
| 1,2-Dichlorobenzene | 503.1 | 51 | 80-120 | NA | 0.25 | 1.0 |
| Ethylbenzene | 503.1 | 51 | 80-120 | NA | 0.070 | 1.0 |
| Hexachlorobutadiene | 503.1 | 51 | 60-140 | NA | 0.12 | 1.0 |
| Isopropylbenzene | 503.1 | 51 | 60-140 | NA | 0.080 | 1.0 |
| Naphthalene | 503.1 | 51 | 60-140 | NA | 0.12 | 1.0 |
| n-Propylbenzene | 503.1 | 51 | 60-140 | NA | 0.12 | 1.0 |
| Styrene | 503.1 | 51 | 80-120 | NA | 0.16 | 1.0 |
| Toluene | 503.1 | 51 | 80-120 | NA | 0.080 | 1.0 |
| Trichloroethene | 503.1 | 51 | 80-120 | NA | 0.25 | 1.0 |
| Tetrachloroethene | 503.1 | 51 | 80-120 | NA | 0.25 | 1.0 |
| 1,3,5-Trimethylbenzene | 503.1 | 51 | 60-140 | NA | 0.37 | 1.0 |
| 1,2,4-Trimethylbenzene | 503.1 | 51 | 60-140 | NA | 0.14 | 1.0 |
| 1,2,4-Trichlorobenzene | 503.1 | 51 | 60-140 | NA | 0.44 | 1.0 |
| 1,2,3-Trichlorobenzene | 503.1 | 51 | 60-140 | NA | 0.12 | 1.0 |
| p-Xylene | 503.1 | 51 | 80-120 | NA | 0.15 | 1.0 |
| m-Xylene | 503.1 | 51 | 80-120 | NA | 0.15 | 1.0 |
| o-Xylene | 503.1 | 51 | 80-120 | NA | 0.16 | 1.0 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Chloropicrin | 504***V | 51 | 60-140 | NA | 0.0025 | 0.010 |
| 1,2-Dibromoethane (EDB) | 504/8011 | 51/2 | 60-140 | NA | 0.0061 | 0.020 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 504/8011 | 51/2 | 60-140 | NA | 0.0041 | 0.020 |
| 1,1-Dichloropropane | 504***V | 51 | 60-140 | NA | 0.50 | 2.0 |
| 1,3-Dichloropropene | 504***V | 51 | 60-140 | NA | 0.25 | 1.0 |
| Methyl isothiocyanate | 504***V | 51 | 60-140 | NA | 5.0 | 20 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Alachlor | 505 | 51 | 62-142 | 0-30 | 0.25 | 1.0 |
| Aldrin | 505 | 51 | 56-116 | 0-30 | 0.0025 | 0.010 |
| Atrazine | 505 | 51 | 36-134 | 0-40 | 0.25 | 1.0 |
| gamma BHC (Lindane) | 505 | 51 | 61-121 | 0-18 | 0.0058 | 0.010 |
| alpha Chlordane | 505 | 51 | 35-137 | 0-30 | 0.0033 | 0.010 |
| gamma Chlordane | 505 | 51 | 31-142 | 0-30 | 0.0039 | 0.010 |
| technical Chlordane | 505 | 51 | 68-142 | 0-40 | 0.025 | 0.10 |
| Dieldrin | 505 | 51 | 36-138 | 0-46 | 0.0060 | 0.020 |
| Endrin | 505 | 51 | 30-208 | 0-23 | 0.0073 | 0.020 |
| Heptachlor | 505 | 5 | 46-108 | 0-22 | 0.012 | 0.010 |
| Heptachlor epoxide | 505 | 51 | 53-147 | 0-30 | 0.0035 | 0.020 |
| Hexachlorobenzene | 505 | 51 | 64-145 | 0-40 | 0.012 | 0.050 |
| Hexachlorocyclopentadiene | 505 | 51 | 38-108 | 0-40 | 0.050 | 0.20 |
| Methoxychlor | 505 | 51 | 37-163 | 0-40 | 0.057 | 0.50 |
| cis-Nonachlor | 505 | 51 | 64-156 | 0-30 | 0.012 | 0.050 |
| trans-Nonachlor | 505 | 51 | 21-151 | 0-30 | 0.005 | 0.020 |
| Simazine | 505 | 51 | 69-129 | 0-40 | 0.25 | 1.0 |
| Toxaphene | 505 | 51 | 74-155 | 0-40 | 0.25 | 1.0 |
| PCB 1016 | 505 | 51 | 7-127 | 0-40 | 0.12 | 0.50 |
| PCB 1221 | 505 | 51 | 62-122 | NA | 0.12 | 0.50 |
| PCB 1232 | 505 | 51 | 56-116 | NA | 0.12 | 0.50 |
| PCB 1242 | 505 | 51 | 66-126 | NA | 0.12 | 0.50 |
| PCB 1248 | 505 | 51 | 54-114 | NA | 0.12 | 0.50 |
| PCB 1254 | 505 | 51 | 55-115 | NA | 0.12 | 0.50 |
| PCB 1260 | 505 | 51 | 58-118 | NA | 0.12 | 0.50 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Alachlor | 507 | 51 | 62-128 | NA | 0.25 | 1.0 |
| Ametryn | 507 | 51 | 61-121 | NA | 0.25 | 1.0 |
| Atraton | 507 | 51 | 58-124 | NA | 1.2 | 5.0 |
| Atrazine | 507 | 51 | 62-122 | NA | 0.25 | 1.0 |
| Bromacil | 507 | 51 | 61-121 | NA | 0.50 | 2.0 |
| Butachlor | 507 | 51 | 66-126 | NA | 0.96 | 1.0 |
| Butylate | 507 | 51 | 34-160 | NA | 0.86 | 2.0 |
| Carboxin | 507 | 51 | 72-132 | NA | 0.58 | 1.0 |
| Chlorpropham | 507 | 51 | 60-126 | NA | 0.25 | 1.0 |
| Cycloate | 507 | 51 | 59-119 | NA | 0.83 | 2.0 |
| Diazinon | 507 | 51 | 85-145 | NA | 0.49 | 1.0 |
| Dichlorvos | 507 | 51 | 67-127 | NA | 0.79 | 1.0 |
| Diphenamid | 507 | 51 | 63-123 | NA | 0.96 | 2.0 |
| Disulfoton | 507 | 51 | 59-119 | NA | 1.3 | 2.0 |
| EPTC | 507 | 51 | 55-115 | NA | 0.68 | 2.0 |
| Ethoprop | 507 | 51 | 73-133 | NA | 0.84 | 2.5 |
| Fenamiphos | 507 | 51 | 60-120 | NA | 0.25 | 1.0 |
| Fenarimol | 507 | 51 | 69-129 | NA | 1.0 | 1.0 |
| Fluridone | 507 | 51 | 57-117 | NA | 1.2 | 5.0 |
| Hexazinone | 507 | 51 | 60-120 | NA | 0.25 | 1.0 |
| Merphos | 507 | 51 | 66-126 | NA | 1.0 | 2.5 |
| Metalaxyl | 507*** | 51 | 40-160 | NA | 0.56 | 1.0 |
| Methyl paraoxon | 507*** | 51 | 68-128 | NA | 0.62 | 1.0 |
| Metolachlor | 507 | 51 | 63-123 | NA | 0.25 | 1.0 |
| Metribuzin | 507 | 51 | 71-131 | NA | 0.29 | 1.0 |
| Mevinphos | 507 | 51 | 62-128 | NA | 1.1 | 10 |
| MGK 264 | 507 | 51 | 70-130 | NA | 3.0 | 20 |
| Molinate | 507 | 51 | 44-152 | NA | 0.84 | 2.0 |
| Napropamide | 507 | 51 | 71-131 | NA | 0.81 | 1.0 |
| Norflurazon | 507 | 51 | 64-124 | NA | 0.44 | 1.0 |
| Pebulate | 507 | 51 | 64-124 | NA | 0.79 | 2.0 |
| Prometon | 507 | 51 | 48-108 | NA | 0.25 | 1.0 |
| Prometryn | 507 | 51 | 63-123 | NA | 0.25 | 1.0 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Pronamide | 507 | 51 | 61-121 | NA | 1.2 | 2.0 |
| Propazine | 507 | 51 | 62-122 | NA | 0.25 | 1.0 |
| Simazine | 507 | 51 | 70-130 | NA | 0.74 | 1.0 |
| Simetryn | 507 | 51 | 69-129 | NA | 0.25 | 1.0 |
| Stirophos | 507 | 51 | 68-128 | NA | 0.25 | 1.0 |
| Tebuthiuron | 507 | 51 | 54-114 | NA | 1.8 | 5.0 |
| Terbacil | 507 | 51 | 67-127 | NA | 1.2 | 10 |
| Terbufos | 507 | 51 | 67-127 | NA | 0.16 | 1.0 |
| Terbutryn | 507 | 51 | 64-124 | NA | 0.25 | 1.0 |
| Triademefon | 507 | 51 | 63-123 | NA | 0.25 | 1.0 |
| Vernolate | 507 | 51 | 56-116 | NA | 0.16 | 2.0 |
| Surrogate - Triphenylphosphate | 507 | 51 | 70-130 | NA | NA | NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Aldrin | 508 | 51 | 56-116 | NA | 0.0013 | 0.010 |
| alpha BHC | 508 | 51 | 62-122 | NA | 0.0020 | 0.010 |
| beta BHC | 508 | 51 | 65-125 | NA | 0.0031 | 0.020 |
| delta BHC | 508 | 51 | 68-136 | NA | 0.0028 | 0.010 |
| gamma BHC (Lindane) | 508 | 51 | 59-119 | NA | 0.0031 | 0.010 |
| alpha Chlordane | 508 | 51 | 63-135 | NA | 0.0025 | 0.010 |
| gamma Chlordane | 508 | 51 | 63-135 | NA | 0.0014 | 0.010 |
| Chloroneb | 508 | 51 | 62-132 | NA | 0.012 | 0.50 |
| Chlorobenzilate | 508 | 51 | 78-138 | NA | 0.0051 | 0.20 |
| Chlorothalonil | 508 | 51 | 61-121 | NA | 0.0010 | 0.20 |
| Dacthal (DCPA) | 508 | 51 | 66-140 | NA | 0.0010 | 0.20 |
| 4,4'-DDD | 508 | 51 | 77-137 | NA | 0.0017 | 0.020 |
| 4,4'-DDE | 508 | 51 | 63-135 | NA | 0.0018 | 0.020 |
| 4,4'-DDT | 508 | 51 | 62-162 | NA | 0.0022 | 0.050 |
| Dieldrin | 508 | 51 | 57-117 | NA | 0.0024 | 0.020 |
| Endosulfan I | 508 | 51 | 57-117 | NA | 0.0020 | 0.020 |
| Endosulfan II | 508 | 51 | 62-122 | NA | 0.0016 | 0.050 |
| Endosulfan sulfate | 508 | 51 | 56-148 | NA | 0.0046 | 0.10 |
| Endrin | 508 | 51 | 58-118 | NA | 0.0075 | 0.020 |
| Endrin aldehyde | 508 | 51 | 58-118 | NA | 0.0031 | 0.10 |
| Etridiazole | 508 | 51 | 73-133 | NA | 0.0021 | 0.10 |
| Heptachlor | 508 | 5 | 63-133 | NA | 0.0027 | 0.010 |
| Heptachlor epoxide | 508 | 51 | 57-117 | NA | 0.0029 | 0.020 |
| Hexachlorobenzene | 508 | 51 | 34-164 | NA | 0.0016 | 0.050 |
| Methoxychlor | 508 | 51 | 64-146 | NA | 0.0022 | 0.50 |
| cis-Permethrin | 508 | 51 | 61-121 | NA | 0.0061 | 1.0 |
| trans-Permethrin | 508 | 51 | 81-141 | NA | 0.0038 | 1.0 |
| Propachlor | 508 | 51 | 73-133 | NA | 0.016 | 1.0 |
| Toxaphene | 508 | 51 | 60-150 | NA | 0.080 | 1.0 |
| Trifluralin | 508 | 51 | 73-133 | NA | 0.0018 | 0.050 |
| PCB 1016 | 508 | 51 | 60-150 | NA | 0.080 | 0.50 |
| PCB 1221 | 508 | 51 | 60-150 | NA | 0.077 | 0.50 |
| PCB 1232 | 508 | 51 | 60-150 | NA | 0.052 | 0.50 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| PCB 1242 | 508 | 51 | 60-150 | NA | 0.063 | 0.50 |
| PCB 1248 | 508 | 51 | 60-150 | NA | 0.051 | 0.50 |
| PCB 1254 | 508 | 51 | 60-150 | NA | 0.021 | 0.50 |
| PCB 1260 | 508 | 51 | 60-150 | NA | 0.078 | 0.50 |
| Surrogate - 2,4,5,6-Tetrachloro-m-xylene (TCMX) | 508 | 51 | 70-130 | NA | NA | NA |
| Surrogate - 4,4-Dichlorobiphenyl | 508 | 51 | 70-130 | NA | NA | NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Acifluorfen | 515.1 | 51 | 74-168 | NA | 0.023 | 1.0 |
| Bentazon | 515.1 | 51 | 70-170 | NA | 0.081 | 1.0 |
| Chloramben | 515.1 | 51 | 68-154 | NA | 0.047 | 1.0 |
| 2,4-D | 515.1 | 51 | 49-214 | NA | 0.062 | 0.50 |
| Dalapon | 515.1 | 51 | 48-126 | NA | 0.061 | 10 |
| 2,4-DB | 515.1 | 51 | 48-126 | NA | 0.34 | 0.50 |
| Dicamba | 515.1 | 51 | 38-232 | NA | 0.028 | 0.50 |
| 3,5-Dichlorobenzoic acid | 515.1 | 51 | 53-151 | NA | 0.027 | 1.0 |
| Dichlorprop | 515.1 | 51 | 46-168 | NA | 0.070 | 0.50 |
| Dinoseb | 515.1 | 51 | DL-85 | NA | 0.048 | 0.50 |
| 5-Hydroxydicamba | 515.1 | 51 | 54-153 | NA | 0.25 | 1.0 |
| 4-Nitrophenol | 515.1 | 51 | 60-202 | NA | 0.066 | 1.0 |
| Pentachlorophenol | 515.1 | 51 | 37-224 | NA | 0.018 | 1.0 |
| Picloram | 515.1 | 51 | 45-138 | NA | 0.015 | 0.50 |
| 2,4,5-T | 515.1 | 51 | 68-166 | NA | 0.027 | 0.50 |
| 2,4,5-TP (Silvex) | 515.1 | 51 | 42-226 | NA | 0.029 | 0.50 |
| Surrogate - 2,4-Dichlorophenylacetic Acid (DCAA) | 515.1 | 51 | 70-130 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Acifluorfen | 515.2 | 51 | 60-140 | NA | 0.25 | 1.0 |
| Bentazon | 515.2 | 51 | 60-140 | NA | 0.25 | 1.0 |
| 2,4-D | 515.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| 2,4-DB | 515.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| Dacthal | 515.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| Dicamba | 515.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| 3,5-Dichlorobenzoic acid | 515.2 | 51 | 60-140 | NA | 0.25 | 1.0 |
| Dichlorprop | 515.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| Dinoseb | 515.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| 5-Hydroxydicamba | 515.2 | 51 | 60-140 | NA | 0.25 | 1.0 |
| Pentachlorophenol | 515.2 | 51 | 60-140 | NA | 0.25 | 1.0 |
| Picloram | 515.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| 2,4,5-T | 515.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| 2,4,5-TP (Silvex) | 515.2 | 51 | 60-140 | NA | 0.12 | 0.50 |
| Surrogate - 2,4-Dichlorophenylacetic Acid (DCAA) | 515.2 | 51 | 60-140 | NA | NA | NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Benzene | 524.2 | 51 | 80-120 | NA | 0.11 | 1.0 |
| Bromobenzene | 524.2 | 51 | 80-120 | NA | 0.14 | 1.0 |
| Bromochloromethane | 524.2 | 51 | 80-120 | NA | 0.63 | 1.0 |
| Bromodichloromethane | 524.2 | 51 | 80-120 | NA | 0.17 | 1.0 |
| Bromoform | 524.2 | 51 | 80-120 | NA | 0.18 | 1.0 |
| Bromomethane | 524.2 | 51 | 60-140 | NA | 0.47 | 2.0 |
| n-Butylbenzene | 524.2 | 51 | 60-140 | NA | 0.39 | 1.0 |
| sec-Butylbenzene | 524.2 | 51 | 60-140 | NA | 0.24 | 1.0 |
| tert-Butylbenzene | 524.2 | 51 | 60-140 | NA | 0.19 | 1.0 |
| Carbon tetrachloride | 524.2 | 51 | 80-120 | NA | 0.16 | 1.0 |
| Chlorobenzene | 524.2 | 51 | 80-120 | NA | 0.18 | 1.0 |
| Chloroethane | 524.2 | 51 | 60-140 | NA | 0.62 | 2.0 |
| Chloroform | 524.2 | 51 | 80-120 | NA | 0.14 | 1.0 |
| Chloromethane | 524.2 | 51 | 60-140 | NA | 0.63 | 2.0 |
| 2-Chlorotoluene | 524.2 | 51 | 60-140 | NA | 0.22 | 1.0 |
| 4-Chlorotoluene | 524.2 | 51 | 60-140 | NA | 0.26 | 1.0 |
| Dibromochloromethane | 524.2 | 51 | 80-120 | NA | 0.25 | 1.0 |
| 1,2-Dibromo-3-chloropropane | 524.2 | 51 | 80-120 | NA | 0.81 | 2.0 |
| 1,2-Dibromoethane | 524.2 | 51 | 80-120 | NA | 0.21 | 1.0 |
| Dibromomethane | 524.2 | 51 | 80-120 | NA | 0.23 | 1.0 |
| 1,2-Dichlorobenzene | 524.2 | 51 | 80-120 | NA | 0.30 | 1.0 |
| 1,3-Dichlorobenzene | 524.2 | 51 | 80-120 | NA | 0.23 | 1.0 |
| 1,4-Dichlorobenzene | 524.2 | 51 | 80-120 | NA | 0.26 | 1.0 |
| Dichlorodifluoromethane | 524.2 | 51 | 60-140 | NA | 0.69 | 1.0 |
| 1,1-Dichloroethane | 524.2 | 51 | 80-120 | NA | 0.68 | 1.0 |
| 1,2-Dichloroethane | 524.2 | 51 | 80-120 | NA | 0.28 | 1.0 |
| 1,1-Dichloroethene | 524.2 | 51 | 80-120 | NA | 0.21 | 1.0 |
| cis-1,2-Dichloroethene | 524.2 | 51 | 80-120 | NA | 0.26 | 1.0 |
| trans-1,2-Dichloroethene | 524.2 | 51 | 80-120 | NA | 0.40 | 1.0 |
| 1,2-Dichloropropane | 524.2 | 51 | 80-120 | NA | 0.19 | 1.0 |
| 1,3-Dichloropropane | 524.2 | 51 | 80-120 | NA | 0.35 | 1.0 |
| 2,2-Dichloropropane | 524.2 | 51 | 80-120 | NA | 0.77 | 1.0 |
| 1,1-Dichloropropene | 524.2 | 51 | 80-120 | NA | 0.17 | 1.0 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| cis-1,3-Dichloropropene | 524.2 | 51 | 80-120 | NA | 0.37 | 1.0 |
| trans-1,3-Dichloropropene | 524.2 | 51 | 80-120 | NA | 0.35 | 1.0 |
| Ethylbenzene | 524.2 | 51 | 80-120 | NA | 0.17 | 1.0 |
| Hexachlorobutadiene | 524.2 | 51 | 60-140 | NA | 0.53 | 1.0 |
| Isopropylbenzene | 524.2 | 51 | 60-140 | NA | 0.26 | 1.0 |
| 4-Isopropyltoluene | 524.2 | 51 | 60-140 | NA | 0.30 | 1.0 |
| Methylene chloride | 524.2 | 51 | 80-120 | NA | 0.30 | 1.0 |
| Methyl t-butyl ether (MTBE) | 524.2*** | 51 | 80-120 | NA | 0.22 | 2.0 |
| Naphthalene | 524.2 | 51 | 60-140 | NA | 1.0 | 1.0 |
| n-Propylbenzene | 524.2 | 51 | 60-140 | NA | 0.20 | 1.0 |
| Styrene | 524.2 | 51 | 80-120 | NA | 0.16 | 1.0 |
| 1,1,1,2-Tetrachloroethane | 524.2 | 51 | 80-120 | NA | 0.22 | 1.0 |
| 1,1,2,2-Tetrachloroethane | 524.2 | 51 | 80-120 | NA | 0.26 | 1.0 |
| Tetrachloroethene | 524.2 | 51 | 80-120 | NA | 0.95 | 1.0 |
| Toluene | 524.2 | 51 | 80-120 | NA | 0.55 | 1.0 |
| 1,2,3-Trichlorobenzene | 524.2 | 51 | 60-140 | NA | 0.92 | 1.0 |
| 1,2,4-Trichlorobenzene | 524.2 | 51 | 60-140 | NA | 0.86 | 1.0 |
| 1,1,1-Trichloroethane | 524.2 | 51 | 80-120 | NA | 0.25 | 1.0 |
| 1,1,2-Trichloroethane | 524.2 | 51 | 80-120 | NA | 0.50 | 1.0 |
| Trichloroethene | 524.2 | 51 | 80-120 | NA | 0.24 | 1.0 |
| Trichlorofluoromethane | 524.2 | 51 | 60-140 | NA | 0.56 | 1.0 |
| 1,2,3-Trichloropropane | 524.2 | 51 | 80-120 | NA | 0.47 | 1.0 |
| 1,2,4-Trimethylbenzene | 524.2 | 51 | 60-140 | NA | 0.25 | 1.0 |
| 1,3,5-Trimethylbenzene | 524.2 | 51 | 60-140 | NA | 0.24 | 1.0 |
| Vinyl chloride | 524.2 | 51 | 60-140 | NA | 0.52 | 1.0 |
| o-Xylene | 524.2 | 51 | 80-120 | NA | 0.20 | 1.0 |
| m-Xylene | 524.2 | 51 | 80-120 | NA | 0.25 | 1.0 |
| p-Xylene | 524.2 | 51 | 80-120 | NA | 0.25 | 1.0 |
| Surrogate - p-Bromofluorobenzene | 524.2 | 51 | 79-125 | NA | NA | NA |
| Surrogate - 1,2-Dichlorobenzene-d4 | 524.2 | 51 | 77-135 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Acenaphthylene | 525.1 | 51 | 70-130 | NA | 0.15 | 0.50 |
| Alachlor | 525.1 | 51 | 70-130 | NA | 0.59 | 1.0 |
| Aldrin | 525.1 | 51 | 35-130 | NA | 0.21 | 1.0 |
| Anthracene | 525.1 | 51 | 70-130 | NA | 0.36 | 0.50 |
| Atrazine | 525.1 | 51 | 70-130 | NA | 0.35 | 2.0 |
| Benz(a)anthracene | 525.1 | 51 | 70-130 | NA | 0.23 | 0.50 |
| Benzo(b)fluoranthene | 525.1 | 51 | 35-130 | NA | 0.24 | 0.50 |
| Benzo(k)fluoranthene | 525.1 | 51 | 35-130 | NA | 0.23 | 0.50 |
| Benzo(a)pyrene | 525.1 | 51 | 35-130 | NA | 0.19 | 0.20 |
| Benzo(g,h,i)perylene | 525.1 | 51 | 35-130 | NA | 0.28 | 0.50 |
| Butyl benzyl phthalate | 525.1 | 51 | 70-130 | NA | 0.25 | 1.0 |
| alpha Chlordane | 525.1 | 51 | 35-130 | NA | 0.19 | 1.0 |
| gamma Chlordane | 525.1 | 51 | 35-130 | NA | 0.19 | 1.0 |
| Chrysene | 525.1 | 51 | 70-130 | NA | 0.10 | 0.50 |
| Dibenz(a,h)anthracene | 525.1 | 51 | 35-130 | NA | 0.23 | 0.50 |
| Di-n-butyl phthalate | 525.1 | 51 | 70-130 | NA | 0.22 | 10 |
| Diethylphthalate | 525.1 | 51 | 70-130 | NA | 0.31 | 2.0 |
| bis(2-ethylhexyl)adipate | 525.1 | 51 | 35-130 | NA | 0.37 | 1.0 |
| bis(2-ethylhexyl)phthalate | 525.1 | 51 | 35-130 | NA | 0.17 | 2.0 |
| Dimethylphthalate | 525.1 | 51 | 70-130 | NA | 0.40 | 1.0 |
| Endrin | 525.1 | 51 | 35-130 | NA | 0.20 | 5.0 |
| Fluorene | 525.1 | 51 | 70-130 | NA | 0.060 | 0.50 |
| Heptachlor | 525.1 | 51 | 35-130 | NA | 0.20 | 1.0 |
| Heptachlor epoxide | 525.1 | 51 | 35-130 | NA | 0.21 | 1.0 |
| Hexachlorobenzene | 525.1 | 51 | 35-130 | NA | 0.31 | 0.50 |
| Hexachlorocyclopentadiene | 525.1 | 51 | 35-130 | NA | 0.84 | 0.50 |
| Indeno(1,2,3-cd)pyrene | 525.1 | 51 | 35-130 | NA | 0.25 | 0.50 |
| Lindane | 525.1 | 51 | 35-130 | NA | 0.25 | 1.0 |
| Methoxychlor | 525.1 | 51 | 35-130 | NA | 0.52 | 1.0 |
| trans-Nonachlor | 525.1 | 51 | 35-130 | NA | 0.26 | 1.0 |
| Pentachlorophenol | 525.1 | 51 | 35-130 | NA | 0.75 | 3.0 |
| Phenanthrene | 525.1 | 51 | 70-130 | NA | 0.25 | 0.50 |
| Pyrene | 525.1 | 51 | 70-130 | NA | 0.17 | 0.50 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Simazine | 525.1 | 51 | 70-130 | NA | 0.46 | 2.0 |
| Toxaphene | 525.1 | 51 | 35-130 | NA | 12 | 50 |
| **PCBs:** | | | | | | |
| 2-Chlorobiphenyl | 525.1 | 51 | 70-130 | NA | 0.15 | 5.0 |
| 2,3-Dichlorobiphenyl | 525.1 | 51 | 70-130 | NA | 0.20 | 5.0 |
| 2,4,5-Trichlorobiphenyl | 525.1 | 51 | 35-130 | NA | 0.43 | 5.0 |
| 2,2',4,4'-Tetrachlorobiphenyl (MS) | 525.1 | 51 | 35-130 | NA | 0.23 | 5.0 |
| 2,2',3',4,6-Pentachlorobiphenyl | 525.1 | 51 | 35-130 | NA | 0.21 | 5.0 |
| 2,2',4,4',5,6'-Hexachlorobiphenyl | 525.1 | 51 | 35-130 | NA | 0.21 | 5.0 |
| 2,2',3,3',4,4',6-Heptachlorobiphenyl | 525.1 | 51 | 35-130 | NA | 0.27 | 5.0 |
| 2,2',3,3',4,5',6,6'-Octachlorobiphenyl | 525.1 | 51 | 35-130 | NA | 0.31 | 5.0 |
| Surrogate - Perylene-d12 | 525.1 | 51 | 35-130 | NA | NA | NA |
| Surrogate - Pyrene-d10 | 525.1 | 51 | 70-130 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Aldicarb (MS) | 531.1 | 33/51 | 85-145 | NA | 0.12 | 0.50 |
| Aldicarb sulfone | 531.1 | 33/51 | 71-131 | NA | 0.17 | 0.50 |
| Aldicarb sulfoxide | 531.1 | 33/51 | 67-127 | NA | 0.21 | 0.50 |
| Carbaryl | 531.1 | 33/51 | 67-127 | NA | 0.51 | 1.0 |
| Carbofuran (MS) | 531.1 | 33/51 | 72-132 | NA | 0.47 | 1.0 |
| 3-Hydroxycarbofuran | 531.1 | 33/51 | 72-132 | NA | 0.50 | 1.0 |
| Methiocarb | 531.1 | 51 | 64-124 | NA | 1.7 | 5.0 |
| Methomyl | 531.1 | 33/51 | 75-135 | NA | 0.58 | 1.0 |
| Oxamyl (MS) | 531.1 | 33/51 | 70-130 | NA | 0.37 | 1.0 |
| Propoxur (Baygon) | 531.1 | 33/51 | 76-136 | NA | 0.26 | 1.0 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Glyphosate | 547 | 51 | 66-126 | NA | 11 | 50 |
| Endothal | 548.1 | 51 | 66-106 | NA | 4.1 | 25 |
| Diquat | 549.1 | 51/56 | 56-116 | NA | 0.39 | 1.0 |
| Paraquat | 549.1 | 51/56 | 58-118 | NA | 0.25 | 1.0 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Benzyl chloride | 8010(5030) | 2 | 50-150 | 0-30 | 0.25 | 5.0 |
| Bromobenzene | 8010(5030) | 2 | 70-130 | 0-30 | 2.5 | 10 |
| Bromodichloromethane | 601/8010(5030) | 1/2 | 66-128 | 0-19 | 0.14 | 1.0 |
| Bromoform | 601/8010(5030) | 1/2 | 50-128 | 0-17 | 0.52 | 5.0 |
| Bromomethane | 601/8010(5030) | 1/2 | 55-137 | 0-48 | 0.31 | 1.0 |
| Carbon tetrachloride | 601/8010(5030) | 1/2 | 74-128 | 0-22 | 0.15 | 1.0 |
| Chlorobenzene (MS) | 601/8010(5030) | 1/2 | 64-123 | 0-18 | 0.36 | 1.0 |
| Chloroethane | 601/8010(5030) | 1/2 | 55-132 | 0-37 | 0.26 | 1.0 |
| Chloroform | 601/8010(5030) | 1/2 | 68-134 | 0-22 | 0.20 | 1.0 |
| 1-Chlorohexane | 8010(5030) | 2 | 50-150 | 0-30 | 0.040 | 1.0 |
| 2-Chloroethylvinyl ether | 601/8010(5030) | 1/2 | 52-132 | 0-20 | 0.18 | 10 |
| Chloromethane | 601/8010(5030) | 1/2 | 39-149 | 0-57 | 0.25 | 1.0 |
| 2-Chlorotoluene | 8010(5030) | 2 | 70-130 | 0-30 | 0.20 | 10 |
| 4-Chlorotoluene | 8010(5030) | 2 | 70-130 | 0-30 | 0.20 | 10 |
| Dibromochloromethane | 601/8010(5030) | 1/2 | 69-124 | 0-20 | 0.20 | 1.0 |
| Dibromomethane | 8010(5030) | 2 | 70-130 | 0-30 | 0.33 | 1.0 |
| 1,2-Dichlorobenzene | 601/8010(5030) | 1/2 | 69-127 | 0-25 | 0.35 | 1.0 |
| 1,3-Dichlorobenzene | 601/8010(5030) | 1/2 | 64-125 | 0-19 | 0.19 | 1.0 |
| 1,4-Dichlorobenzene | 601/8010(5030) | 1/2 | 59-142 | 0-25 | 0.27 | 1.0 |
| Dichlorodifluoromethane | 601/8010(5030) | 1/2 | 70-130 | 0-30 | 0.41 | 1.0 |
| 1,1-Dichloroethane | 601/8010(5030) | 1/2 | 65-130 | 0-21 | 0.19 | 1.0 |
| 1,2-Dichloroethane | 601/8010(5030) | 1/2 | 64-127 | 0-22 | 0.25 | 1.0 |
| 1,1-Dichloroethene (MS) | 601/8010(5030) | 1/2 | 49-144 | 0-20 | 0.10 | 1.0 |
| cis-1,2-Dichloroethene | 601/8010(5030) | 1/2 | 66-126 | 0-21 | 0.31 | 1.0 |
| trans-1,2-Dichloroethene | 601/8010(5030) | 1/2 | 66-126 | 0-21 | 0.31 | 1.0 |
| Dichloromethane (methylene chloride) | 601/8010(5030) | 1/2 | 57-141 | 0-33 | 0.24 | 1.0 |
| 1,2-Dichloropropane | 601/8010(5030) | 1/2 | 69-121 | 0-16 | 0.11 | 1.0 |
| cis/trans-1,3-Dichloropropylene | 601/8010(5030) | 1/2 | 63-135 | 0-17 | 0.16 | 1.0 |
| 1,1,2,2-Tetrachloroethane | 601/8010(5030) | 1/2 | 61-148 | 0-20 | 0.12 | 1.0 |
| 1,1,1,2-Tetrachloroethane | 8010(5030) | 2 | 70-130 | 0-30 | 0.15 | 1.0 |
| Tetrachloroethylene | 601/8010(5030) | 1/2 | 61-151 | 0-21 | 0.12 | 1.0 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 601/8010(5030) | 1/2 | 63-132 | 0-18 | 0.14 | 1.0 |
| 1,1,2-Trichloroethane | 601/8010(5030) | 1/2 | 66-131 | 0-17 | 0.20 | 1.0 |
| Trichloroethene (MS) | 601/8010(5030) | 1/2 | 61-144 | 0-21 | 0.70 | 1.0 |
| Trichlorofluoromethane | 601/8010(5030) | 1/2 | 61-126 | 0-33 | 0.30 | 1.0 |
| 1,2,3-Trichloropropane | 8010(5030) | 2 | 50-150 | 0-30 | 0.47 | 1.0 |
| Vinyl chloride | 601/8010(5030) | 1/2 | 49-153 | 0-38 | 0.37 | 1.0 |
| 1,2-Dibromoethane (EDB) | 8010***(5030) | 2 | 75-125 | 0-30 | 0.20 | 1.0 |
| Surrogate - Bromochloromethane | 601/8010(5030) | 1/2 | 50-136 | NA | NA | NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Acetone | 8015***(5030) | 2 | 40-130 | 0-30 | 6.8 | 25 |
| 2-Butanone (MEK) | 8015(5030) | 2 | 60-130 | 0-40 | 8.8 | 25 |
| Diethyl ether (MS) | 8015(5030) | 2 | 10-130 | 0-50 | 2.0 | 25 |
| Ethanol | 8015(5030) | 2 | 20-140 | 0-45 | 3.9 | 25 |
| Ethyl methacrylate | 8015***(5030) | 2 | 42-125 | 0-40 | 2.5 | 10 |
| 2-Hexanone | 8015***(5030) | 2 | 50-150 | 0-50 | 1.6 | 25 |
| Isobutanol | 8015***(5030) | 2 | 50-125 | 0-40 | 100 | 1000 |
| Isopropanol | 8015***(5030) | 2 | 30-140 | 0-40 | 140 | 1000 |
| Methacrylonitrile | 8015***(5030) | 2 | 10-140 | 0-60 | 25 | 100 |
| Methanol | 8015***(5030) | 2 | 50-150 | 0-40 | 110 | 1000 |
| Methyl methacrylate | 8015***(5030) | 2 | 42-132 | 0-42 | 2.5 | 10 |
| 4-Methyl-2-pentanone (MIBK) (MS) | 8015(5030) | 2 | 65-125 | 0-40 | 4.0 | 10 |
| Methyl t-butyl ether (MTBE) | 8015***(5030) | 2 | 50-150 | 0-30 | 3.6 | 25 |
| Propionitrile | 8015***(5030) | 2 | 10-130 | 0-50 | 25 | 100 |
| Gasoline | GRO<br>8015 (modified) | 70<br>12 | 50-150<br>40-140 | 0-20<br>0-40 | 7.8<br>27 | 36<br>50 |
| Mineral spirits | 8015 (modified) | 12 | 40-140 | 0-40 | 12 | 50 |
| Surrogate - α,α,α,-Trifluorotoluene | 8015 | 2 | 77-140 | NA | NA | NA |
| Acetone | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 510 | 1000 |
| tert-Amyl alcohol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 130 | 1000 |
| sec-Butanol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 190 | 1000 |
| n-Butanol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 220 | 1000 |
| tert-Butanol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 160 | 1000 |
| n-Butyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 2200 | 5000 |
| sec-Butyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1800 | 5000 |
| Butyl cellosolve | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 580 | 5000 |
| Cellosolve acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 270 | 5000 |
| Cyclohexanone | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 200 | 5000 |
| Diacetone alcohol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1400 | 5000 |
| 1,4-Dioxane | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 300 | 1000 |
| Ethanol (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 210 | 1000 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Ethyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1200 | 5000 |
| Methanol (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 110 | 1000 |
| n-Propanol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 390 | 1000 |
| Isopropanol (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 140 | 1000 |
| Diethylene glycol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1200 | 5000 |
| Ethylene glycol (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 890 | 5000 |
| 2-Hexanone | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 2100 | 5000 |
| Isoamyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 4000 | 5000 |
| Isobutanol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 100 | 1000 |
| Isobutyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 2400 | 5000 |
| Isopropyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1600 | 5000 |
| 2-Butanone (MEK) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 960 | 5000 |
| Mesityl oxide | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 650 | 5000 |
| Methyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1100 | 5000 |
| 4-Methyl-2-pentanone (MIBK) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1700 | 5000 |
| 2-Nitropropane | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 440 | 5000 |
| n-Propyl acetate (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1200 | 5000 |
| Propylene glycol (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 600 | 5000 |
| Tetraethylene glycol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1200 | 5000 |
| Tetrahydrofuran (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 790 | 5000 |
| Triethylene glycol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 2200 | 5000 |
| Vinyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 4400 | 5000 |

* DAI = Direct Aqueous Injection

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Benzene (MS) | 602/8020(5030) | 1/2 | 68-134 | 0-19 | 0.11 | 1.0 |
| Chlorobenzene (MS) | 602/8020(5030) | 1/2 | 70-133 | 0-17 | 0.090 | 1.0 |
| 1,2-Dichlorobenzene | 602/8020(5030) | 1/2 | 69-125 | 0-13 | 0.16 | 1.0 |
| 1,3-Dichlorobenzene | 602/8020(5030) | 1/2 | 67-131 | 0-12 | 0.10 | 1.0 |
| 1,4-Dichlorobenzene | 602/8020(5030) | 1/2 | 75-127 | 0-14 | 0.080 | 1.0 |
| Ethylbenzene | 602/8020(5030) | 1/2 | 78-124 | 0-13 | 0.070 | 1.0 |
| Methyl t-butyl ether | 602/8020***(5030) | 1/2 | 50-150 | 0-30 | 3.6 | 10 |
| Toluene (MS) | 602/8020(5030) | 1/2 | 69-131 | 0-19 | 0.080 | 1.0 |
| Xylenes | 602***/8020(5030) | 2 | 50-150 | 0-30 | 0.28 | 1.0 |
| Surrogate - a,a,a-Trifluorotoluene | 602/8020(5030) | 1/2 | 77-140 | NA | NA | NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Benzene (MS) | 8021 | 2 | 61-131 | 0-31 | 0.19 | 1.0 |
| Bromobenzene | 8021 | 2 | 46-195 | 0-56 | 0.50 | 10 |
| Bromochloromethane | 8021 | 2 | 34-128 | 0-52 | 0.27 | 1.0 |
| Bromodichloromethane | 8021 | 2 | 46-143 | 0-54 | 0.14 | 1.0 |
| Bromoform | 8021 | 2 | 31-131 | 0-40 | 0.13 | 5.0 |
| Bromomethane | 8021 | 2 | 25-167 | 0-78 | 0.39 | 1.0 |
| n-Butylbenzene | 8021 | 2 | 50-150 | 0-22 | 0.17 | 1.0 |
| sec-Butylbenzene | 8021 | 2 | 50-150 | 0-21 | 0.14 | 1.0 |
| tert-Butylbenzene | 8021 | 2 | 49-188 | 0-48 | 0.18 | 1.0 |
| Carbon tetrachloride | 8021 | 2 | 42-141 | 0-50 | 0.18 | 1.0 |
| Chlorobenzene (MS) | 8021 | 2 | 48-143 | 0-24 | 0.060 | 1.0 |
| Chloroethane | 8021 | 2 | 43-158 | 0-52 | 0.40 | 1.0 |
| Chloroform | 8021 | 2 | 53-134 | 0-36 | 0.24 | 1.0 |
| Chloromethane | 8021 | 2 | 40-172 | 0-53 | 0.26 | 1.0 |
| 2-Chlorotoluene | 8021 | 2 | 70-140 | 0-27 | 0.30 | 10 |
| 4-Chlorotoluene | 8021 | 2 | 77-136 | 0-27 | 0.28 | 10 |
| Dibromochloromethane | 8021 | 2 | 44-150 | 0-56 | 0.13 | 1.0 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 8021 | 2 | 24-145 | 0-56 | 1.4 | 1.0 |
| 1,2-Dibromoethane (EDB) | 8021 | 2 | 34-168 | 0-77 | 0.52 | 1.0 |
| Dibromomethane | 8021 | 2 | 41-147 | 0-59 | 0.53 | 1.0 |
| 1,2-Dichlorobenzene | 8021 | 2 | 52-141 | 0-39 | 0.24 | 1.0 |
| 1,3-Dichlorobenzene | 8021 | 2 | 68-123 | 0-28 | 0.19 | 1.0 |
| 1,4-Dichlorobenzene | 8021 | 2 | 65-131 | 0-42 | 0.090 | 1.0 |
| Dichlorodifluoromethane | 8021 | 2 | 49-196 | 0-50 | 0.41 | 1.0 |
| 1,1-Dichloroethane | 8021 | 2 | 61-137 | 0-36 | 0.19 | 1.0 |
| 1,2-Dichloroethane | 8021 | 2 | 38-148 | 0-58 | 0.18 | 1.0 |
| 1,1-Dichloroethene (MS) | 8021 | 2 | 48-155 | 0-35 | 0.31 | 1.0 |
| cis-1,2-Dichloroethene | 8021 | 2 | 40-138 | 0-39 | 0.10 | 1.0 |
| trans-1,2-Dichloroethene | 8021 | 2 | 64-139 | 0-43 | 0.18 | 1.0 |
| 1,2-Dichloropropane | 8021 | 2 | 53-129 | 0-45 | 0.18 | 1.0 |
| 1,3-Dichloropropane | 8021 | 2 | 53-150 | 0-57 | 1.1 | 1.0 |
| 2,2-Dichloropropane | 8021 | 2 | 40-138 | 0-39 | 0.48 | 1.0 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| 1,1-Dichloropropene | 8021 | 2 | 42-141 | 0-50 | 0.62 | 1.0 |
| cis-1,3-Dichloropropene | 8021 | 2 | 44-146 | 0-45 | 0.23 | 1.0 |
| trans-1,3-Dichloropropene | 8021 | 2 | 30-152 | 0-55 | 0.080 | 1.0 |
| Ethylbenzene | 8021 | 2 | 68-118 | 0-29 | 0.21 | 1.0 |
| Hexachlorobutadiene | 8021 | 2 | 52-145 | 0-41 | 0.35 | 1.0 |
| Isopropylbenzene | 8021 | 2 | 50-150 | 0-27 | 0.16 | 1.0 |
| p-Isopropyltoluene | 8021 | 2 | 50-150 | 0-24 | 0.21 | 1.0 |
| Methylene chloride | 8021 | 2 | 60-177 | 0-40 | 0.40 | 1.0 |
| Naphthalene | 8021 | 2 | 67-133 | 0-42 | 0.69 | 1.0 |
| n-Propylbenzene | 8021 | 2 | 50-150 | 0-19 | 0.15 | 1.0 |
| Styrene | 8021 | 2 | 81-108 | 0-18 | 0.39 | 1.0 |
| 1,1,1,2-Tetrachloroethane | 8021 | 2 | 62-141 | 0-41 | 0.54 | 1.0 |
| 1,1,2,2-Tetrachloroethane | 8021 | 2 | 61-148 | 0-48 | 0.28 | 1.0 |
| Tetrachloroethene | 8021 | 2 | 53-150 | 0-57 | 0.25 | 1.0 |
| Toluene (MS) | 8021 | 2 | 64-144 | 0-22 | 0.070 | 1.0 |
| 1,2,3-Trichlorobenzene | 8021 | 2 | 77-125 | 0-26 | 0.26 | 1.0 |
| 1,2,4-Trichlorobenzene | 8021 | 2 | 44-139 | 0-53 | 0.30 | 1.0 |
| 1,1,1-Trichloroethane | 8021 | 2 | 59-136 | 0-47 | 0.37 | 1.0 |
| 1,1,2-Trichloroethane | 8021 | 2 | 64-160 | 0-53 | 0.12 | 1.0 |
| Trichloroethene (MS) | 8021 | 2 | 51-140 | 0-48 | 0.14 | 1.0 |
| Trichlorofluoromethane | 8021 | 2 | 58-152 | 0-37 | 0.30 | 1.0 |
| 1,2,3-Trichloropropane | 8021 | 2 | 61-148 | 0-48 | 3.3 | 1.0 |
| 1,2,4-Trimethylbenzene | 8021 | 2 | 32-132 | 0-44 | 0.20 | 1.0 |
| 1,3,5-Trimethylbenzene | 8021 | 2 | 50-150 | 0-16 | 0.33 | 1.0 |
| Vinyl Chloride | 8021 | 2 | 44-173 | 0-61 | 0.26 | 1.0 |
| o-Xylene | 8021 | 2 | 50-150 | 0-18 | 0.36 | 1.0 |
| m&p-Xylene | 8021 | 2 | 62-138 | 0-49 | 0.29 | 1.0 |
| Surrogate - 2-Bromo-1-chloropropane | 8021 | 2 | 70-130 | NA | NA | NA |
| Surrogate - Fluorobenzene | 8021 | 2 | 70-130 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Acrolein | 603/8030(5030) | 1/2 | 88-118 | 0-30 | 8.3 | 20 |
| Acrylonitrile | 603/8030(5030) | 1/2 | 71-135 | 0-30 | 6.3 | 20 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| 2-Chlorophenol (MS) | 604/8040(3520) | 1/2 | 64-102 | 0-31 | 1.1 | 10 |
| 4-Chloro-3-methylphenol (MS) | 604/8040(3520) | 1/2 | 56-116 | 0-29 | 1.2 | 10 |
| 2,4-Dichlorophenol | 604/8040(3520) | 1/2 | 55-111 | 0-26 | 1.7 | 10 |
| 2,4-Dimethylphenol | 604/8040(3520) | 1/2 | 53-113 | 0-39 | 2.9 | 10 |
| 2,4-Dinitrophenol | 604/8040(3520) | 1/2 | 29-127 | 0-25 | 12 | 50 |
| 2-Methyl-4,6-dinitrophenol | 604/8040(3520) | 1/2 | 58-114 | 0-34 | 2.3 | 50 |
| 3 and 4 Methyl phenol (m & p cresol) | ***8040(3520) | 2 | 10-150 | 0-50 | 3.3 | 10 |
| 2-Methyl phenol (o-cresol) | ***8040(3520) | 2 | 10-150 | 0-50 | 1.8 | 10 |
| Cresols (total) | 8040(3520) | 2 | NA | NA | 2.5 | 10 |
| 2-Nitrophenol | 604/8040(3520) | 1/2 | 57-109 | 0-29 | 1.1 | 10 |
| 4-Nitrophenol (MS) | 604/8040(3520) | 1/2 | 33-129 | 0-54 | 1.7 | 50 |
| Pentachlorophenol (MS) | 604/8040(3520) | 1/2 | 65-122 | 0-27 | 2.9 | 50 |
| Phenol (MS) | 604/8040(3520) | 1/2 | 51-110 | 0-35 | 1.0 | 10 |
| Trichlorophenols (2,4,5 and 2,4,6) | 8040(3520) | 2 | NA | NA | 5.0 | 10 |
| 2,3,4,5-Tetrachlorophenol | ***8040(3520) | 2 | 50-150 | 0-40 | 2.9 | 20 |
| 2,3,4,6-Tetrachlorophenol | ***8040(3520) | 2 | 50-150 | 0-40 | 5.0 | 20 |
| Tetrachlorophenols (2,3,4,5 and 2,3,4,6) | 8040(3520) | 2 | NA | NA | 5.0 | 20 |
| 2,4,5-Trichlorophenol | ***8040(3520) | 2 | 53-119 | 0-40 | 4.4 | 10 |
| 2,4,6-Trichlorophenol | 604/8040(3520) | 1/2 | 69-105 | 0-16 | 1.8 | 10 |
| Surrogate - 2,4,6-Tribromophenol | 604/8040(3520) | 1/2 | 32-160 | NA | NA | NA |
| Dichlorophen | 604.1 | 18 | 22-125 | 0-30 | 2.5 | 10 |
| Hexachlorophene | 604.1 | 18 | 73-125 | 0-30 | 2.5 | 10 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Bis(2-ethylhexyl) phthalate (MS) | 606/8060(3520) | 1/2 | 10-162 | 0-82 | 1.2 | 10 |
| Butyl benzyl phthalate (MS) | 606/8060(3520) | 1/2 | 10-137 | 0-73 | 1.3 | 10 |
| Diethyl phthalate (MS) | 606/8060(3520) | 1/2 | 10-142 | 0-47 | 1.5 | 10 |
| Dimethyl phthalate (MS) | 606/8060(3520) | 1/2 | 10-158 | 0-63 | 1.5 | 10 |
| Di-n-butyl phthalate (MS) | 606/8060(3520) | 1/2 | 18-137 | 0-46 | 1.1 | 10 |
| Di-n-octyl phthalate (MS) | 606/8060(3520) | 1/2 | 12-145 | 0-52 | 1.3 | 10 |
| Surrogate - 2-Fluorobiphenyl | 606/8060(3520) | 1/2 | 27-123 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Aldrin<br>(MS - Except CLP 10/92) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 32-135<br>40-120<br>NA | 0-37<br>0-22<br>NA | 0.012<br>0.050<br>0.010 | 0.050<br>0.050<br>0.010 |
| Benfluralin | 608/8080(3520)*** | 1/2 | 40-140 | 0-40 | 0.0025 | 0.010 |
| alpha BHC | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 37-182<br>NA<br>NA | 0-9<br>NA<br>NA | 0.0022<br>0.050<br>0.010 | 0.050<br>0.050<br>0.010 |
| beta BHC | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 64-165<br>NA<br>NA | 0-17<br>NA<br>NA | 0.0053<br>0.050<br>0.010 | 0.050<br>0.050<br>0.010 |
| delta BHC | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | DL-181<br>NA<br>NA | 0-21<br>NA<br>NA | 0.0055<br>0.050<br>0.010 | 0.050<br>0.050<br>0.010 |
| gamma BHC (Lindane)<br>(MS - All methods) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 29-155<br>56-123<br>56-123 | 0-25<br>0-15<br>NA | 0.0027<br>0.050<br>0.010 | 0.050<br>0.050<br>0.010 |
| alpha Chlordane | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 14-183<br>NA<br>NA | 0-22<br>NA<br>NA | 0.0043<br>0.050<br>0.010 | 0.050<br>0.050<br>0.010 |
| gamma Chlordane<br>(MS - CLP 10/92) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 89-117<br>NA<br>33-130 | 0-26<br>NA<br>NA | 0.0061<br>0.050<br>0.010 | 0.050<br>0.050<br>0.010 |
| technical Chlordane | 608/8080(3520) | 1/2/26 | 63-136 | 0-73 | 0.064 | 0.50 |
| Chlorobenzilate | 8081***V(3520) | 2 | 50-150 | 0-40 | 0.092 | 0.50 |
| Chlorothalonil | 608/8080***(3520) | 1/2 | 55-125 | 0-30 | 0.050 | 0.20 |
| 4,4'-DDD | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 85-150<br>NA<br>NA | 0-7<br>NA<br>NA | 0.016<br>0.10<br>0.020 | 0.10<br>0.10<br>0.020 |
| 4,4'-DDE<br>(MS - CLP 10/92) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 50-182<br>NA<br>50-150 | 0-17<br>NA<br>NA | 0.0078<br>0.10<br>0.020 | 0.10<br>0.10<br>0.020 |
| 4,4'-DDT<br>(MS - Except CLP 10/92) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 40-148<br>38-127<br>NA | 0-22<br>0.27<br>NA | 0.021<br>0.10<br>0.020 | 0.10<br>0.10<br>0.020 |
| Dicofol (Kelthane) | 8081***V(3520) | 1/2 | 55-115 | 0-40 | 0.012 | 0.050 |
| Dieldrin<br>(MS - All methods) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 54-138<br>52-126<br>33-130 | 0-18<br>0.18<br>NA | 0.0051<br>0.10<br>0.020 | 0.10<br>0.10<br>0.020 |
| Endosulfan I | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 79-140<br>NA<br>NA | 0-24<br>NA<br>NA | 0.0039<br>0.050<br>0.010 | 0.050<br>0.050<br>0.010 |
| Endosulfan II | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 83-160<br>NS<br>NA | 0-19<br>NA<br>NA | 0.0098<br>0.10<br>0.020 | 0.10<br>0.10<br>0.020 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Endosulfan sulfate (MS - CLP 10/92) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 10-205<br>NA<br>50-120 | 0-42<br>NA<br>NA | 0.041<br>0.10<br>0.020 | 0.10<br>0.10<br>0.020 |
| Endrin (MS - All methods) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 17-167<br>56-121<br>56-121 | 0-87<br>0-21<br>NA | 0.0069<br>0.10<br>0.020 | 0.10<br>0.10<br>0.020 |
| Endrin aldehyde | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 59-175<br>NA<br>NA | 0-81<br>NA<br>NA | 0.016<br>0.10<br>0.020 | 0.10<br>0.10<br>0.020 |
| Endrin ketone | CLP 3/90<br>CLP 10/92 | 62<br>6 | NA<br>NA | NA<br>NA | 0.10<br>0.020 | 0.10<br>0.020 |
| Heptachlor (MS - Except CLP 10/92) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 34-133<br>40-131<br>NA | 0-24<br>0-20<br>NA | 0.0094<br>0.050<br>0.010 | 0.050<br>0.050<br>0.010 |
| Heptachlor epoxide (MS - CLP 10/92) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | DL-218<br>NA<br>74-150 | 0-212<br>NA<br>NA | 0.0041<br>0.050<br>0.010 | 0.050<br>0.050<br>0.010 |
| Isodrin | 8081(3520) | 2 | 55-110 | 0-40 | 0.0099 | 0.050 |
| Kepone | 8081(3520) | 2 | 10-150 | 0-50 | 0.038 | 0.10 |
| Methoxychlor | 8080(3520)<br>CLP 3/90<br>CLP 10/92 | 2/26<br>62<br>6 | 50-140<br>NA<br>NA | 0-40<br>NA<br>NA | 0.051<br>0.50<br>0.10 | 0.50<br>0.50<br>0.10 |
| Mirex | 8081(3530) | 2 | 52-112 | 0-37 | 0.12 | 0.50 |
| Toxaphene | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 73-166<br>NA<br>NA | 0-28<br>NA<br>NA | 0.69<br>5.0<br>1.0 | 5.0<br>5.0<br>1.0 |
| Trifluralin | 608/8081(3520) | 1/2 | 54-124 | 0-40 | 0.0025 | 0.010 |
| PCB 1016 | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 57-131<br>NA<br>NA | 0-38<br>NA<br>NA | 0.13<br>1.0<br>0.20 | 1.0<br>1.0<br>0.20 |
| PCB 1221 | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 15-178<br>NA<br>NA | 0-20<br>NA<br>NA | 0.29<br>2.0<br>0.40 | 2.0<br>2.0<br>0.40 |
| PCB 1232 | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 10-215<br>NA<br>NA | 0-20<br>NA<br>NA | 0.18<br>1.0<br>0.20 | 1.0<br>1.0<br>0.20 |
| PCB 1242 | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 39-150<br>NA<br>NA | 0-20<br>NA<br>NA | 0.068<br>1.0<br>0.20 | 1.0<br>1.0<br>0.20 |
| PCB 1248 | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 38-158<br>NA<br>NA | 0-20<br>NA<br>NA | 0.13<br>1.0<br>0.20 | 1.0<br>1.0<br>0.20 |
| PCB 1254 | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 66-122<br>NA<br>NA | 0-23<br>NA<br>NA | 0.14<br>1.0<br>0.20 | 1.0<br>1.0<br>0.20 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| PCB 1260 | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 80-133<br>NA<br>NA | 0-26<br>NA<br>NA | 0.26<br>1.0<br>0.20 | 1.0<br>1.0<br>0.20 |
| Surrogate - Dibutylchlorendate (DBC) | 608/8080(3520) | 1/2/26 | 28-151 | NA | NA | NA |
| Surrogate - 2,4,5,6-Tetrachloro-m-xylene (TCMX) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 22-126<br>60-150<br>30-150 | NA<br>NA<br>NA | NA<br>NA<br>NA | NA<br>NA<br>NA |
| Surrogate - Decachlorobiphenyl (DCB) | 608/8080(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2/26<br>62<br>6 | 25-126<br>60-150<br>30-150 | NA<br>NA<br>NA | NA<br>NA<br>NA | NA<br>NA<br>NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Chloroneb | 608.1 | 10 | 49-125 | 0-30 | 0.10 | 0.40 |
| Chloropropylate | 608.1 | 10 | 51-125 | 0-30 | 0.12 | 0.50 |
| Chlorobenzilate (MS) | 608.1 | 10 | 53-125 | 0-30 | 0.12 | 0.50 |
| Etridiazole | 608.1 | 10 | 60-125 | 0-30 | 0.0025 | 0.010 |
| PCNB | 608.1 | 10 | 60-125 | 0-30 | 0.15 | 0.60 |
| Propachlor | 608.1 | 10 | 51-125 | 0-30 | 0.12 | 0.50 |
| Chlorothalonil | 608.2 | 57 | 55-125 | 0-30 | 0.050 | 0.20 |
| DCPA (Dacthal) | 608.2 | 57 | 50-150 | 0-40 | 0.12 | 0.50 |
| Dichloran | 608.2 | 57 | 56-110 | 0-40 | 1.2 | 5.0 |
| Methoxychlor | 608.2 | 57 | 50-140 | 0-40 | 0.12 | 0.50 |
| Permethrin | 608.2 | 57 | 50-130 | 0-40 | 0.25 | 1.0 |
| Surrogate - Dibutylchlorendate (DBC) | 608.1/608.2 | 10/57 | 28-151 | NA | NA | NA |
| Surrogate - 2,4,5,6-Tetrachloro-m-xylene (TCMX) | 608.1/608.2 | 10/57 | 22-126 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| 2,4-Dinitrotoluene (MS) | 609/8090(3520)(FID)<br>609/8090(3520) (ECD) | 1,2 | 10-125<br>10-125 | 0-40<br>0-40 | 2.5<br>0.075 | 10<br>0.30 |
| 2,6-Dinitrotoluene (MS) | 609/8090(3520) (FID)<br>609/8090(3520) (ECD) | 1,2 | 10-126<br>10-126 | 0-40<br>0-40 | 2.5<br>0.075 | 10<br>0.30 |
| Isophorone (MS) | 609/8090(3520) | 1,2 | 10-117 | 0-40 | 2.5 | 10 |
| Nitrobenzene (MS) | 609/8090(3520) | 1,2 | 10-118 | 0-40 | 2.5 | 10 |
| Surrogate - 2-Fluorobiphenyl | 609/8090(3520) (FID) | 1,2 | 27-123 | NA | NA | NA |
| Surrogate - 2,4,5,6-Tetrachloro-m-xylene (TCMX) | 609/8090(3520) (ECD) | 1,2 | 22-126 | NA | NA | NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Acenaphthene (MS) | 610/8100(3520) | 1/2 | 35-130 | 0-21 | 2.6 | 10 |
| Acenaphthylene | 610/8100(3520) | 1/2 | 57-124 | 0-30 | 2.4 | 10 |
| Benzo(a)pyrene (MS) | 610/8100(3520) | 1/2 | 14-165 | 0-40 | 3.0 | 10 |
| Benzo(b+k)fluoranthene | 610/8100(3520) | 1/2 | 59-168 | 0-51 | 2.5 | 10 |
| Benzo(g,h,i)perylene | 610/8100(3520) | 1/2 | 51-198 | 0-61 | 2.3 | 10 |
| Carbazole | 8100***(3520) | 2 | 16-140 | 0-40 | 2.5 | 10 |
| Chrysene + Benzo(a)anthracene | 610/8100(3520) | 1/2 | 62-155 | 0-38 | 2.5 | 10 |
| Fluoranthene | 610/8100(3520) | 1/2 | 70-134 | 0-23 | 3.0 | 10 |
| Fluorene (MS) | 610/8100(3520) | 1/2 | 32-136 | 0-19 | 3.0 | 10 |
| Indeno(1,2,3-cd) pyrene + Dibenzo(a,h)anthracene | 610/8100(3520) | 1/2 | 52-178 | 0-52 | 2.5 | 10 |
| 1-Methyl naphthalene | 610/8100(3520) | 1/2 | 20-140 | 0-50 | 2.7 | 10 |
| 2-Methyl naphthalene | 610/8100(3520) | 1/2 | 20-140 | 0-50 | 3.0 | 10 |
| Naphthalene (MS) | 610/8100(3520) | 1/2 | 40-116 | 0-28 | 3.4 | 10 |
| Phenanthrene + Anthracene | 610/8100(3520) | 1/2 | 67-133 | 0-28 | 2.5 | 10 |
| Pyrene (MS) | 610/8100(3520) | 1/2 | 41-137 | 0-28 | 5.2 | 10 |
| Diesel | DRO<br>8100 (modified) | 69<br>12 | 40-140<br>30-149 | 0-40<br>0-40 | 75<br>75 | 100<br>300 |
| Surrogate - 2-Fluorobiphenyl | 610/8100(3520) | 1/2 | 27-123 | NA | NA | NA |
| Surrogate - o-Terphenyl | DRO<br>610/8100(3520) | 69<br>1/2 | 50-150<br>40-145 | NA<br>NA | NA<br>NA | NA<br>NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Acephate | 614***/8141***(3520) | 52/2 | 25-140 | 0-50 | 1.2 | 5.0 |
| Azinphos methyl | 614/622/8141(3520) | 14/2 | 16-129 | 0-50 | 0.25 | 1.0 |
| Bolstar | 622/8141(3520) | 14/2 | 58-156 | 0-40 | 0.25 | 1.0 |
| Carbophenothion | 8141***(3520) | 2 | 20-150 | 0-40 | 0.25 | 1.0 |
| Chlorpyrifos | 614/622/8141(3520) | 52/14/2 | 61-102 | 0-40 | 0.25 | 1.0 |
| Chlorpyrifos methyl | 622 | 14 | 20-130 | 0-40 | 0.25 | 1.0 |
| Coumaphos | 622/8141(3520) | 14/2 | 51-147 | 0-40 | 0.25 | 1.0 |
| Demeton-o | 614/622/8141(3520) | 52/14/2 | 36-120 | 0-40 | 0.62 | 2.5 |
| Demeton-s | 614/622/8141(3520) | 52/14/2 | 36-120 | 0-40 | 0.62 | 2.5 |
| Diazinon (MS) | 614/622/8141(3520) | 52/14/2 | 36-124 | 0-40 | 0.25 | 1.0 |
| Dichlofenthion | 614/8141***V(3520) | 52/2 | 62-104 | 0-40 | 0.25 | 1.0 |
| Dichlorvos | 622/8141(3520) | 14/2 | 49-120 | 0-40 | 0.50 | 2.0 |
| Dimethoate | 8141(3520) | 2 | 38-120 | 0-40 | 0.32 | 10 |
| Dioxathion | 614/614.1/8141***V/ (3520) | 52/2 | 25-140 | 0-40 | 2.5 | 10 |
| Disulfoton | 614/622/8141(3520) | 52/14/2 | 10-178 | 0-66 | 0.060 | 2.0 |
| EPN | 614.1/8141(3520) | 58/2 | 48-124 | 0-40 | 0.25 | 1.0 |
| Ethion | 614/614.1/8141(3520) | 52/58/2 | 40-138 | 0-40 | 0.12 | 0.50 |
| Ethoprop | 622/8141(3520) | 52/14/2 | 58-113 | 0-40 | 0.12 | 0.50 |
| Famphur | 8141***V(3520) | 2 | 10-129 | 0-60 | 0.072 | 2.0 |
| Fenamiphos | 614*** | 52 | 40-160 | 0-40 | 0.12 | 0.50 |
| Fensulfothion | 622/8141(3520) | 14/2 | 43-145 | 0-40 | 1.2 | 5.0 |
| Fenthion | 622/8141(3520) | 14/2 | 10-128 | 0-60 | 0.25 | 1.0 |
| Isofenphos | 614*** | 52 | 40-160 | 0-40 | 0.12 | 0.50 |
| Malathion | 614/8141(3520) | 52 | 60-140 | 0-40 | 0.25 | 1.0 |
| Merphos | 622/8141(3520) | 14/2 | 50-130 | 0-40 | 0.25 | 1.0 |
| Methamidophos | 614*** | 52 | 40-160 | 0-40 | 0.50 | 2.0 |
| Metolachlor | 614/8141***(3520) | 52/2 | 53-133 | 0-40 | 0.25 | 1.0 |
| Mevinphos | 622/8141(3520) | 52/14/2 | 34-125 | 0-40 | 0.50 | 2.0 |
| Monocrotophos | 8141(3520) | 52/2 | 25-140 | 0-50 | 2.5 | 10 |
| Naled | 622/8141(3520) | 14/2 | 54-102 | 0-40 | 1.2 | 5.0 |
| Parathion, ethyl (MS) | 614/8141(3520) | 52/2 | 18-171 | 0-28 | 0.083 | 1.0 |
| Parathion, methyl (MS) | 614/622/8141(3520) | 52/14/2 | 40-140 | 0-40 | 0.072 | 0.50 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Phorate | 622/8141(3520) | 14/2 | 36-125 | 0-40 | 0.074 | 1.0 |
| Ronnel (MS) | 622/8141(3520) | 14/2 | 45-135 | 0-35 | 0.075 | 1.0 |
| Stirophos (Tetrachlorvinphos) | 622/8141(3520) | 14/2 | 48-125 | 0-40 | 0.25 | 1.0 |
| Sulfotepp | 8141(3520) | 2 | 10-241 | 0-40 | 0.074 | 0.50 |
| Terbufos | 614.1 | 58 | 40-160 | 0-40 | 0.12 | 0.50 |
| Thionazin (MS) | 8141***V(3520) | 2 | 25-160 | 0-60 | 0.056 | 1.0 |
| Tokuthion (Prothiofos) | 622/8141(3520) | 14/2 | 44-125 | 0-40 | 0.25 | 1.0 |
| Trichloronate | 622/8141(3520) | 14/2 | 49-161 | 0-40 | 0.25 | 1.0 |
| Surrogate - Triphenylphosphate | 614/622/8141 | 14/20/2 | 40-125 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| 2,4-D (MS) | 615/8150 | 53/2 | DL-262 | 0-77 | 0.12 | 0.50 |
| 2,4-DB | 615/8150 | 53/2 | DL-230 | 0-121 | 0.12 | 0.50 |
| 2,4,5-T (MS) | 615/8150 | 53/2 | DL-218 | 0-90 | 0.031 | 0.50 |
| 2,4,5-TP (Silvex) (MS) | 615/8150 | 53/2 | DL-201 | 0-94 | 0.030 | 0.50 |
| Dalapon | 615/8150 | 53/2 | 10-160 | 0-80 | 1.4 | 120 |
| Dicamba | 615/8150 | 53/2 | DL-317 | 0-86 | 0.059 | 1.2 |
| Dichlorprop | 615/8150 | 53/2 | DL-258 | 0-103 | 0.33 | 6.0 |
| Dinoseb | 615/8150 | 53/2 | DL-143 | 0-157 | 0.13 | 6.0 |
| MCPA | 615/8150 | 53/2 | DL-231 | 0-91 | 2.5 | 120 |
| MCPP | 615/8150 | 53/2 | DL-210 | 0-91 | 2.5 | 120 |
| Pentachlorophenol | 615/8150*** | 53/2 | 10-150 | 0-80 | 0.25 | 1.0 |
| Picloram | 615/8150***V | 53/2 | 10-150 | 0-40 | 0.025 | 0.50 |
| Surrogate - 2,4-Dichlorophenylacetic acid (DCAA) | 615/8150 | 53/2 | 10-135 | NA | NA | NA |
| Surrogate - 2,4-Dichlorophenoxy butyric acid (2,4-DB) | 615/8150 | 53/2 | 40-140 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Captan (MS) | 617 | 26 | 55-125 | 0-40 | 0.025 | 0.10 |
| Carbophenothion | 617 | 26 | 50-110 | 0-40 | 0.25 | 1.0 |
| Dichloran | 617 | 26 | 56-110 | 0-40 | 1.2 | 5.0 |
| Dicofol | 617 | 26 | 55-115 | 0-40 | 0.025 | 0.10 |
| Isodrin (MS) | 617 | 26 | 55-110 | 0-40 | 0.012 | 0.050 |
| Mirex | 617 | 26 | 54-104 | 0-40 | 0.12 | 0.50 |
| PCNB | 617 | 26 | 54-100 | 0-40 | 0.0025 | 0.010 |
| Perthane | 617 | 26 | 55-115 | 0-40 | 1.2 | 5.0 |
| Strobane | 617 | 26 | 48-127 | 0-40 | 0.50 | 2.0 |
| Trifluralin | 617 | 26 | 54-124 | 0-40 | 0.0025 | 0.010 |
| Chloropicrin | 618 | 27 | 62-134 | 0-40 | 0.25 | 1.0 |
| Ethylene dibromide | 618 | 27 | 48-90 | 0-40 | 0.12 | 0.50 |
| Surrogate - 2,4,5,6-Tetrachloro-m-xylene (TCMX) | 617/618 | 26/27 | 22-126 | NA | NA | NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Alachlor | 619*** | 7 | 45-140 | 0-30 | 0.50 | 2.0 |
| Ametryn | 619 | 7 | 60-120 | 0-40 | 0.50 | 2.0 |
| Atraton | 619 | 7 | 50-115 | 0-40 | 1.2 | 5.0 |
| Atrazine (MS) | 619 | 7 | 40-125 | 0-30 | 1.3 | 2.0 |
| Bromacil | 619*** | 7 | 55-127 | 0-30 | 0.50 | 2.0 |
| Hexazinone | 619*** | 7 | 50-130 | 0-30 | 0.50 | 2.0 |
| Metalaxyl | 619*** | 7 | 50-130 | 0-40 | 0.25 | 1.0 |
| Metribuzin | 619*** | 7 | 61-141 | 0-30 | 0.50 | 2.0 |
| Norflurazon | 619*** | 7 | 54-134 | 0-30 | 0.50 | 2.0 |
| Prometon | 619 | 7 | 55-100 | 0-40 | 1.5 | 2.0 |
| Prometryn | 619 | 7 | 55-120 | 0-40 | 1.1 | 2.0 |
| Propazine (MS) | 619 | 7 | 33-100 | 0-40 | 1.3 | 2.0 |
| Secbumeton | 619 | 7 | 30-130 | 0-45 | 1.2 | 5.0 |
| Simetryn | 619 | 7 | 50-200 | 0-40 | 0.50 | 2.0 |
| Simazine | 619 | 7 | 25-174 | 0-50 | 0.50 | 2.0 |
| Terbuthylazine | 619 | 7 | 60-130 | 0-40 | 1.1 | 2.0 |
| Terbutryn | 619 | 7 | 53-113 | 0-40 | 0.50 | 2.0 |
| Triadimefon | 619*** | 7 | 61-125 | 0-30 | 0.50 | 2.0 |
| Diphenylamine | 620 | 23 | 56-125 | 0-30 | 0.50 | 2.0 |
| Surrogate - Triphenylphosphate | 619/620 | 7/23 | 40-125 | NA | NA | NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Aspon | 622.1 | 8 | 62-104 | 0-40 | 0.25 | 1.0 |
| Dichlofenthion | 622.1 | 8 | 62-104 | 0-40 | 0.25 | 1.0 |
| Famphur | 622.1 | 8 | 10-129 | 0-40 | 0.62 | 2.5 |
| Fenitrothion | 622.1 | 8 | 61-103 | 0-40 | 0.50 | 2.0 |
| Fonophos | 622.1 | 8 | 53-133 | 0-40 | 0.25 | 1.0 |
| Phosmet | 622.1 | 8 | 50-150 | 0-40 | 0.25 | 1.0 |
| Thionazin | 622.1 | 8 | 25-160 | 0-40 | 0.25 | 1.0 |
| Surrogate - Triphenylphosphate | 622.1 | 8 | 40-125 | NA | NA | NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REF | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Acetone | 8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 10-161<br>NA<br>NA | 0-40<br>NA<br>NA | 4.4<br>10<br>5.0 | 25<br>10<br>5.0 |
| Acetonitrile | 8240(5030) | 2 | 52-170 | 0-40 | 280 | 1000 |
| Acrolein | 8240(5030)/8260(5030) | 2 | 60-132 | 0-40 | 34 | 100 |
| Acrylonitrile | 8240(5030)/8260(5030) | 2 | 77-108 | 0-40 | 15 | 100 |
| Benzene (MS)<br>(MS - All Methods) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 69-132<br>76-127<br>60-140 | 0-35<br>0-11<br>NA | 1.1<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Benzyl Chloride | 8240(5030)8260(5030) | 2 | 10-130 | 0-70 | 25 | 100 |
| Bromobenzene | 8260(5030) | 2 | 50-150 | 0-40 | 16 | 10 |
| Bromochloromethane | 8260 (5030)<br>CLP 10/92 | 2<br>6 | 50-150<br>NA | 0-40<br>NA | 1.2<br>1.0 | 5.0<br>1.0 |
| Bromodichloromethane | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 91-120<br>NA<br>NA | 0-16<br>NA<br>NA | 0.37<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Bromoform<br>(MS - CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 72-137<br>NA<br>60-140 | 0-17<br>NA<br>NA | 0.98<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Bromomethane | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 45-151<br>NA<br>NA | 0-32<br>NA<br>NA | 2.2<br>10<br>1.0 | 10<br>10<br>1.0 |
| 2-Butanone (MEK) | 8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 79-208<br>NA<br>NA | 0-40<br>NA<br>NA | 3.2<br>10<br>5.0 | 25<br>10<br>5.0 |
| n-Butylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.5 | 5.0 |
| sec-Butylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.4 | 5.0 |
| tert-Butylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.0 | 5.0 |
| Carbon disulfide | 8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 37-138<br>NA<br>NA | 0-40<br>NA<br>NA | 1.1<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Carbon tetrachloride<br>(MS - CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 67-129<br>NA<br>60-140 | 0-21<br>NA<br>NA | 0.54<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Chlorobenzene<br>(MS - except CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 52-150<br>75-130<br>NA | 0-16<br>0-13<br>NA | 0.55<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| 2-Chloro-1,3-butadiene<br>(Chloroprene) | 8240(5030) 8260(5030) | 2 | 21-163 | 0-50 | 0.83 | 5.0 |
| Chloroethane | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 32-179<br>NA<br>NA | 0-36<br>NA<br>NA | 2.6<br>10<br>1.0 | 10<br>10<br>1.0 |
| 2-Chloroethyl vinyl ether | 624/8240(5030)/8260(5030) | 1/2 | 12-237 | 0-96 | 1.7 | 50 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REF | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Chloroform | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 58-140<br>NA<br>NA | 0-62<br>NA<br>NA | 0.62<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Chloromethane | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 10-273<br>NA<br>NA | 0-65<br>NA<br>NA | 1.4<br>10<br>1.0 | 10<br>10<br>1.0 |
| 3-Chloropropene (Allyl chloride) | 8240(5030) 8260 (5030) | 2 | 81-112 | 0-40 | 1.5 | 5.0 |
| 2-Chlorotoluene | 8240***(5030)/8260(5030) | 1/2 | 58-125 | 0-40 | 0.87 | 5.0 |
| 4-Chlorotoluene | 8260(5030) | 2 | 50-150 | 0-40 | 0.87 | 5.0 |
| Dibromochloromethane | 524/8240/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 65-138<br>NA<br>NA | 0-15<br>NA<br>NA | 0.53<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 8240(5030)/8260(5030)<br>CLP 10/92 | 2<br>6 | 37-127<br>NA | 0-40<br>NA | 4.2<br>1.0 | 10<br>1.0 |
| 1,2-Dibromoethane (MS - CLP 10/92) | 8240(5030)/8260(5030)<br>CLP 10/92 | 2<br>6 | 70-112<br>60-140 | 0-40<br>NA | 0.48<br>1.0 | 5.0<br>1.0 |
| Dibromomethane | 8240(5030)/8260(5030) | 2 | 78-110 | 0-40 | 0.36 | 5.0 |
| 1,2-Dichlorobenzene | 624/8240(5030)/8260(5030)<br>CLP 10/92 | 1/2<br>6 | 75-131<br>60-140 | 0-21<br>NA | 0.60<br>NA | 5.0<br>1.0 |
| 1,3-Dichlorobenzene | 624/8240(5030)/8260(5030)<br>CLP 10/92 | 1/2<br>6 | 77-119<br>60-140 | 0-23<br>NA | 0.63<br>NA | 5.0<br>1.0 |
| 1,4-Dichlorobenzene (MS - CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 10/92 | 1/2<br>6 | 72-130<br>60-140 | 0-28<br>NA | 0.83<br>1.0 | 5.0<br>1.0 |
| trans-1,4-Dichloro-2-butene | 8240(5030) | 2 | 11-129 | 0-40 | 5.7 | 10 |
| Dichlorodifluoromethane | 8240(5030)/8260(5030) | 2 | 72-146 | 0-40 | 0.88 | 5.0 |
| 1,1-Dichloroethane | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 64-132<br>NA<br>NA | 0-40<br>NA<br>NA | 0.56<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| 1,2-Dichloroethane (MS - CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 21-172<br>NA<br>60-140 | 0-26<br>NA<br>NA | 0.56<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| cis/trans-1,2-Dichloroethene | 624/8240(5030)/8260(5030)<br>CLP 3/90 | 1/2<br>62 | 54-156<br>NA | 0-40<br>NA | 1.2<br>10 | 5.0<br>10 |
| cis-1,2-Dichloroethene | 624/8240(5030)/8260<br>CLP 10/92 | 1/2<br>6 | 54-456<br>NA | 0-40<br>NA | 1.2<br>1.0 | 5.0<br>1.0 |
| trans-1,2-Dichloroethene | 624/8240(5030)/8260<br>CLP 10/92 | 1/2<br>6 | 54-156<br>NA | 0-40<br>NA | 1.2<br>1.0 | 5.0<br>1.0 |
| 1,1-Dichloroethene (MS)<br>(MS - except CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 26-155<br>61-145<br>NA | 0-16<br>0-14<br>NA | 1.7<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| 1,2-Dichloropropane (MS - CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 75-130<br>NA<br>60-140 | 0-15<br>NA<br>NA | 0.30<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| 1,3-Dichloropropane | 8260(5030) | 2 | 50-150 | 0-40 | 0.72 | 5.0 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REF | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| 2,2-Dichloropropane | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| 1,1-Dichloropropene | 8260(5030) | 2 | 50-150 | 0-40 | 0.90 | 5.0 |
| cis-1,3-Dichloropropene (MS - CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 71-126<br>NA<br>60-140 | 0-19<br>NA<br>NA | 0.59<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| trans-1,3-Dichloropropene | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 64-134<br>NA<br>NA | 0-18<br>NA<br>NA | 0.59<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Diethyl ether | 8240***(5030) | 2 | 50-150 | 0-40 | 2.5 | 10 |
| Ethanol | 8240(5030) | 2 | 40-160 | 0-40 | 250 | 1000 |
| Ethylbenzene | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>5 | 80-117<br>NA<br>NA | 0-23<br>NA<br>NA | 0.65<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Ethyl methacrylate | 8240(5030) | 2 | 37-139 | 0-40 | 1.6 | 5.0 |
| Hexachlorobutadiene | 8260(5030) | 2 | 50-150 | 0-40 | 0.83 | 5.0 |
| 2-Hexanone | 8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 10-164<br>NA<br>NA | 0-40<br>NA<br>NA | 3.6<br>10<br>5.0 | 25<br>10<br>5.0 |
| Iodomethane | 8240(5030)/8260(5030) | 2 | 37-137 | 0-40 | 1.5 | 5.0 |
| Isobutyl alcohol | 8240(5030) | 2 | 51-179 | 0-40 | 310 | 1000 |
| Isopropylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| p-Isopropyltoluene | 8260(5030) | 2 | 50-150 | 0-40 | 3.7 | 5.0 |
| Methacrylonitrile | 8240(5030) | 2 | 76-111 | 0-40 | 1.3 | 100 |
| Methylene chloride | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 63-136<br>NA<br>NA | 0-37<br>NA<br>NA | 1.5<br>10<br>2.0 | 5.0<br>10<br>2.0 |
| Methylmethacrylate | 8240(5030) | 2 | 50-130 | 0-40 | 1.9 | 5.0 |
| 4-Methyl-2-pentanone (MIBK) | 8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 68-111<br>NA<br>NA | 0-40<br>NA<br>NA | 1.0<br>10<br>5.0 | 25<br>10<br>5.0 |
| Methyl t-butyl ether (MTBE) | 8240***(5030) | 2 | 50-150 | 0-40 | 2.5 | 10 |
| Naphthalene | 8260(5030) | 2 | 50-150 | 0-40 | 2.0 | 5.0 |
| Pentachloroethane | 8240(5030) | 2 | 10-276 | 0-65 | 11 | 25 |
| Propionitrile (ethylcyanide) | 8240(5030) | 2 | 63-112 | 0-40 | 23 | 100 |
| n-Propylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.0 | 5.0 |
| Styrene | 8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 60-109<br>NA<br>NA | 0-40<br>NA<br>NA | 1.1<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| 1,1,1,2-Tetrachloroethane | 8240B(5030)/8260(5030) | 2 | 34-138 | 0-40 | 1.1 | 5.0 |
| 1,1,2,2-Tetrachloroethane | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 66-157<br>NA<br>NA | 0-25<br>NA<br>NA | 1.3<br>10<br>1.0 | 5.0<br>10<br>1.0 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REF | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Tetrachloroethene<br>(MS - CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 70-124<br>NA<br>60-140 | 0-19<br>NA<br>NA | 0.79<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Toluene<br>(MS - except CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 62-141<br>76-125<br>NA | 0-24<br>0-13<br>NA | 0.99<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| 1,2,3-Trichlorobenzene | 8260(5030) | 2 | 50-150 | 0-40 | 0.69 | 5.0 |
| 1,2,4-Trichlorobenzene | 8260(5030) | 2 | 50-150 | 0-40 | 0.88 | 5.0 |
| 1,1,1-Trichloroethane | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 72-134<br>NA<br>NA | 0-11<br>NA<br>NA | 0.75<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| 1,1,2-Trichloroethane<br>(MS - CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 61-151<br>NA<br>60-140 | 0-16<br>NA<br>NA | 0.39<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Trichloroethene<br>(MS - All methods) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 64-131<br>71-120<br>60-140 | 0-24<br>0-14<br>NA | 1.1<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Trichlorofluoromethane | 624/8240(5030)/8260(5030) | 2 | 17-181 | 0-65 | 0.85 | 5.0 |
| 1,2,3-Trichloropropane | 8240(5030)/8260(5030) | 2 | 44-103 | 0-40 | 1.3 | 5.0 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 8240***(5030) | 2 | 82-130 | 0-23 | 3.1 | 5.0 |
| 1,2,4-Trimethylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| 1,3,5-Trimethylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| Vinyl acetate<br>(MS - CLP 10/92) | 8240(5030)/8260(5030) | 2 | 49-147 | 0-40 | 1.6 | 10 |
| Vinyl chloride<br>(MS - CLP 10/92) | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 43-137<br>NA<br>60-140 | 0-33<br>NA<br>NA | 1.9<br>10<br>1.0 | 10<br>10<br>1.0 |
| Xylenes (total) | 8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 66-114<br>NA<br>NA | 0-40<br>NA<br>NA | 1.1<br>10<br>1.0 | 5.0<br>10<br>1.0 |
| Surrogate -<br>Toluene-d8 | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 77-120<br>88-110 | NA<br>NA | NA<br>NA | NA<br>NA |
| Surrogate -<br>p-Bromofluorobenzene | 624/8240(5030)/8260(5030)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 80-125<br>86-115<br>80-120 | NA<br>NA<br>NA | NA<br>NA<br>NA | NA<br>NA<br>NA |
| Surrogate -<br>Dibromofluoromethane | 8260(5030) | 2 | 86-118 | NA | NA | NA |
| Surrogate -<br>1,2-Dichloroethane-d4 | 624/8240(5030)<br>CLP 3/90 | 1/2<br>62 | 80-125<br>76-114 | NA<br>NA | NA<br>NA | NA<br>NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Acenaphthene<br>(MS - Except CLP 10/92) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 60-122<br>46-118<br>NA | 0-25<br>0-31<br>NA | 0.56<br>10<br>5.0 | 10<br>10<br>5.0 |
| Acenaphthylene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 79-118<br>NA<br>NA | 0-19<br>NA<br>NA | 0.91<br>10<br>5.0 | 10<br>10<br>5.0 |
| Acetophenone | 8270(3520) | 2 | 10-150 | 0-50 | 0.57 | 10 |
| 2-Acetylaminofluorene | 8270(3520) | 2 | 25-150 | 0-50 | 0.77 | 10 |
| Aldrin | 625/8270(3520) | 1/2 | 59-154 | 0-33 | 1.1 | 10 |
| 4-Aminobiphenyl | 8270(3520) | 2 | 10-150 | 0-50 | 0.70 | 10 |
| Aniline | 8270(3520) | 2 | 10-150 | 0-50 | 8.1 | 50 |
| Anthracene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 74-137<br>NA<br>NA | 0-32<br>NA<br>NA | 0.62<br>10<br>5.0 | 10<br>10<br>5.0 |
| Aramite | 8270(3520) | 2 | 40-150 | 0-50 | 0.33 | 10 |
| Benzidine | 625/8270(3520) | 1/2 | 10-200 | 0-100 | 20 | 80 |
| Benzoic acid | 8270(3520) | 2 | 10-150 | 0-50 | 12 | 50 |
| Benzo(a)anthracene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 65-142<br>NA<br>NA | 0-32<br>NA<br>NA | 0.56<br>10<br>5.0 | 10<br>10<br>5.0 |
| Benzo(b)fluoranthene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 72-144<br>NA<br>NA | 0-34<br>NA<br>NA | 0.55<br>10<br>5.0 | 10<br>10<br>5.0 |
| Benzo(k)fluoranthene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 60-165<br>NA<br>NA | 0-36<br>NA<br>NA | 0.70<br>10<br>5.0 | 10<br>10<br>5.0 |
| Benzo(g,h,i)perylene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 60-135<br>NA<br>NA | 0-33<br>NA<br>NA | 0.32<br>10<br>5.0 | 10<br>10<br>5.0 |
| Benzo(a)pyrene<br>(MS - CLP 10/92) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 70-138<br>NA<br>50-120 | 0-35<br>NA<br>NA | 0.59<br>10<br>5.0 | 10<br>10<br>5.0 |
| Benzyl alcohol | 8270(3520) | 2 | 10-150 | 0-50 | 1.3 | 10 |
| Benzyl chloride | 8270(3520) | 2 | 10-150 | 0-50 | 2.5 | 10 |
| alpha-BHC | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 0.95 | 10 |
| beta-BHC | 625/8270(3520) | 1/2 | 87-139 | 0-12 | 1.0 | 10 |
| delta-BHC | 625/8270(3520) | 1/2 | 78-152 | 0-16 | 1.0 | 10 |
| gamma-BHC | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 1.3 | 10 |
| Bis(2-chloroethoxy) methane | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 59-112<br>NA<br>NA | 0-27<br>NA<br>NA | 1.2<br>10<br>5.0 | 10<br>10<br>5.0 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Bis(2-chloroethyl) ether<br>(MS- CLP 10/92) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 56-107<br>NA<br>50-110 | 0-31<br>NA<br>NA | 0.74<br>10<br>5.0 | 10<br>10<br>5.0 |
| Bis(2-chloroisopropyl) ether | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 4-162<br>NA<br>NA | 0-29<br>NA<br>NA | 0.79<br>10<br>5.0 | 10<br>10<br>5.0 |
| Bis(2-ethylhexyl) phthalate | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 7-190<br>NA<br>NA | 0-39<br>NA<br>NA | 2.2<br>10<br>5.0 | 10<br>10<br>5.0 |
| 4-Bromophenyl phenyl ether | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 55-133<br>NA<br>NA | 0-32<br>NA<br>NA | 0.33<br>10<br>5.0 | 10<br>10<br>5.0 |
| Butyl benzyl phthalate | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 30-168<br>NA<br>NA | 0-30<br>NA<br>NA | 0.70<br>10<br>5.0 | 10<br>10<br>5.0 |
| Carbazole | 8270(3520)***<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 1.3<br>10 | 10<br>10 |
| technical Chlordane | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 12 | 50 |
| p-Chloroaniline<br>(MS - CLP 10/92) | 8270(3520)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 10-150<br>NA<br>10-120 | 0-50<br>NA<br>NA | 4.4<br>10<br>5.0 | 20<br>10<br>5.0 |
| 4-Chloro-3-methyl-phenol<br>(MS - Except CLP 10/92)) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 56-118<br>23-97<br>NA | 0-20<br>0-42<br>NA | 0.54<br>10<br>5.0 | 10<br>10<br>5.0 |
| 1-Chloronaphthalene | 8270(3520) | 2 | 10-150 | 0-50 | 2.5 | 10 |
| 2-Chloronaphthalene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 72-106<br>NA<br>NA | 0-23<br>NA<br>NA | 0.43<br>10<br>5.0 | 10<br>10<br>5.0 |
| 2-Chlorophenol<br>(MS - All methods) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 54-107<br>27-123<br>50-110 | 0-26<br>0-40<br>NA | 0.70<br>10<br>5.0 | 10<br>10<br>5.0 |
| 4-Chlorophenylphenyl ether | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 62-127<br>NA<br>NA | 0-30<br>NA<br>NA | 0.66<br>10<br>5.0 | 10<br>10<br>5.0 |
| Chrysene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 53-148<br>NA<br>NA | 0-33<br>NA<br>NA | 0.31<br>10<br>5.0 | 10<br>10<br>5.0 |
| 3-Methyl phenol (m-Cresol) | 8270(3520) | 2 | 10-150 | 0-50 | 0.57 | 10 |
| 2-Methyl phenol (o-Cresol) | 8270(3520)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 10-150<br>NA<br>NA | 0-50<br>NA<br>NA | 0.71<br>10<br>5.0 | 10<br>10<br>5.0 |
| 4-Methyl phenol (p-Cresol) | 8270(3520)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 10-150<br>NA<br>NA | 0-50<br>NA<br>NA | 1.4<br>10<br>5.0 | 10<br>10<br>5.0 |
| 4,4'-DDD | 625/8270(3520) | 1/2 | 25-198 | 0-27 | 1.4 | 10 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| 4,4'-DDE | 625/8270(3520) | 1/2 | 49-172 | 0-26 | 1.1 | 10 |
| 4,4'-DDT | 625/8270(3520) | 1/2 | DL-207 | 0-50 | 1.9 | 10 |
| Diallate | 8270(3520) | 2 | 10-150 | 0-50 | 1.0 | 10 |
| Dibenz(a,h)anthracene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 61-140<br>NA<br>NA | 0-33<br>NA<br>NA | 0.50<br>10<br>5.0 | 10<br>10<br>5.0 |
| Dibenzofuran | 8270(3520)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 10-150<br>NA<br>NA | 0-50<br>NA<br>NA | 0.67<br>10<br>5.0 | 10<br>10<br>5.0 |
| Di-n-butyl phthalate | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 55-135<br>NA<br>NA | 0-32<br>NA<br>NA | 0.56<br>10<br>5.0 | 10<br>10<br>5.0 |
| 1,2-Dichlorobenzene | 625/8270(3520)<br>CLP 3/90 | 1/2<br>62 | 38-86<br>NA | 0-31<br>NA | 0.62<br>10 | 10<br>10 |
| 1,3-Dichlorobenzene | 625/8270(3520)<br>CLP 3/90 | 1/2<br>62 | 30-76<br>NA | 0-35<br>NA | 0.35<br>10 | 10<br>10 |
| 1,4-Dichlorobenzene<br>(MS - All methods) | 625/8270(3520)<br>CLP 3/90 | 1/2<br>62 | 47-103<br>36-97 | 0-45<br>0-28 | 0.49<br>10 | 10<br>10 |
| 3,3'-Dichlorobenzidine | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | DL-171<br>NA<br>NA | 0-193<br>NA<br>NA | 14<br>10<br>5.0 | 20<br>10<br>5.0 |
| 2,4-Dichlorophenol | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 42-140<br>NA<br>NA | 0-24<br>NA<br>NA | 0.79<br>10<br>5.0 | 10<br>10<br>5.0 |
| 2,6-Dichlorophenol | 8270(3520) | 2 | 10-150 | 0-50 | 0.49 | 10 |
| Dieldrin | 625/8270(3520) | 1/2 | 35-198 | 0-27 | 3.0 | 10 |
| Diethyl phthalate<br>(MS - CLP 10/92) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 70-125<br>NA<br>50-120 | 0-8<br>NA<br>NA | 0.57<br>10<br>5.0 | 10<br>10<br>5.0 |
| p-(Dimethylamino)azobenzene | 8270(3520) | 2 | 10-150 | 0-50 | 0.99 | 10 |
| 7,12-Dimethylbenz(a)anthracene | 8270(3520) | 2 | 10-150 | 0-50 | 0.67 | 10 |
| 3,3'-Dimethylbenzidine | 8270(3520) | 2 | 10-200 | 0-100 | 6.6 | 200 |
| a,a-Dimethylphenethylamine | 8270(3520) | 2 | 10-200 | 0-50 | 460 | 2000 |
| 2,4-Dimethylphenol | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 51-117<br>NA<br>NA | 0-47<br>NA<br>NA | 1.5<br>10<br>5.0 | 10<br>10<br>5.0 |
| Dimethylphthalate | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 78-119<br>NA<br>NA | 0-9<br>NA<br>NA | 0.48<br>10<br>5.0 | 10<br>10<br>5.0 |
| m-Dinitrobenzene | 8270(3520) | 2 | 10-150 | 0-50 | 0.56 | 10 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| 4,6-Dinitro-2-methylphenol | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | DL-231<br>NA<br>NA | 0-23<br>NA<br>NA | 0.65<br>25<br>20 | 50<br>25<br>20 |
| 2,4-Dinitrophenol | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | DL-256<br>NA<br>NA | 0-41<br>NA<br>NA | 6.6<br>25<br>20 | 50<br>25<br>20 |
| 2,4-Dinitrotoluene<br>(MS - All methods) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 42-166<br>NA<br>30-120 | 0-33<br>NA<br>NA | 0.44<br>10<br>5.0 | 10<br>10<br>5.0 |
| 2,6-Dinitrotoluene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 70-127<br>NA<br>NA | 0-12<br>NA<br>NA | 0.64<br>10<br>5.0 | 10<br>10<br>5.0 |
| Dinoseb (2-sec-Butyl-4,6-dinitrophenol) | 8270(3520) | 2 | 10-150 | 0-50 | 0.30 | 10 |
| Di-n-octyl phthalate | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | DL-264<br>NA<br>NA | 0-38<br>NA<br>NA | 0.14<br>10<br>5.0 | 10<br>10<br>5.0 |
| 1,4-Dioxane | 8270***V(3520) | 2 | 10-150 | 0-50 | 0.76 | 10 |
| Diphenylamine/<br>N-nitrosodiphenylamine<br>(MS - CLP 10/92) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 10-150<br>NA<br>30-110 | 0-50<br>NA<br>NA | 1.0<br>10<br>5.0 | 10<br>10<br>5.0 |
| 1,2-Diphenyl hydrazine | 8270(3520) | 2 | 10-150 | 0-50 | 1.2 | 10 |
| Endosulfan I | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 1.2 | 20 |
| Endosulfan II | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 1.9 | 20 |
| Endosulfan sulfate | 625/8270(3520) | 1/2 | 45-171 | 0-25 | 1.5 | 20 |
| Endrin | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 2.2 | 20 |
| Endrin aldehyde | 625/8270(3520) | 1/2 | DL-741 | 0-59 | 3.0 | 50 |
| Endrin ketone | 8270/(3520) | 2 | 10-150 | 0-50 | 12 | 50 |
| Ethyl carbamate | 8270***V(3520) | 2 | 52-100 | 0-24 | 2.5 | |
| Ethyl methane sulfonate | 8270(3520) | 2 | 10-150 | 0-50 | 0.39 | 10 |
| Fluoranthene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 75-135<br>NA<br>NA | 0-31<br>NA<br>NA | 0.60<br>10<br>5.0 | 10<br>10<br>5.0 |
| Fluorene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 80-131<br>NA<br>NA | 0-17<br>NA<br>NA | 0.78<br>10<br>5.0 | 10<br>10<br>5.0 |
| Heptachlor | 625/8270(3520) | 1/2 | 33-178 | 0-36 | 1.5 | 20 |
| Heptachlor epoxide | 625/8270(3520) | 1/2 | 48-184 | 0-25 | 1.7 | 20 |
| Hexachlorobenzene<br>(MS - CLP 10/92) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 61-132<br>NA<br>40-120 | 0-14<br>NA<br>NA | 0.46<br>10<br>5.0 | 10<br>10<br>5.0 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Hexachlorobutadiene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 25-117<br>NA<br>NA | 0-43<br>NA<br>NA | 0.46<br>10<br>5.0 | 10<br>10<br>5.0 |
| Hexachlorocyclopentadiene | 8270(3520)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 10-150<br>NA<br>NA | 0-50<br>NA<br>NA | 1.6<br>10<br>5.0 | 10<br>10<br>5.0 |
| Hexachloroethane<br>(MS - CLP 10/92) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 19-79<br>NA<br>20-110 | 0-33<br>NA<br>NA | 0.32<br>10<br>5.0 | 10<br>10<br>5.0 |
| Hexachlorophene | 8270(3520) | 2 | 10-200 | 0-80 | 1200 | 5000 |
| Hexachloropropene | 8270(3520) | 2 | 10-150 | 0-50 | 0.27 | 10 |
| Indeno(1,2,3-cd)pyrene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 67-134<br>NA<br>NA | 0-35<br>NA<br>NA | 0.52<br>10<br>5.0 | 10<br>10<br>5.0 |
| Isophorone<br>(MS - CLP 10/92) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 68-134<br>NA<br>50-110 | 0-22<br>NA<br>NA | 0.63<br>10<br>5.0 | 10<br>10<br>5.0 |
| Isosafrole | 8270(3520) | 2 | 10-150 | 0-50 | 0.88 | 10 |
| Kepone | 8270(3520) | 2 | 10-150 | 0-50 | 2.5 | 10 |
| Methapyrilene | 8270(3520) | 2 | 10-150 | 0-50 | 900 | 2000 |
| 3-Methylcholanthrene | 8270(3520) | 2 | 10-150 | 0-50 | 0.50 | 10 |
| Methylmethanesulfonate | 8270(3520) | 2 | 10-150 | 0-50 | 0.44 | 10 |
| 2-Methylnaphthalene | 8270(3520)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 10-150<br>NA<br>NA | 0-50<br>NA<br>NA | 0.48<br>10<br>5.0 | 10<br>10<br>5.0 |
| 1-Methylnaphthalene | 8270(3520) | 2 | 10-150 | 0-50 | 2.5 | 10 |
| Naphthalene<br>(MS - CLP 10/92) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 63-113<br>NA<br>30-110 | 0-25<br>NA<br>NA | 0.54<br>10<br>5.0 | 10<br>10<br>5.0 |
| 1,4-Napthoquinone | 8270(3520) | 2 | 10-150 | 0-50 | 0.81 | 10 |
| 1-Napthylamine | 8270(3520) | 2 | 10-150 | 0-50 | 0.93 | 10 |
| 2-Napthylamine | 8270(3520) | 2 | 10-150 | 0-50 | 0.82 | 10 |
| Nicotine | 8270(3520) | 2 | 10-150 | 0-50 | 25 | 100 |
| 2-Nitroaniline | 8270(3520)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 10-150<br>NA<br>NA | 0-50<br>NA<br>NA | 0.53<br>25<br>20 | 50<br>25<br>20 |
| 3-Nitroaniline | 8270(3520)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 10-150<br>NA<br>NA | 0-50<br>NA<br>NA | 3.6<br>25<br>20 | 50<br>25<br>20 |
| 4-Nitroaniline | 8270(3520)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 10-150<br>NA<br>NA | 0-50<br>NA<br>NA | 1.9<br>25<br>20 | 50<br>25<br>20 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Nitrobenzene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 57-121<br>NA<br>NA | 0-25<br>NA<br>NA | 0.54<br>10<br>5.0 | 10<br>10<br>5.0 |
| 2-Nitrophenol | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 40-142<br>NA<br>NA | 0-28<br>NA<br>NA | 0.42<br>10<br>5.0 | 10<br>10<br>5.0 |
| 4-Nitrophenol<br>(MS - Except CLP 10/92)) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 17-153<br>10-80<br>NA | 0-33<br>0-50<br>NA | 0.77<br>25<br>20 | 50<br>25<br>20 |
| 4-Nitroquinoline-1-oxide | 8270(3520) | 2 | 10-150 | 0-50 | 36 | 100 |
| N-Nitrosodi-n-butylamine | 8270(3520) | 2 | 10-150 | 0-50 | 0.64 | 10 |
| N-Nitrosodiethylamine | 8270(3520) | 2 | 10-150 | 0-50 | 0.75 | 10 |
| N-Nitrosodimethylamine | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 0.54 | 10 |
| N-Nitrosodi-n-propylamine<br>(MS - All methods) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 40-145<br>41-116<br>30-110 | 0-39<br>0-38<br>NA | 1.1<br>10<br>5.0 | 10<br>10<br>5.0 |
| N-Nitrosomethylethylamine | 8270(3520) | 2 | 10-150 | 0-50 | 0.64 | 10 |
| N-Nitrosomorpholine | 8270(3520) | 2 | 10-150 | 0-50 | 0.80 | 10 |
| N-Nitrosopiperidine | 8270(3520) | 2 | 10-150 | 0-50 | 0.80 | 10 |
| N-Nitrosopyrrolidine | 8270(3520) | 2 | 10-150 | 0-50 | 1.2 | 10 |
| 5-Nitro-o-toluidine | 8270(3520) | 2 | 10-150 | 0-50 | 0.52 | 10 |
| PCB-1016 | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 120 | 500 |
| PCB-1221 | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 120 | 500 |
| PCB-1232 | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 120 | 500 |
| PCB-1242 | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 120 | 500 |
| PCB-1248 | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 120 | 500 |
| PCB-1254 | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 120 | 500 |
| PCB-1260 | 625/8270(3520) | 1/2 | 10-150 | 0-50 | 120 | 500 |
| Pentachlorobenzene | 8270(3520) | 2 | 10-150 | 0-50 | 0.76 | 10 |
| Pentachloronitrobenzene | 8270(3520) | 2 | 10-150 | 0-50 | 0.57 | 10 |
| Pentachlorophenol<br>(MS - All methods) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 16-138<br>9-103<br>NA | 0-33<br>0-50<br>NA | 1.2<br>25<br>20 | 50<br>25<br>20 |
| Phenacetin | 8270(3520) | 2 | 10-150 | 0-50 | 0.81 | 10 |
| Phenanthrene | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 78-135<br>NA<br>NA | 0-30<br>NA<br>NA | 0.35<br>10<br>5.0 | 10<br>10<br>5.0 |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Phenol<br>(MS - All methods) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 40-113<br>12-110<br>40-120 | 0-31<br>0-42<br>NA | 0.93<br>10<br>5.0 | 10<br>10<br>5.0 |
| p-Phenylenediamine | 8270(3520) | 2 | 10-200 | 0-50 | 760 | 2000 |
| 2-Picoline | 8270(3520) | 2 | 10-150 | 0-50 | 2.2 | 200 |
| Pronamide | 8270(3520) | 2 | 10-150 | 0-50 | 0.65 | 10 |
| Pyrene<br>(MS - Except CLP 10/92) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 46-168<br>26-127<br>NA | 0-36<br>0-31<br>NA | 0.49<br>10<br>5.0 | 10<br>10<br>5.0 |
| Pyridine | 8270(3520) | 2 | 10-150 | 0-50 | 1.9 | 200 |
| Safrole | 8270(3520) | 2 | 10-150 | 0-50 | 0.52 | 10 |
| Strychnine | 8270(3520) | 2 | 10-150 | 0-50 | 25 | 100 |
| 1,2,4,5-Tetrachlorobenzene | 8270(3520) | 2 | 10-150 | 0-50 | 0.55 | 10 |
| Trichlorophenols (2,4,5 and 2,4,6) | 8270(3520) | 2 | NA | NA | 0.57 | 10 |
| 2,3,4,5-Tetrachlorophenol | 8270***(3520) | 2 | 10-150 | 0-50 | 12 | 50 |
| 2,3,4,6-Tetrachlorophenol | 8270(3520) | 2 | 45-129 | 0-22 | 0.68 | 50 |
| o-Toluidine | 8270(3520) | 2 | 10-150 | 0-50 | 1.1 | 10 |
| Toxaphene | 625/8270(3520) | 1/2 | 10-200 | 0-80 | 500 | 2000 |
| 1,2,4-Trichlorobenzene<br>(MS - All methods) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 48-111<br>39-98<br>40-100 | 0-31<br>0-28<br>NA | 0.38<br>10<br>5.0 | 10<br>10<br>5.0 |
| Tetrachlorophenols (2,3,4,5 and 2,3,4,6) | 8270(3520) | 2 | NA | NA | 1.3 | 50 |
| 2,4,5-Trichlorophenol | 8270(3520)<br>CLP 3/90<br>CLP 10/92 | 2<br>62<br>6 | 45-113<br>NA<br>NA | 0-21<br>NA<br>NA | 0.59<br>25<br>20 | 10<br>25<br>20 |
| 2,4,6-Trichlorophenol<br>(MS - CLP 10/92) | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 43-136<br>NA<br>40-120 | 0-16<br>NA<br>NA | 0.57<br>10<br>5.0 | 10<br>10<br>5.0 |
| o,o,o-Triethyl-phosphorothioate | 8270(3520) | 2 | 10-150 | 0-50 | 0.48 | 10 |
| 1,3,5-Trinitrobenzene | 8270(3520) | 2 | 10-150 | 0-50 | 0.33 | 200 |
| Surrogate -<br>Nitrobenzene-d5 | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 32-117<br>35-114<br>40-112 | NA<br>NA<br>NA | NA<br>NA<br>NA | NA<br>NA<br>NA |
| Surrogate -<br>2-Fluorobiphenyl | 625/8270(3520)<br>CLP 3/90<br>CLP 10/92 | 1/2<br>62<br>6 | 31-118<br>43-116<br>42-110 | NA<br>NA<br>NA | NA<br>NA<br>NA | NA<br>NA<br>NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Surrogate - p-Terphenyl-d14 | 8270(3520) | 2 | 33-141 | NA | NA | NA |
| | CLP 3/90 | 62 | 33-141 | NA | NA | NA |
| | CLP 10/92 | 6 | 24-140 | NA | NA | NA |
| Surrogate - Phenol-d5 | 625/8270(3520) | 1/2 | 10-106 | NA | NA | NA |
| | CLP 3/90 | 62 | 10-110 | NA | NA | NA |
| | CLP 10/92 | 6 | 17-113 | NA | NA | NA |
| Surrogate - 2-Fluorophenol | 8270(3520) | 2 | 10-104 | NA | NA | NA |
| | CLP 3/90 | 62 | 21-110 | NA | NA | NA |
| | CLP 10/92 | 6 | 16-108 | NA | NA | NA |
| Surrogate - 2,4,6-Tribromophenol | 8270(3520) | 2 | 41-143 | NA | NA | NA |
| | CLP 3/90 | 62 | 10-123 | NA | NA | NA |
| | CLP 10/92 | 6 | 18-126 | NA | NA | NA |
| Surrogate - 2-Chlorophenol-d4 | CLP 3/90 | 62 | 33-110 | NA | NA | NA |
| Surrogate - 1,2-Dichlorobenzene-d4 | CLP 3/90 | 62 | 16-110 | NA | NA | NA |

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) (MS) | 613/8280<br>8270 (Screen) | 1/2<br>2 | 63-137<br>NA | 0-40<br>NA | 0.0042<br>10 | 0.0050<br>10 |
| Polychlorinated Dibenzo-p-dioxin and Dibenzofuran classes | | | | | | |
| tetra-CDD (MS) | 8280 | 2 | 63-137 | 0-40 | 0.0042 | 0.0050 |
| tetra-CDF (MS) | 8280 | 2 | 60-142 | 0-40 | 0.0037 | 0.0050 |
| penta-CDD (MS) | 8280 | 2 | 37-163 | 0-40 | 0.0035 | 0.0050 |
| penta-CDF (MS) | 8280 | 2 | 52-148 | 0-40 | 0.0038 | 0.0050 |
| hexa-CDD (MS) | 8280 | 2 | 42-158 | 0-40 | 0.0041 | 0.0050 |
| hexa-CDF (MS) | 8280 | 2 | 58-142 | 0-40 | 0.0029 | 0.0050 |
| hepta-CDD (MS) | 8280 | 2 | 20-170 | 0-50 | 0.0025 | 0.010 |
| hepta-CDF (MS) | 8280 | 2 | 20-170 | 0-50 | 0.0056 | 0.010 |
| octa-CDD (MS) | 8280 | 2 | 20-170 | 0-50 | 0.0095 | 0.010 |
| octa-CDF (MS) | 8280 | 2 | 20-170 | 0-50 | 0.0072 | 0.010 |
| Internal Standard - $^{13}C_{12}$-2,3,7,8-TCDD | 613<br>8280 | 1<br>2 | > 50<br>40-120 | NA<br>NA | NA<br>NA | NA<br>NA |
| Internal Standard - $^{13}C_{12}$-OCDD | 8280 | 2 | 40-120 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Benfluralin | 627 | 9 | 40-140 | 0-40 | 0.0025 | 0.010 |
| Ethalfluralin | 627 | 9 | 40-140 | 0-50 | 0.50 | 2.0 |
| Isopropalin | 627 | 9 | 48-140 | 0-50 | 0.025 | 0.10 |
| Profluralin | 627 | 9 | 55-140 | 0-50 | 0.050 | 0.20 |
| Trifluralin (MS) | 627 | 9 | 17-140 | 0-50 | 0.0025 | 0.010 |
| Surrogate - 2,4,5,6-Tetrachloro-m-xylene | 627 | 9 | 22-126 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Amobam | 630 | 63 | 70-130 | 0-20 | * | * |
| Ferbam | 630 | 63 | 70-130 | 0-20 | * | * |
| Mancozeb | 630 | 63 | 70-130 | 0-20 | * | * |
| Maneb | 630 | 63 | 70-130 | 0-20 | * | * |
| Metham | 630 | 63 | 70-130 | 0-20 | * | * |
| Nabam | 630 | 63 | 70-130 | 0-20 | * | * |
| Polyram | 630 | 63 | 70-130 | 0-20 | * | * |
| Zineb | 630 | 63 | 70-130 | 0-20 | * | * |
| Ziram | 630 | 63 | 70-130 | 0-20 | 5.0 | 20 |
| Benomyl (as Carbenazim) | 631 | 55 | 50-126 | 0-30 | 1.2 | 5.0 |

* All compounds reported as Ziram

## TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Aminocarb | 632 | 13 | 60-125 | 0-30 | 0.25 | 1.0 |
| Barban | 632 | 13 | 55-125 | 0-30 | 0.25 | 1.0 |
| Bromacil | 632*** | 13 | 52-125 | 0-30 | 0.19 | 2.0 |
| Carbaryl (MS) | 632 | 13 | 55-125 | 0-30 | 0.31 | 5.0 |
| Carbofuran | 632 | 13 | 55-125 | 0-30 | 2.5 | 10 |
| Chlorphropham | 632 | 13 | 55-125 | 0-30 | 0.25 | 1.0 |
| Diuron (MS) | 632 | 13 | 55-125 | 0-30 | 0.016 | 1.0 |
| Fenuron | 632 | 13 | 60-125 | 0-30 | 1.2 | 5.0 |
| Fluomethuron | 632 | 13 | 59-125 | 0-40 | 0.25 | 1.0 |
| Linuron | 632 | 13 | 55-125 | 0-30 | 0.036 | 1.0 |
| Methomyl | 632 | 13 | 52-132 | 0-30 | 0.25 | 1.0 |
| Methiocarb | 632 | 13 | 51-137 | 0-30 | 1.2 | 5.0 |
| Monuron | 632 | 13 | 56-132 | 0-30 | 0.25 | 1.0 |
| Neburon | 632 | 13 | 54-126 | 0-30 | 0.25 | 1.0 |
| Oxamyl | 632 | 13 | 57-125 | 0-30 | 0.25 | 10 |
| Propham | 632 | 13 | 50-125 | 0-30 | 0.25 | 1.0 |
| Propoxur | 632 | 13 | 56-125 | 0-30 | 0.53 | 1.0 |
| Siduron | 632 | 13 | 55-125 | 0-30 | 0.25 | 1.0 |
| Swep | 632 | 13 | 58-125 | 0-30 | 0.25 | 1.0 |
| Surrogate - Propachlor | 632 | 13 | 45-125 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Bromacil | 633 | 41 | 52-125 | 0-30 | 0.50 | 2.0 |
| DEET | 633 | 41 | 52-125 | 0-30 | 1.2 | 5.0 |
| Hexazinone | 633 | 41 | 52-125 | 0-30 | 0.12 | 0.50 |
| Metribuzin | 633 | 41 | 50-125 | 0-30 | 0.25 | 1.0 |
| Terbacil | 633 | 41 | 50-130 | 0-30 | 1.2 | 5.0 |
| Triadimefon | 633 | 41 | 48-125 | 0-30 | 0.25 | 1.0 |
| Tricyclazole | 633 | 41 | 53-125 | 0-30 | 1.2 | 5.0 |
| Surrogate - Triphenylphosphate | 633 | 41 | 40-125 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Butylate (MS) | 634 | 15 | 38-145 | 0-76 | 0.28 | 2.0 |
| Cycloate | 634 | 15 | 46-159 | 0-47 | 0.24 | 2.0 |
| EPTC | 634 | 15 | 46-154 | 0-55 | 0.42 | 2.0 |
| Molinate (MS) | 634 | 15 | 37-127 | 0-74 | 0.21 | 2.0 |
| Pebulate | 634 | 15 | 22-172 | 0-50 | 0.23 | 2.0 |
| Vernolate | 634 | 15 | 39-147 | 0-45 | 0.19 | 2.0 |
| Surrogate - Tokuthion | 634 | 15 | 44-125 | NA | NA | NA |
| Surrogate - Triphenylphosphate | 634 | 15 | 40-125 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Rotenone | 635 | 19 | 59-125 | 0-30 | 0.50 | 2.0 |
| Bensulide | 636 | 16 | 22-140 | 0-50 | 0.50 | 2.0 |
| Oryzalin | 638 | 21 | 50-130 | 0-30 | 0.076 | 1.0 |
| Bendiocarb | 639 | 20 | 10-165 | 0-50 | 0.50 | 2.0 |
| Bentazon | 643 | 59 | 50-150 | 0-40 | 1.2 | 5.0 |
| Picloram | 644 | 64 | 44-138 | 0-40 | 0.12 | 0.50 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Alachlor (MS) | 645 | 28 | 45-140 | 0-30 | 0.25 | 1.0 |
| Butachlor | 645 | 28 | 50-124 | 0-40 | 0.25 | 1.0 |
| Diphenamid | 645 | 28 | 57-119 | 0-40 | 0.25 | 1.0 |
| Fluridone | 645 | 28 | 45-154 | 0-40 | 0.25 | 1.0 |
| Lethane | 645 | 28 | 33-153 | 0-50 | 0.25 | 1.0 |
| Norflurazon | 645 | 28 | 48-110 | 0-40 | 0.25 | 1.0 |
| Surrogate - Triphenylphosphate | 645 | 28 | 40-125 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Acenaphthene (MS) | 8310 | 2 | 44-162 | 0-52 | 0.31 | 1.0 |
| Acenaphthylene | 8310 | 2 | 10-139 | 0-40 | 0.15 | 1.0 |
| Anthracene | 8310 | 2 | 10-126 | 0-40 | 0.0077 | 0.20 |
| Benzo(a)anthracene | 8310 | 2 | 12-135 | 0-40 | 0.011 | 0.20 |
| Benzo(b)fluoranthene | 8310 | 2 | 6-150 | 0-40 | 0.0075 | 0.20 |
| Benzo(k)fluoranthene | 8310 | 2 | 10-159 | 0-40 | 0.0082 | 0.50 |
| Benzonitrile | 8310*** | 2 | 10-200 | 0-40 | 2.50 | 10 |
| Benzo(g,h,i)perylene | 8310 | 2 | 10-120 | 0-40 | 0.031 | 0.50 |
| Benzo(a)pyrene | 8310 | 2 | 10-128 | 0-40 | 0.0077 | 0.20 |
| Carbazole | 8310*** | 2 | 10-150 | 0-40 | 0.25 | 1.0 |
| Chrysene (MS) | 8310 | 2 | 10-199 | 0-40 | 0.0088 | 0.20 |
| Dibenz(a,h)acridine | 8310*** | 2 | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | 8310 | 2 | 10-110 | 0-40 | 0.027 | 1.0 |
| Fluoranthene | 8310 | 2 | 41-155 | 0-54 | 0.017 | 0.50 |
| Fluorene (MS) | 8310 | 2 | 10-142 | 0-40 | 0.037 | 0.50 |
| Indene | 8310*** | 2 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 8310 | 2 | 10-116 | 0-40 | 0.0091 | 0.50 |
| 6-Methyl chrysene | 8310*** | 2 | NA | NA | NA | NA |
| 1-Methylnaphthalene | 8310*** | 2 | 10-125 | 0-40 | 0.25 | 1.0 |
| 2-Methylnaphthalene | 8310*** | 2 | 10-125 | 0-40 | 0.25 | 1.0 |
| Naphthalene (MS) | 8310 | 2 | 50-135 | 0-40 | 0.26 | 1.0 |
| Phenanthrene | 8310 | 2 | 10-155 | 0-40 | 0.024 | 0.20 |
| Pyrene (MS) | 8310 | 2 | 50-158 | 0-43 | 0.063 | 0.50 |
| Thiophenol | 8310*** | 2 | NA | NA | NA | NA |
| Surrogate - 4-Terphenyl-d4 | 8310 | 2 | 60-140 | NA | NA | NA |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| Acetaldehyde | 8315 | 2 | 30-110 | 0-40 | 50 | 200 |
| Formaldehyde | 8315 | 2 | 50-155 | 0-30 | 14 | 50 |
| Aldicarb (Temik) (MS) | 8318 | 2 | 34-124 | 0-40 | 0.98 | 10 |
| Aldicarb sulfone | 8318 | 2 | 54-116 | 0-40 | 0.55 | 5.0 |
| Aldicarb sulfoxide | 8318*** | 2 | 30-140 | 0-40 | 0.25 | 5.0 |
| Carbaryl (Sevin) | 8318 | 2 | 55-125 | 0-40 | 1.3 | 5.0 |
| Carbofuran (Furadan) (MS) | 8318 | 2 | 55-125 | 0-40 | 1.5 | 10 |
| Dioxacarb | 8318 | 2 | 56-124 | 0-40 | 1.1 | 5.0 |
| 3-Hydroxycarbofuran | 8318 | 2 | 47-123 | 0-40 | 1.5 | 5.0 |
| Methiocarb (Mesurol) | 8318 | 2 | 51-137 | 0-40 | 1.4 | 5.0 |
| Methomyl (Lannate) | 8318 | 2 | 57-125 | 0-40 | 1.8 | 5.0 |
| Oxamyl (MS) | 8318*** | 2 | 50-150 | 0-40 | 1.6 | 5.0 |
| Promecarb | 8318 | 2 | 48-122 | 0-40 | 1.4 | 5.0 |
| Propoxur (Baygon) | 8318 | 2 | 47-127 | 0-40 | 1.5 | 5.0 |

**TABLE 5.1. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/L) | Reporting Limit (ug/L) |
|---|---|---|---|---|---|---|
| 2-Amino-4,6-dinitrotoluene | 8330 | 2 | 65-135 | 0-30 | 0.053 | 0.20 |
| 4-Amino-2,6-dinitrotoluene | 8330 | 2 | 37-140 | 0-30 | 0.069 | 0.50 |
| 1,3-Dinitrobenzene (MS) | 8330 | 2 | 54-166 | 0-30 | 0.019 | 0.20 |
| 2,4-Dinitrotoluene (MS) | 8330 | 2 | 60-140 | 0-30 | 0.019 | 0.20 |
| 2,6-Dinitrotoluene | 8330 | 2 | 60-140 | 0-30 | 0.018 | 0.50 |
| Diphenylamine | 8330***V | 2 | 65-140 | 0-30 | 2.3 | 10 |
| Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) | 8330 | 2 | 54-166 | 0-30 | 0.024 | 1.0 |
| Methyl-2,4,6-trinitro-phenylnitramine (Tetryl) | 8330 | 2 | 41-165 | 0-30 | 0.041 | 0.50 |
| Nitrobenzene | 8330 | 2 | 52-152 | 0-30 | 0.037 | 0.20 |
| Nitroglycerin | 8330***V | 2 | 71-121 | 0-22 | 11 | 10 |
| n-Nitrosodiphenylamine | 8330***V | 2 | 55-121 | 0-30 | 2.2 | 10 |
| 2-Nitrotoluene (MS) | 8330 | 2 | 50-144 | 0-30 | 0.054 | 0.50 |
| 3-Nitrotoluene | 8330 | 2 | 55-165 | 0-30 | 0.048 | 0.50 |
| 4-Nitrotoluene | 8330 | 2 | 54-166 | 0-30 | 0.051 | 0.50 |
| Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) | 8330 | 2 | 54-162 | 0-30 | 0.021 | 1.0 |
| Pentaerythritol tetranitrate (PETN) | 8330*** | 2 | 50-150 | 0-30 | 13 | 20 |
| 1,3,5-Trinitrobenzene | 8330 | 2 | 50-150 | 0-30 | 0.090 | 0.20 |
| 2,4,6-Trinitrotoluene | 8330 | 2 | 50-70 | 0-30 | 9.3 | 0.20 |
| Surrogate - 3,4-Dinitrotoluene | 8330 | 2 | 40-140 | NA | NA | NA |
| Asulam | SL-SOP | 68 | 34-155 | 0-34 | 0.50 | 2.0 |
| Ethylenethiourea | SL-SOP | 68 | 60-111 | 0-36 | 1.2 | 5.0 |
| Thiodiglycol | SL-SOP | 68 | 31-97 | 0-83 | 25 | 100 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (mg/kg) | Reporting Limit (mg/kg) |
|---|---|---|---|---|---|---|
| Aluminum | 6010(3050)<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 2.0<br>40 | 20<br>40 |
| Antimony | 6010(3050)<br>CLP<br>7041(3050)***V | 2<br>45<br>2 | 70-130<br>70-130<br>70-130 | 0-30<br>0-20<br>0-30 | 1.5<br>12<br>0.082 | 5.0<br>12<br>1.0 |
| Arsenic | 6010(3050)<br>7060(3050)<br>7061(3050)<br>CLP | 2<br>2<br>2<br>45 | 70-130<br>70-130<br>70-130<br>70-130 | 0-30<br>0-30<br>0-30<br>0-20 | 1.4<br>0.23<br>0.25<br>2.0 | 10<br>1.0<br>1.0<br>2.0 |
| Barium | 6010(3050)<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 0.059<br>40 | 1.0<br>40 |
| Beryllium | 6010(3050)<br>CLP<br>7091(3050) | 2<br>45<br>2 | 70-130<br>70-130<br>70-130 | 0-30<br>0-20<br>0-30 | 0.095<br>1.0<br>0.25 | 0.50<br>1.0<br>0.10 |
| Boron | 6010(3050)*** | 2 | 70-130 | 0-30 | 1.2 | 5.0 |
| Cadmium | 6010(3050)<br>CLP<br>7131(3050) | 2<br>45<br>2 | 70-130<br>70-130<br>70-130 | 0-30<br>0-20<br>0-30 | 0.15<br>1.0<br>0.25 | 0.50<br>1.0<br>0.10 |
| Calcium | 6010(3050)<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 4.8<br>1000 | 50<br>1000 |
| Chromium | 6010(3050)<br>CLP<br>7191(3050) | 2<br>45<br>2 | 70-130<br>70-130<br>70-130 | 0-30<br>0-20<br>0-30 | 0.80<br>2.0<br>0.25 | 1.0<br>2.0<br>1.0 |
| Cobalt | 6010(3050)<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 0.22<br>10 | 1.0<br>10 |
| Copper | 6010(3050)<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 0.54<br>5.0 | 2.5<br>5.0 |
| Iron | 6010(3050)<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 0.78<br>20 | 5.0<br>20 |
| Lead | 6010(3050)<br>7421(3050)<br>CLP | 2<br>2<br>45 | 70-130<br>70-130<br>70-130 | 0-30<br>0-30<br>0-20 | 0.62<br>0.26<br>0.60 | 5.0<br>0.50<br>0.60 |
| Lithium | 3500-Li B(3050***) | 4/2 | 70-130 | 0-20 | 2.5 | 10 |
| Magnesium | 6010(3050)<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 2.5<br>1000 | 50<br>1000 |
| Manganese | 6010(3050)<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 0.073<br>3.0 | 1.0<br>3.0 |
| Mercury | 7471<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 0.0032<br>0.10 | 0.030<br>0.10 |
| Molybdenum | 6010(3050) | 2 | 70-130 | 0-30 | 0.054 | 1.0 |
| Nickel | 6010(3050)<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 0.50<br>8.0 | 4.0<br>8.0 |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (mg/kg) | Reporting Limit (mg/kg) |
|---|---|---|---|---|---|---|
| Potassium | 6010(3050)<br>CLP<br>7610(3050) | 2<br>45<br>2 | 70-130<br>70-130<br>70-130 | 0-30<br>0-20<br>0-30 | 37<br>1000<br>2.5 | 100<br>1000<br>10 |
| Selenium | 6010(3050)<br>7740(3050)<br>7741(3050)<br>CLP | 2<br>2<br>2<br>45 | 70-130<br>70-130<br>70-130<br>70-130 | 0-30<br>0-30<br>0-30<br>0-20 | 1.9<br>0.27<br>0.25<br>1.0 | 5.0<br>1.0<br>1.0<br>1.0 |
| Silica (acid extractable) | 6010(3050***) | 2 | 70-130 | 0-30 | 12 | 50 |
| Silver | 6010(3050)<br>CLP<br>7761(3050) | 2<br>45<br>2 | 70-130<br>70-130<br>70-130 | 0-30<br>0-20<br>0-30 | 0.18<br>2.0<br>0.025 | 1.0<br>2.0<br>0.10 |
| Sodium | 6010(3050)<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 12<br>1000 | 50<br>1000 |
| Strontium | 6010***(3050***) | 2 | 70-130 | 0-30 | 0.054 | 1.0 |
| Thallium | 6010(3050)<br>7841(3050)<br>CLP | 2<br>2<br>45 | 70-130<br>70-130<br>70-130 | 0-30<br>0-30<br>0-20 | 7.2<br>0.065<br>2.0 | 50<br>1.0<br>2.0 |
| Tin | 6010***V(3050***V) | 2 | 70-130 | 0-30 | 1.5 | 5.0 |
| Titanium | 6010***(3050***) | 2 | 70-130 | 0-30 | 0.25 | 1.0 |
| Tributyl tin | Atomic absorption | 40 | 70-130 | 0-40 | 0.025 | 0.025 |
| Vanadium | 6010(3050)<br>CLP | <br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 1.4<br>10 | 1.0<br>10 |
| Zinc | 6010(3050)<br>CLP | 2<br>45 | 70-130<br>70-130 | 0-30<br>0-20 | 0.58<br>4.0 | 2.0<br>4.0 |
| Zinc Phosphide | FDER Special Method | 31 | NA | NA | NA | NA |
| Zirconium | 6010***(3050***) | 2 | 70-130 | 0-30 | 125 | 500 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (mg/kg) | Reporting Limit (mg/kg) |
|---|---|---|---|---|---|---|
| Ammonia (as N) | EPA-CE:3-140<br>350.3(EPA-CE) | 46<br>3/46 | 75-125<br>75-125 | 0-30<br>0-30 | 0.20<br>0.030 | 0.50<br>0.50 |
| BOD | EPA-CE:3-380 | 46 | 60-140 | 0-40 | NA | 200 |
| BTU | D240-76 | 38 | 70-130 | 0-30 | NA | 200 BTU/lb |
| Carbon, total organic | EPA-CE [Walkley-Black]<br>9060 | 46 [43]<br>2 | 60-140<br>60-140 | 0-40<br>0-40 | 64<br>50 | 100<br>100 |
| Cation exchange capacity | 9080/EPA-CE:3-20<br>9081 | 2/46<br>2 | 70-130<br>70-130 | 0-40<br>0-40 | NA<br>NA | 0.0033 meq/100 g<br>0.0033 meq/100 g |
| Chloride (extractable) | 9251<br>9252<br>4500-$Cl^-$ C | 2<br>2<br>4 | 75-125<br>75-125<br>75-125 | 0-30<br>0-30<br>0-30 | 4.0<br>17<br>5.0 | 20<br>20<br>20 |
| Chloride, total | 9251(5050)<br>9056(5050) | 2<br>2 | 70-130<br>70-130 | 0-40<br>0-40 | NA<br>NA | 200<br>200 |
| COD | EPA-CE:3-373 | 46 | 60-140 | 0-40 | NA | 100 |
| Coliform, fecal | 9221C(EPA/AOAC) | 67/36 | NA | 0-200 | NA | 3 MPN/g |
| Coliform, total | 9221B(EPA/AOAC) | 67/36 | NA | 0-200 | NA | 3 MPN/g |
| Cyanide, amenable to chlorination | 9012(9013)<br>9010 | 2<br>2 | NA<br>NA | 0-50<br>0-40 | NA<br>NA | 1.0<br>1.0 |
| Cyanide, reactive | 7.3.3.2 | 2 | NA | 0-50 | NA | 1.0 |
| Cyanide, total | 9012(9013)<br>9010<br>CLP | 2<br>2<br>45 | 75-125<br>75-125<br>85-115 | 0-30<br>0-30<br>0-25 | 0.59<br>0.14<br>0.30 | 1.0<br>1.0<br>0.30 |
| EP Toxicity | 1310 | 2 | NA | NA | NA | NA |
| Fluoride (extractable) | 340.2 | 3 | 75-125 | 0-25 | 0.40 | 4.0 |
| Halogens, total | 9056(5050) | 2 | 70-130 | 0-40 | NA | 200 |
| Halogens, total organic (EOX) | EPA-600/4-84-008 | 44 | 60-140 | 0-50 | 8.6 | 10 |
| Hydrogen ion (pH) | 9045 | 2 | NA | 0-10 | NA | NA |
| Ignitability | 1010 | 2 | NA | NA | NA | NA |
| Nitrate (as N) | EPA-CE:3-183 | 46 | 75-125 | 0-30 | NA | 5.0 |
| Nitrate-Nitrite (as N) | EPA-CE:3-183 | 46 | 75-125 | 0-30 | 1.2 | 5.0 |
| Nitrite (as N) | EPA-CE:3-183 | 46 | 75-125 | 0-30 | 10 | 5.0 |
| Nitrogen, organic | EPA-CE:3-205 | 46 | NA | NA | NA | 25 |
| Nitrogen, total | TKN + $NO_3/NO_2$ | 46 | NA | NA | NA | 30 |
| Nitrogen, total Kjeldahl | EPA-CE:3-202 | 46 | 65-135 | 0-30 | 17 | 25 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (mg/kg) | Reporting Limit (mg/kg) |
|---|---|---|---|---|---|---|
| Oil and Grease | 9070(9071)<br>413.2(9071) | 2<br>3(2) | 60-140<br>60-140 | 0-50<br>0-50 | 35<br>2.3 | 100<br>10 |
| Orthophosphate (extractable) | 365.1 | 3 | 75-125 | 0-30 | 0.31 | 5.0 |
| Paint filter liquids | 9095 | 2 | NA | 0-40 | NA | NA |
| Petroleum hydrocarbons | 9073 (9071) | 2 | 60-140 | 0-50 | 3.5 | 10 |
| Phenolics, total recoverable | 9066(EPA-CE)<br>9065(EPA-CE) | 2 (46)<br>2 (46) | 60-140<br>60-140 | 0-40<br>0-40 | 0.74<br>0.76 | 1.0<br>1.0 |
| Phosphorus, total | EPA-CE:3-213<br>EPA-CE:3-212 | 46<br>46 | 60-140<br>60-140 | 0-40<br>0-40 | 24<br>6.3 | 25<br>25 |
| Radionuclides, alpha | 9310 | 2 | 64-145 | 0-31 | NA | NA |
| Radionuclides, beta | 9310 | 2 | 67-140 | 0-28 | NA | NA |
| Residue, fixed (% ash) | EPA-CE:3-59 | 46 | NA | 0-40 | NA | 0.10% |
| Solids, total | EPA-CE:3-58 | 46 | NA | 0-30 | NA | 0.10% |
| Solids, volatile | EPA-CE:3-59 | 46 | 75-125 | 0-30 | NA | 0.10% |
| Specific gravity | EPA-CE:3-61 | 46 | NA | 0-10 | NA | NA |
| Streptococcus, fecal | 9230B (EPA/AOAC) | 4 (67/36) | NA | NA | NA | 3 MPN/g |
| Sulfate (extractable) | 9036<br>9038<br>375.3 | 2<br>2<br>3 | 75-125<br>75-125<br>75-125 | 0-30<br>0-30<br>0-30 | 32<br>12<br>25 | 100<br>100<br>100 |
| Sulfide | 9030-SL | 2 | 50-150 | 0-50 | 2.2 | 10 |
| Sulfide, acid volatile | SL SOP | 68 | 50-150 | 0-50 | 2.8 | 10 |
| Sulfide, reactive | 7.3.4.2 | 2 | NA | 0-50 | NA | 10 |
| Sulfur | D129-64/9056(5050) | 38/2 | 70-130 | 0-30 | NA | 170 |
| Toxic compound leaching procedure | 1311 | 48 | NA | NA | NA | NA |
| Water (Karl Fisher) | D1744 | 38 | NA | 0-30 | NA | 50 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Benzyl chloride | 8010(5030) | 2 | 50-150 | 0-30 | 1.2 | 25 |
| Bromobenzene | 8010(5030) | 2 | 70-130 | 0-30 | 12 | 50 |
| Bromodichloromethane | 8010(5030) | 2 | 42-172 | 0-30 | 1.2 | 5.0 |
| Bromoform | 8010(5030) | 2 | 13-159 | 0-30 | 0.65 | 25 |
| Bromomethane | 8010(5030) | 2 | 10-144 | 0-30 | 1.4 | 5.0 |
| Carbon tetrachloride | 8010(5030) | 2 | 43-143 | 0-30 | 1.1 | 5.0 |
| Chlorobenzene (MS) | 8010(5030) | 2 | 31-122 | 0-27 | 1.1 | 5.0 |
| Chloroethane | 8010(5030) | 2 | 46-137 | 0-30 | 1.1 | 5.0 |
| Chloroform | 8010(5030) | 2 | 49-133 | 0-30 | 0.99 | 5.0 |
| 1-Chlorohexane | 8010(5030) | 2 | 50-150 | 0-30 | 1.2 | 5.0 |
| 2-Chloroethylvinyl ether | 8010(5030) | 2 | 14-186 | 0-80 | 12 | 50 |
| Chloromethane | 8010(5030) | 2 | 10-193 | 0-30 | 0.85 | 5.0 |
| 2-Chlorotoluene | 8010(5030) | 2 | 70-130 | 0-30 | 12 | 50 |
| 3-Chlorotoluene | 8010(5030) | 2 | 70-130 | 0-30 | 12 | 50 |
| 4-Chlorotoluene | 8010(5030) | 2 | 70-130 | 0-30 | 12 | 50 |
| Dibromochloromethane | 8010(5030) | 2 | 24-191 | 0-30 | 0.95 | 5.0 |
| Dibromomethane | 8010(5030) | 2 | 70-130 | 0-30 | 6.2 | 25 |
| 1,2-Dichlorobenzene | 8010(5030) | 2 | 10-208 | 0-30 | 1.2 | 5.0 |
| 1,3-Dichlorobenzene | 8010(5030) | 2 | 10-187 | 0-30 | 1.2 | 5.0 |
| 1,4-Dichlorobenzene | 8010(5030) | 2 | 42-143 | 0-30 | 1.2 | 5.0 |
| Dichlorodifluoromethane | 8010(5030) | 2 | 70-130 | 0-30 | 1.2 | 5.0 |
| 1,1-Dichloroethane | 8010(5030) | 2 | 47-132 | 0-30 | 1.0 | 5.0 |
| 1,2-Dichloroethane | 8010(5030) | 2 | 51-147 | 0-30 | 1.2 | 5.0 |
| 1,1-Dichloroethene (MS) | 8010(5030) | 2 | 51-132 | 0-28 | 0.82 | 5.0 |
| cis/trans 1,2-Dichloroethene | 8010(5030) | 2 | 38-155 | 0-30 | 1.7 | 5.0 |
| Dichloromethane (Methylene chloride) | 8010(5030) | 2 | 25-162 | 0-30 | 0.99 | 5.0 |
| 1,2-Dichloropropane | 8010(5030) | 2 | 44-156 | 0-30 | 0.92 | 5.0 |
| cis/trans-1,3-Dichloropropylene | 8010(5030) | 2 | 22-178 | 0-30 | 1.2 | 5.0 |
| 1,1,2,2-Tetrachloroethane | 8010(5030) | 2 | 10-184 | 0-30 | 0.47 | 5.0 |
| 1,1,1,2-Tetrachloroethane | 8010(5030) | 2 | 70-130 | 0-30 | 1.2 | 5.0 |
| Tetrachloroethene | 8010(5030) | 2 | 26-162 | 0-30 | 0.47 | 5.0 |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 8010(5030) | 2 | 41-138 | 0-30 | 1.1 | 5.0 |
| 1,1,2-Trichloroethane | 8010(5030) | 2 | 39-136 | 0-30 | 0.95 | 5.0 |
| Trichloroethene (MS) | 8010(5030) | 2 | 56-133 | 0-26 | 1.3 | 5.0 |
| Trichlorofluoromethane | 8010(5030) | 2 | 21-156 | 0-30 | 0.71 | 5.0 |
| 1,2,3-Trichloropropane | 8010(5030) | 2 | 50-150 | 0-30 | 1.2 | 5.0 |
| Vinyl chloride | 8010(5030) | 2 | 28-163 | 0-30 | 1.2 | 5.0 |
| 1,2-Dibromoethane (EDB) | 8010***(5030) | 2 | 75-125 | 0-30 | 1.2 | 5.0 |
| Surrogate - Bromochloromethane | 8010(5030) | 2 | 43-127 | NA | NA | NA |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Acetone | 8015***(5030) | 2 | 40-130 | 0-30 | 31 | 130 |
| 2-Butanone (MEK) | 8015(5030) | 2 | 60-130 | 0-40 | 20 | 130 |
| Diethyl ether (MS) | 8015(5030) | 2 | 10-130 | 0-50 | 32 | 130 |
| Ethanol | 8015(5030) | 2 | 20-140 | 0-45 | 1200 | 130 |
| Ethyl methacrylate | 8015***(5030) | 2 | 42-125 | 0-40 | 12 | 50 |
| Isobutanol | 8015***(5030) | 2 | 50-120 | 0-40 | 1200 | 5000 |
| Isopropanol | 8015***(5030) | 2 | 30-140 | 0-40 | 1200 | 5000 |
| Methacrylonitrile | 8015***(5030) | 2 | 10-140 | 0-60 | 120 | 500 |
| Methanol | 8015***(5030) | 2 | 50-150 | 0-40 | 1200 | 5000 |
| Methyl methacrylate | 8015***(5030) | 2 | 45-132 | 0-42 | 12 | 50 |
| 4-Methyl-2-pentanone (MIBK) (MS) | 8015(5030) | 2 | 65-125 | 0-40 | 32 | 130 |
| Methyl t-butyl ether (MTBE) | 8015***(5030) | 2 | 50-150 | 0-30 | 23 | 50 |
| Propionitrile | 8015***(5030) | 2 | 10-130 | 0-50 | 120 | 500 |
| Gasoline | GRO<br>8015 (modified) | 70<br>12 | 50-150<br>40-140 | 0-20<br>0-40 | 16<br>62 | 180<br>250 |
| Surrogate - Trifluorotoluene | 8015 | 2 | 67-137 | NA | NA | NA |
| Acetone | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 250 | 1000 |
| tert-Amyl alcohol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 130 | 1000 |
| sec-Butanol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 160 | 1000 |
| n-Butanol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 100 | 1000 |
| tert-Butanol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 160 | 1000 |
| 2-Butanone (MEK) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1300 | 5000 |
| n-Butyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 2300 | 5000 |
| sec-Butyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 2000 | 5000 |
| Butyl cellosolve | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1700 | 5000 |
| Cellosolve acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 3200 | 5000 |
| Cyclohexanone | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 2400 | 5000 |
| Diacetone alcohol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 2600 | 5000 |
| 1,4-Dioxane | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 250 | 1000 |
| Ethanol (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 130 | 1000 |
| Ethyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1400 | 5000 |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| 2-Hexanone | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1300 | 5000 |
| Methanol (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1000 | 1000 |
| n-Propanol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 220 | 1000 |
| Isopropanol (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 130 | 1000 |
| Diethylene glycol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1000 | 5000 |
| Ethylene glycol (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1900 | 5000 |
| Isoamyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 6400 | 5000 |
| Isobutanol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 130 | 1000 |
| Isobutyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1600 | 5000 |
| Isopropyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1900 | 5000 |
| Mesityl oxide | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 2300 | 5000 |
| Methyl acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 4100 | 5000 |
| 4-Methyl-2-pentanone (MIBK) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1300 | 5000 |
| 2-Nitropropane | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1200 | 5000 |
| n-Propyl acetate (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1500 | 5000 |
| Propylene glycol (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 590 | 5000 |
| Tetraethylene glycol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 4200 | 5000 |
| Tetrahydrofuran (MS) | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1100 | 5000 |
| Triethylene glycol | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 3300 | 5000 |
| Vinyl Acetate | 8015 (modified/DAI*) | 2 | 50-150 | 0-50 | 1300 | 5000 |

* DAI = Direct Extract Injection

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Benzene (MS) | 8020(5030) | 2 | 63-133 | 0-27 | 0.24 | 5.0 |
| Chlorobenzene (MS) | 8020(5030) | 2 | 69-129 | 0-25 | 0.63 | 5.0 |
| 1,2-Dichlorobenzene | 8020(5030) | 2 | 37-154 | 0-30 | 0.79 | 5.0 |
| 1,3-Dichlorobenzene | 8020(5030) | 2 | 50-141 | 0-30 | 0.57 | 5.0 |
| 1,4-Dichlorobenzene | 8020(5030) | 2 | 42-143 | 0-30 | 0.54 | 5.0 |
| Ethylbenzene | 8020(5030) | 2 | 32-160 | 0-30 | 0.53 | 5.0 |
| Methyl tert-butyl ether (MTBE) | 8020***(5030) | 2 | 50-150 | 0-30 | 23 | 50 |
| Toluene (MS) | 8020(5030) | 2 | 70-138 | 0-26 | 0.35 | 5.0 |
| Xylenes (total) | 8020(5030) | 2 | 50-150 | 0-30 | 1.1 | 5.0 |
| m-Xylene | 8020(5030) | 2 | 50-150 | 0-30 | 0.87 | 5.0 |
| o+p Xylene | 8020(5030) | 2 | 50-150 | 0-30 | 0.71 | 5.0 |
| Surrogate - a,a,a-Trifluorotoluene | 8020(5030) | 2 | 67-137 | NA | NA | NA |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Benzene (MS) | 8021 | 2 | 61-131 | 0-31 | 0.37 | 5.0 |
| Bromobenzene | 8021 | 2 | 46-195 | 0-56 | 2.5 | 5.0 |
| Bromochloromethane | 8021 | 2 | 34-128 | 0-52 | 1.4 | 5.0 |
| Bromodichloromethane | 8021 | 2 | 46-143 | 0-54 | 0.32 | 5.0 |
| Bromoform | 8021 | 2 | 31-131 | 0-40 | 0.51 | 25 |
| Bromomethane | 8021 | 2 | 25-167 | 0-78 | 1.7 | 5.0 |
| n-Butylbenzene | 8021 | 2 | 50-150 | 0-22 | 0.85 | 5.0 |
| sec-Butylbenzene | 8021 | 2 | 50-150 | 0-21 | 0.70 | 5.0 |
| tert-Butylbenzene | 8021 | 2 | 49-188 | 0-48 | 0.90 | 5.0 |
| Carbon tetrachloride | 8021 | 2 | 42-141 | 0-50 | 0.94 | 5.0 |
| Chlorobenzene (MS) | 8021 | 2 | 48-143 | 0-24 | 0.38 | 5.0 |
| Chloroethane | 8021 | 2 | 43-158 | 0-52 | 0.66 | 5.0 |
| Chloroform | 8021 | 2 | 53-134 | 0-36 | 1.1 | 5.0 |
| Chloromethane | 8021 | 2 | 40-172 | 0-53 | 0.94 | 5.0 |
| 2-Chlorotoluene | 8021 | 2 | 70-140 | 0-27 | 1.5 | 50 |
| 4-Chlorotoluene | 8021 | 2 | 77-136 | 0-27 | 1.4 | 50 |
| Dibromochloromethane | 8021 | 2 | 44-150 | 0-56 | 0.55 | 5.0 |
| 1,2-Dibromo-3-chloropropane | 8021 | 2 | 24-145 | 0-56 | 7.0 | 5.0 |
| 1,2-Dibromoethane | 8021 | 2 | 34-168 | 0-77 | 2.6 | 5.0 |
| Dibromomethane | 8021 | 2 | 41-147 | 0-59 | 2.6 | 5.0 |
| 1,2-Dichlorobenzene | 8021 | 2 | 52-141 | 10-39 | 0.64 | 5.0 |
| 1,3-Dichlorobenzene | 8021 | 2 | 68-123 | 0-28 | 0.63 | 5.0 |
| 1,4-Dichlorobenzene | 8021 | 2 | 65-131 | 0-42 | 0.65 | 5.0 |
| Dichlorodifluoromethane | 8021 | 2 | 49-196 | 0-50 | 1.0 | 5.0 |
| 1,1-Dichloroethane | 8021 | 2 | 61-137 | 0-36 | 0.72 | 5.0 |
| 1,2-Dichloroethane | 8021 | 2 | 38-148 | 0-58 | 1.3 | 5.0 |
| 1,1-Dichloroethene (MS) | 8021 | 2 | 48-155 | 0-35 | 0.92 | 5.0 |
| cis-1,2-Dichloroethene | 8021 | 2 | 40-138 | 0-39 | 0.84 | 5.0 |
| tans-1,2-Dichloroethene | 8021 | 2 | 64-139 | 0-43 | 0.93 | 5.0 |
| 1,2-Dichloropropane | 8021 | 2 | 53-129 | 0-45 | 0.68 | 5.0 |
| 1,3-Dichloropropane | 8021 | 2 | 53-150 | 0-57 | 5.5 | 5.0 |
| 2,2-Dichloropropane | 8021 | 2 | 40-138 | 0-39 | 2.4 | 5.0 |
| 1,1-Dichloropropene | 8021 | 2 | 42-141 | 0-50 | 3.1 | 5.0 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| cis-1,3-Dichloropropene | 8021 | 2 | 44-146 | 0-45 | 0.72 | 5.0 |
| trans-1,3-Dichloropropene | 8021 | 2 | 30-152 | 0-55 | 0.78 | 5.0 |
| Ethylbenzene | 8021 | 2 | 68-118 | 0-29 | 0.40 | 5.0 |
| Hexachlorobutadiene | 8021 | 2 | 52-145 | 0-41 | 1.8 | 5.0 |
| Isopropylbenzene | 8021 | 2 | 50-150 | 0-27 | 0.80 | 5.0 |
| p-Isopropyltoluene | 8021 | 2 | 50-150 | 0-24 | 1.0 | 5.0 |
| Methylene chloride | 8021 | 2 | 60-177 | 0-40 | 1.4 | 5.0 |
| Naphthalene | 8021 | 2 | 67-133 | 0-42 | 3.4 | 5.0 |
| n-Propylbenzene | 8021 | 2 | 50-150 | 0-19 | 0.75 | 5.0 |
| Styrene | 8021 | 2 | 81-108 | 0-18 | 2.0 | 5.0 |
| 1,1,1,2-Tetrachloroethane | 8021 | 2 | 62-141 | 0-41 | 0.83 | 5.0 |
| 1,1,2,2-Tetrachloroethane | 8021 | 2 | 61-148 | 0-48 | 16 | 5.0 |
| Tetrachloroethene | 8021 | 2 | 53-150 | 0-57 | 0.21 | 5.0 |
| Toluene (MS) | 8021 | 2 | 64-144 | 0-22 | 0.34 | 5.0 |
| 1,2,3-Trichlorobenzene | 8021 | 2 | 77-125 | 0-26 | 1.3 | 5.0 |
| 1,2,4-Trichlorobenzene | 8021 | 2 | 44-139 | 0-53 | 1.5 | 5.0 |
| 1,1,1-Trichloroethane | 8021 | 2 | 59-136 | 0-47 | 1.3 | 5.0 |
| 1,1,2-Trichloroethane | 8021 | 2 | 64-160 | 0-53 | 0.59 | 5.0 |
| Trichloroethene (MS) | 8021 | 2 | 51-140 | 0-48 | 0.52 | 5.0 |
| Trichlorofluoromethane | 8021 | 2 | 58-152 | 0-37 | 0.50 | 5.0 |
| 1,2,3-Trichloropropane | 8021 | 2 | 61-148 | 0-48 | 16 | 5.0 |
| 1,2,4-Trimethylbenzene | 8021 | 2 | 32-132 | 0-44 | 1.0 | 5.0 |
| 1,3,5-Trimethylbenzene | 8021 | 2 | 50-150 | 0-16 | 1.6 | 5.0 |
| Vinyl Chloride | 8021 | 2 | 44-173 | 0-61 | 0.94 | 5.0 |
| o-Xylene | 8021 | 2 | 50-150 | 0-18 | 0.40 | 5.0 |
| m&p-Xylene | 8021 | 2 | 62-138 | 0-49 | 0.42 | 5.0 |
| Surrogate - 2-Bromo-1-chloropropane | 8021 | 2 | 70-130 | NA | NA | NA |
| Surrogate - Fluorobenzene | 8021 | 2 | 70-130 | NA | NA | NA |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg)) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Acrolein | 8030(5030) | 2 | 88-118 | 0-30 | 25 | 100 |
| Acrylonitrile | 8030(5030) | 2 | 71-135 | 0-30 | 25 | 100 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| 2-Chlorophenol (MS) | 8040(3550) | 2 | 27-150 | 0-26 | 50 | 330 |
| 4-Chloro-3-methylphenol (MS) | 8040(3550) | 2 | 20-151 | 0-39 | 41 | 330 |
| 2,4-Dichlorophenol | 8040(3550) | 2 | 44-119 | 0-40 | 63 | 330 |
| 2,4-Dimethylphenol | 8040(3550) | 2 | 24-118 | 0-40 | 140 | 330 |
| 2,4-Dinitrophenol | 8040(3550) | 2 | 12-145 | 0-65 | 110 | 1700 |
| 2-Methyl-4,6-dinitrophenol | 8040(3550) | 2 | 30-136 | 0-40 | 50 | 1700 |
| 3 and 4-Methyl phenol (m & p cresol) | ***8040(3550) | 2 | 10-150 | 0-50 | 180 | 330 |
| 2-Methyl phenol (o-cresol) | ***8040(3550) | 2 | 10-150 | 0-50 | 92 | 330 |
| Cresols (total) | 8040(3550) | 2 | 10-150 | 0-50 | 82 | 330 |
| 2-Nitrophenol | 8040(3550) | 2 | 43-117 | 0-40 | 44 | 330 |
| 4-Nitrophenol (MS) | 8040(3550) | 2 | 10-130 | 0-34 | 60 | 1700 |
| Pentachlorophenol (MS) | 8040(3550) | 2 | 10-162 | 0-80 | 48 | 1700 |
| Phenol (MS) | 8040(3550) | 2 | 13-149 | 0-30 | 68 | 330 |
| Trichlorophenols (2,4,5 and 2,4,6) | 8040(3550) | 2 | NA | NA | 82 | 330 |
| 2,3,4,6-Tetrachlorophenol | ***8040(3550) | 2 | 50-150 | 0-40 | 160 | 660 |
| 2,3,4,5-Tetrachlorophenol | ***8040(3550) | 2 | 50-150 | 0-40 | 120 | 660 |
| Tetrachlorophenols (2,3,4,5 and 2,3,4,6) | 8040(3550) | 2 | NA | NA | 160 | 660 |
| 2,4,6-Trichlorophenol | 8040(3550) | 2 | 53-119 | 0-40 | 55 | 330 |
| 2,4,5-Trichlorophenol | ***8040(3550) | 2 | 53-119 | 0-40 | 100 | 330 |
| Surrogate - 2,4,6-Tribromophenol | 8040(3550) | 2 | 10-186 | NA | NA | NA |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Butyl benzyl phthalate (MS) | 8060(3550) | 2 | 10-137 | 0-66 | 32 | 330 |
| Bis(2-ethylhexyl) phthalate (MS) | 8060(3550) | 2 | 10-151 | 0-54 | 29 | 330 |
| Di-n-butyl phthalate (MS) | 8060(3550) | 2 | 14-123 | 0-41 | 28 | 330 |
| Diethyl phthalate (MS) | 8060(3550) | 2 | 10-145 | 0-34 | 31 | 330 |
| Dimethyl phthalate (MS) | 8060(3550) | 2 | 10-147 | 0-31 | 29 | 330 |
| Di-n-octyl phthalate (MS) | 8060(3550) | 2 | 10-147 | 0-86 | 31 | 330 |
| Surrogate - 2-Fluorobiphenyl | 8060(3550) | 2 | 17-164 | NA | NA | NA |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Aldrin (MS) | 8080(3550)<br>CLP 3/90 | 2<br>62 | 40-137<br>34-132 | 0-39<br>0-43 | 0.58<br>1.7 | 1.7<br>1.7 |
| Benfluralin | 8080***(3550) | 2 | 40-140 | 0-40 | 0.33 | 0.33 |
| alpha-BHC | 8080(3550)<br>CLP 3/90 | 2<br>62 | 37-134<br>NA | 0-40<br>NA | 0.19<br>1.7 | 1.7<br>1.7 |
| beta-BHC | 8080(3550)<br>CLP 3/90 | 2<br>62 | 17-147<br>NA | 0-40<br>NA | 0.24<br>1.7 | 1.7<br>1.7 |
| gamma-BHC (Lindane) (MS) | 8080(3550)<br>CLP 3/90 | 2<br>62 | 41-134<br>46-127 | 0-36<br>0-50 | 0.26<br>1.7 | 1.7<br>1.7 |
| delta-BHC | 8080(3550)<br>CLP 3/90 | 2<br>62 | 19-140<br>NA | 0-40<br>NA | 0.40<br>1.7 | 1.7<br>1.7 |
| technical Chlordane | 8080(3550) | 2 | 45-119 | 0-40 | 3.5 | 17 |
| alpha Chlordane | 8080(3550)<br>CLP 3/90 | 2<br>62 | 45-140<br>NA | 0-40<br>NA | 0.44<br>1.7 | 1.7<br>1.7 |
| gamma Chlordane | 8080(3550)<br>CLP 3/90 | 2<br>62 | 45-140<br>NA | 0-40<br>NA | 0.42<br>1.7 | 1.7<br>1.7 |
| Chlorobenzilate | 8081***V(3550) | 2 | 50-150 | 0-40 | 5.2 | 17 |
| Chloroneb | 8080***V(3550) | 2 | 49-125 | 0-30 | 3.2 | 13 |
| Chloropropylate | 8080***V(3550) | 2 | 51-125 | 0-30 | 4.0 | 16 |
| Chlorothalonil | 8080***(3550) | 2 | 35-130 | 0-40 | 1.7 | 6.7 |
| 4,4'-DDD | 8080(3550)<br>CLP 3/90 | 2<br>62 | 31-141<br>NA | 0-50<br>NA | 1.1<br>3.3 | 3.3<br>3.3 |
| 4,4'-DDE | 8080(3550)<br>CLP 3/90 | 2<br>62 | 30-145<br>NA | 0-50<br>NA | 0.29<br>3.3 | 3.3<br>3.3 |
| 4,4'-DDT (MS) | 8080(3550)<br>CLP 3/90 | 2<br>62 | 48-150<br>23-134 | 0-34<br>0-50 | 0.60<br>3.3 | 3.3<br>3.3 |
| Dicofol (Kelthane) | 8081***V(3550) | 2 | 40-125 | 0-40 | 1.7 | 20 |
| Dieldrin (MS) | 8080(3550)<br>CLP 3/90 | 2<br>62 | 42-139<br>31-134 | 0-41<br>0-38 | 0.35<br>3.3 | 3.3<br>3.3 |
| Endosulfan I | 8080(3550)<br>CLP 3/90 | 2<br>62 | 45-153<br>NA | 0-40<br>NA | 0.43<br>1.7 | 1.7<br>1.7 |
| Endosulfan II | 8080(3550)<br>CLP 3/90 | 2<br>62 | 10-202<br>NA | 0-65<br>NA | 2.8<br>3.3 | 3.3<br>3.3 |
| Endosulfan sulfate | 8080(3550)<br>CLP 3/90 | 2<br>62 | 26-144<br>NA | 0-50<br>NA | 0.76<br>3.3 | 3.3<br>3.3 |
| Endrin (MS) | 8080(3550)<br>CLP 3/90 | 2<br>62 | 44-151<br>42-139 | 0-31<br>0-45 | 0.30<br>3.3 | 3.3<br>3.3 |
| Endrin aldehyde | 8080(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 1.1<br>10 | 3.3<br>10 |
| Endrin ketone | CLP 3/90 | 62 | NA | NA | 3.3 | 3.3 |
| Etridiazole | 8080***V(3550) | 2 | 50-125 | 0-30 | 0.33 | 0.33 |
| Heptachlor (MS) | 8080(3550)<br>CLP 3/90 | 2<br>62 | 40-136<br>35-130 | 0-34<br>0-31 | 0.80<br>1.7 | 1.7<br>1.7 |
| Heptachlor epoxide | 8080(3550)<br>CLP 3/90 | 2<br>62 | 37-142<br>NA | 0-40<br>NA | 0.47<br>1.7 | 1.7<br>1.7 |
| Isodrin | 8081***V(3550) | 2 | 10-150 | 0-50 | 0.65 | 3.3 |
| Kepone | 8081***V(3550) | 2 | 10-150 | 0-50 | 4.2 | 17 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Methoxychlor | 8080(3550)<br>CLP 3/90 | 2<br>62 | 50-140<br>NA | 0-40<br>NA | 3.6<br>17 | 17<br>17 |
| Mirex | 8081***V(3550) | 2 | 20-100 | 0-50 | 8.2 | 33 |
| Pendimethalin | 8080***(3550) | 2 | 35-125 | 0-50 | 17 | 67 |
| Permethrin (total) | 8080***(3550) | 2 | 40-140 | 0-50 | 8.2 | 33 |
| Propachlor | 8080***V(3550) | 2 | 51-125 | 0-30 | 4.0 | 16 |
| Toxaphene | 8080(3550)<br>CLP 3/90 | 2<br>62 | 41-126<br>NA | 0-50<br>NA | 34<br>170 | 170<br>170 |
| Trifluralin | 8080***(3550) | 2 | 40-140 | 0-40 | 0.33 | 0.33 |
| PCB-1016 | 8080(3550)<br>CLP 3/90<br>EPA-600/4-81-045 | 2<br>62<br>61 | 69-107<br>NA<br>50-130 | 0-21<br>NA<br>0-50 | 4.6<br>33<br>1200 | 33<br>33<br>5000 |
| PCB 1221 | 8080(3550)<br>CLP 3/90<br>EPA-600/4-81-045 | 2<br>62<br>61 | 15-178<br>NA<br>50-130 | 0-20<br>NA<br>0-50 | 8.8<br>67<br>1200 | 67<br>67<br>5000 |
| PCB 1232 | 8080(3550)<br>CLP 3/90<br>EPA-600/4-81-045 | 2<br>62<br>61 | 10-215<br>NA<br>50-130 | 0-20<br>NA<br>0-50 | 13<br>33<br>1200 | 33<br>33<br>5000 |
| PCB-1242 | 8080(3550)<br>CLP 3/90<br>EPA-600/4-81-045 | 2<br>62<br>61 | 39-150<br>NA<br>50-130 | 0-20<br>NA<br>0-50 | 15<br>33<br>1200 | 33<br>33<br>5000 |
| PCB-1248 | 8080(3550)<br>CLP 3/90<br>EPA-600/4-81-045 | 2<br>62<br>61 | 38-158<br>NA<br>50-130 | 0-20<br>NA<br>0-50 | 5.0<br>33<br>1200 | 33<br>33<br>5000 |
| PCB-1254 | 8080(3550)<br>CLP 3/90<br>EPA-600/4-81-045 | 2<br>62<br>61 | 66-122<br>NA<br>50-130 | 0-23<br>NA<br>0-50 | 5.2<br>33<br>1200 | 33<br>33<br>5000 |
| PCB-1260 | 8080(3550)<br>CLP 3/90<br>EPA-600/4-81-045 | 2<br>62<br>61 | 58-122<br>NA<br>50-130 | 0-20<br>NA<br>0-50 | 13<br>33<br>1200 | 33<br>33<br>5000 |
| Surrogate - Dibutylchlorendate (DBC) | 8080(3550) | 2 | 45-131 | NA | NA | NA |
| Surrogate - 2,4,5,6-Tetrachloro-m-xylene (TCMX) | 8080(3550)<br>CLP 3/90 | 2<br>62 | 19-132<br>60-150 | NA<br>NA | NA<br>NA | NA<br>NA |
| Surrogate - Decachlorobiphenyl (DCB) | 8080(3550)<br>CLP 3/90 | 2<br>62 | 47-126<br>60-150 | NA<br>NA | NA<br>NA | NA<br>NA |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| 2,4-Dinitrotoluene (MS) | 8090(3550)(FID)<br>8090(3550)(ECD) | 2<br>2 | 10-125<br>10-125 | 0-40<br>0-40 | 82<br>0.56 | 330<br>10 |
| 2,6-Dinitrotoluene (MS) | 8090(3550)(FID)<br>8090(3550)(ECD) | 2<br>2 | 10-126<br>10-126 | 0-40<br>0-40 | 82<br>0.65 | 330<br>10 |
| Isophorone (MS) | 8090(3550) | 2 | 10-117 | 0-40 | 82 | 330 |
| Nitrobenzene (MS) | 8090(3550) | 2 | 10-118 | 0-40 | 82 | 330 |
| Surrogate - 2-Fluorobiphenyl | 8090(3550)(FID) | 2 | 17-164 | NA | NA | NA |
| Surrogate - 2,4,5,6-Tetrachloro-m-xylene (TCMX) | 8090(3550)(ECD) | 2 | 19-132 | NA | NA | NA |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Acenaphthene (MS) | 8100(3550) | 2 | 37-115 | 0-32 | 10 | 330 |
| Acenaphthylene | 8100(3550) | 2 | 36-114 | 0-32 | 16 | 330 |
| Benzo(a)pyrene (MS) | 8100(3550) | 2 | 21-125 | 0-45 | 51 | 330 |
| Benzo(b+k)fluoranthene | 8100(3550) | 2 | 26-128 | 0-41 | 82 | 330 |
| Benzo(g,h,i)perylene | 8100(3550) | 2 | 25-126 | 0-42 | 70 | 330 |
| Chrysene+Benzo(a)anthracene | 8100(3550) | 2 | 30-127 | 0-42 | 82 | 330 |
| Fluoranthene | 8100(3550) | 2 | 28-132 | 0-33 | 32 | 330 |
| Fluorene (MS) | 8100(3550) | 2 | 36-117 | 0-33 | 89 | 330 |
| Indeno(1,2,3-cd)Pyrene + Dibenzo(a,h)anthracene | 8100(3550) | 2 | 20-131 | 0-47 | 13 | 330 |
| 1-Methylnaphthalene | 8100(3550) | 2 | 20-140 | 0-50 | 12 | 330 |
| 2-Methylnaphthalene | 8100(3550) | 2 | 20-140 | 0-50 | 12 | 330 |
| Napthalene (MS) | 8100(3550) | 2 | 29-111 | 0-45 | 15 | 330 |
| Phenanthrene + Anthracene | 8100(3550) | 2 | 38-118 | 0-32 | 82 | 330 |
| Pyrene (MS) | 8100(3550) | 2 | 35-123 | 0-32 | 21 | 330 |
| Diesel (MS) | DRO<br>8100<br>(modified) | 69<br>12 | 40-140<br>40-140 | 0-40<br>0-40 | 800<br>2500 | 3300<br>10000 |
| Mineral spirits | 8100<br>(modified) | 12 | 40-140 | 0-40 | 2500 | 10000 |
| Surrogate - 2-Fluorobiphenyl | 8100(3550) | 2 | 17-164 | NA | NA | NA |
| Surrogate - o-Terphenyl | DRO<br>8100<br>(modified)<br>(3550) | 69<br>12 | 50-150<br>33-127 | NA<br>NA | NA<br>NA | NA<br>NA |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Acephate | 8141***(3550) | 2 | 40-140 | 0-50 | 42 | 167 |
| Alachlor | 8141***(3550) | 2 | 40-140 | 0-30 | 8.2 | 33 |
| Ametryn | 8141***V(3550) | 2 | 40-140 | 0-50 | 16 | 66 |
| Atrazine | 8141***V(3550) | 2 | 40-125 | 0-30 | 16 | 66 |
| Azinphos methyl | 8141(3550) | 2 | 16-129 | 0-50 | 1.9 | 66 |
| Bolstar | 8141(3550) | 2 | 58-156 | 0-40 | 8.2 | 33 |
| Bromacil | 8141***(3550) | 2 | 40-140 | 0-50 | 16 | 66 |
| Butylate | 8141***(3550) | 2 | 38-145 | 0-76 | 16 | 66 |
| Carbophenothion | 8141***V(3550) | 2 | 20-150 | 0-40 | 16 | 66 |
| Chlorpyrifos | 8141(3550) | 2 | 7-199 | 0-40 | 1.6 | 33 |
| Cyanazine | 8141***(3550) | 2 | 40-125 | 0-30 | 2.2 | 33 |
| Coumaphos | 8141(3550) | 2 | 51-147 | 0-40 | 9.8 | 330 |
| Cycloate | 8141***(3550) | 2 | 46-159 | 0-47 | 16 | 66 |
| Demeton-O | 8141(3550) | 2 | 36-120 | 0-40 | 21 | 83 |
| Demeton-S | 8141(3550) | 2 | 36-120 | 0-40 | 21 | 83 |
| Diazinon (MS) | 8141(3550) | 2 | 36-124 | 0-30 | 2.9 | 33 |
| Dichlofenthion | 8141***V(3550) | 2 | 40-140 | 0-50 | 8.2 | 33 |
| Dichlorvos | 8141(3550) | 2 | 49-120 | 0-40 | 6.4 | 66 |
| Dimethoate | 8141(3550) | 2 | 38-120 | 0-40 | 12 | 330 |
| Disulfoton | 8141(3550) | 2 | 10-134 | 0-93 | 5.4 | 66 |
| Dioxathion | 8141***V(3550) | 2 | 40-140 | 0-50 | 82 | 330 |
| EPN | 8141(3550) | 2 | 48-124 | 0-30 | 1.3 | 33 |
| EPTC | 8141***(3550) | 2 | 46-154 | 0-55 | 16 | 66 |
| Ethion | 8141(3550) | 2 | 40-138 | 0-40 | 4.2 | 17 |
| Ethoprop | 8141(3550) | 2 | 58-113 | 0-40 | 0.61 | 17 |
| Famphur | 8141(3550) | 2 | 10-129 | 0-60 | 42 | 66 |
| Fenamiphos | 8141***(3550) | 2 | 40-160 | 0-40 | 4.2 | 17 |
| Fensulfothion | 8141(3550) | 2 | 43-145 | 0-40 | 2.8 | 330 |
| Fenthion | 8141(3550) | 2 | 10-128 | 0-60 | 2.8 | 33 |
| Fonofos | 8141***(3550) | 2 | 40-160 | 0-40 | 8.2 | 33 |
| Hexazinone | 8141***(3550) | 2 | 40-140 | 0-50 | 8.2 | 33 |
| Isofenphos | 8141***(3550) | 2 | 40-160 | 0-40 | 4.2 | 17 |
| Malathion | 8141(3550) | 2 | 60-140 | 0-40 | 13 | 33 |
| Merphos | 8141(3550) | 2 | 50-130 | 0-40 | 1.5 | 33 |
| Metalaxyl | 8141***(3550) | 2 | 40-140 | 0-50 | 8.2 | 33 |
| Methamidophos | 8141***(3550) | 2 | 40-140 | 0-50 | 16 | 66 |
| Methyl chlorpyrifos | 8141***(3550) | 2 | 40-140 | 0-50 | 8.2 | 33 |
| Metolachlor | 8141***(3550) | 2 | 40-140 | 0-50 | 8.2 | 33 |
| Metribuzin | 8141***(3550) | 2 | 40-140 | 0-50 | 8.2 | 33 |
| Mevinphos | 8141(3550) | 2 | 34-125 | 0-40 | 2.1 | 66 |
| Molinate | 8141***(3550) | 2 | 37-127 | 0-74 | 16 | 66 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Monocrotophos | 8141***(3550) | 2 | 40-140 | 0-50 | 82 | 330 |
| Naled | 8141(3550) | 2 | 54-102 | 0-40 | 6.9 | 330 |
| Norflurazon | 8141***(3550) | 2 | 40-140 | 0-50 | 8.2 | 33 |
| Parathion, ethyl (MS) | 8141(3550) | 2 | 15-141 | 0-79 | 8.2 | 33 |
| Parathion, methyl (MS) | 8141(3550) | 2 | 40-140 | 0-40 | 4.2 | 17 |
| Pebulate | 8141***(3550) | 2 | 22-172 | 0-50 | 8.2 | 33 |
| Phorate | 8141(3550) | 2 | 36-125 | 0-40 | 8.2 | 33 |
| Prometon | 8141***V(3550) | 2 | 40-140 | 0-50 | 16 | 66 |
| Prometryn | 8141***V(3550) | 2 | 40-140 | 0-50 | 16 | 66 |
| Propazine | 8141***V(3550) | 2 | 40-140 | 0-50 | 16 | 66 |
| Ronnel (MS) | 8141(3550) | 2 | 22-127 | 0-35 | 23 | 33 |
| Simazine | 8141***V(3550) | 2 | 20-150 | 0-50 | 16 | 66 |
| Stirophos (Tetrachlorvinphos) | 8141(3550) | 2 | 48-125 | 0-40 | 8.2 | 33 |
| Sulfotepp (MS) | 8141(3550) | 2 | 13-171 | 0-65 | 4.2 | 17 |
| Terbufos | 8141***(3550) | 2 | 40-140 | 0-50 | 4.2 | 17 |
| Terbutryn | 8141***V(3550) | 2 | 40-140 | 0-50 | 82 | 330 |
| Terbutylazine | 8141***V(3550) | 2 | 40-140 | 0-50 | 16 | 66 |
| Thionazin (MS) | 8141(3550) | 2 | 25-160 | 0-60 | 16 | 33 |
| Tokuthion (Prothiofos) | 8141(3550) | 2 | 44-125 | 0-40 | 8.2 | 33 |
| Triadimefon | 8141***(3550) | 2 | 40-140 | 0-50 | 8.2 | 33 |
| Trichloronate | 8141(3550) | 2 | 49-161 | 0-40 | 82 | 330 |
| Vernolate | 8141***(3550) | 2 | 39-147 | 0-45 | 16 | 66 |
| Surrogate - Triphenylphosphate | 8141(3550) | 2 | 40-125 | NA | NA | NA |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| 2,4-D (MS) | 8150 | 2 | 10-130 | 0-47 | 1.3 | 8.3 |
| Dalapon | 8150 | 2 | 10-170 | 0-40 | 16 | 2000 |
| 2,4-DB | 8150 | 2 | 20-160 | 0-40 | 0.74 | 8.3 |
| Dicamba | 8150 | 2 | 20-160 | 0-40 | 0.54 | 20 |
| Dichlorprop | 8150 | 2 | 30-170 | 0-40 | 1.8 | 100 |
| Dinoseb | 8150 | 2 | 30-170 | 0-40 | 0.92 | 100 |
| MCPA | 8150 | 2 | 30-170 | 0-40 | 350 | 2000 |
| MCPP | 8150 | 2 | 30-170 | 0-40 | 280 | 2000 |
| Pentachlorophenol | 8151 | 2 | 10-150 | 0-40 | 4.3 | 17 |
| Picloram | 8150*** | 2 | 10-150 | 0-40 | 1.6 | 3.3 |
| 2,4,5-T (MS) | 8150 | 2 | 24-115 | 0-46 | 0.22 | 8.3 |
| 2,4,5-TP (Silvex) (MS) | 8150 | 2 | 10-150 | 0-54 | 0.18 | 8.3 |
| Surrogate - 2,4-Dichlorophenoxy butanoic acid (2,4-DB) | 8150 | 2 | 20-160 | NA | NA | NA |
| Surrogate - 2,4-Dichlorophenyl acetic acid (DCAA) | 8150 | 2 | 10-148 | NA | NA | NA |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Acetone | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 29-92<br>NA | 0-40<br>NA | 3.0<br>10 | 25<br>10 |
| Acetonitrile | 8240(5030) | 2 | 78-151 | 0-40 | 21 | 1000 |
| Acrolein | 8240(5030)/8260(5030) | 2 | 22-164 | 0-65 | 21 | 100 |
| Acrylonitrile | 8240(5030)/8260(5030) | 2 | 61-145 | 0-40 | 12 | 100 |
| Benzene (MS) | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 48-150<br>66-142 | 0-27<br>0-21 | 0.34<br>10 | 5.0<br>10 |
| Benzyl Chloride | 8240(5030)/8260(5030) | 2 | 50-150 | 0-40 | 25 | 100 |
| Bromobenzene | 8260(5030) | 2 | 50-150 | 0-40 | 2.5 | 10 |
| Bromochloromethane | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| Bromodichloromethane | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 35-155<br>NA | 0-40<br>NA | 0.29<br>10 | 5.0<br>10 |
| Bromoform | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 45-169<br>NA | 0-40<br>NA | 0.48<br>10 | 5.0<br>10 |
| Bromomethane (Methyl bromide) | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 10-242<br>NA | 0-65<br>NA | 1.3<br>10 | 10<br>10 |
| 2-Butanone (MEK) | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 10-111<br>NA | 0-40<br>NA | 6.1<br>10 | 25<br>10 |
| n-Butylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| sec-Butylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| tert-Butylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| Carbon disulfide | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 35-244<br>NA | 0-65<br>NA | 0.98<br>10 | 5.0<br>10 |
| Carbon tetrachloride | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 70-140<br>NA | 0-40<br>NA | 0.85<br>10 | 5.0<br>10 |
| Chlorobenzene (MS) | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 54-138<br>60-133 | 0-33<br>0-21 | 0.32<br>10 | 5.0<br>10 |
| 2-Chloro-1,3-butadiene (Chloroprene) | 8240(5030)/8260(5030) | 2 | 28-256 | 0-65 | 4.0 | 5.0 |
| Chloroethane | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 44-136<br>NA | 0-40<br>NA | 3.5<br>10 | 10<br>10 |
| 2-Chloroethyl vinyl ether | 8240(5030)/8260(5030) | 2 | 10-305 | 0-65 | 1.7 | 50 |
| Chloroform | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 51-138<br>NA | 0-40<br>NA | 0.53<br>10 | 5.0<br>10 |
| Chloromethane | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 10-273<br>NA | 0-65<br>NA | 2.1<br>10 | 10<br>10 |
| 3-Chloropropene (Allyl chloride) | 8240(5030)/8260(5030) | 2 | 88-127 | 0-40 | 0.46 | 5.0 |
| 2-Chlorotoluene | 8260(5030) | 2 | 48-125 | 0-40 | 1.2 | 5.0 |
| 4-Chlorotoluene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| Dibromochloromethane | 8240/8260(5030)<br>CLP 3/90 | 2<br>62 | 53-149<br>NA | 0-40<br>NA | 0.80<br>10 | 5.0<br>10 |
| 1,2-Dibromo-3-chloropropane (DBCP) | 8240(5030)/8260(5030) | 2 | 26-165 | 0-40 | 6.5 | 10 |
| 1,2-Dibromoethane (EDB) | 8240(5030)/8260(5030) | 2 | 86-153 | 0-40 | 2.9 | 5.0 |
| Dibromomethane | 8240(5030)/8260(5030) | 2 | 50-150 | 0-40 | 0.36 | 5.0 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| 1,2-Dichlorobenzene | 8240(5030)/8260(5030) | 2 | 81-113 | 0-40 | 0.37 | 5.0 |
| 1,3-Dichlorobenzene | 8240(5030)/8260(5030) | 2 | 63-130 | 0-40 | 0.79 | 5.0 |
| 1,4-Dichlorobenzene | 8240(5030)/8260(5030) | 2 | 69-126 | 0-40 | 0.67 | 5.0 |
| trans-1,4-Dichloro-2-butene | 8240(5030) | 2 | 79-178 | 0-40 | 1.2 | 10 |
| Dichlorodifluoromethane | 8240(5030)/8260(5030) | 2 | 50-150 | 0-40 | 0.41 | 5.0 |
| 1,1-Dichloroethane | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 59-155<br>NA | 0-40<br>NA | 0.66<br>10 | 5.0<br>10 |
| 1,2-Dichloroethane | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 49-155<br>NA | 0-40<br>NA | 0.59<br>10 | 5.0<br>10 |
| cis/trans-1,2-Dichloroethene | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 54-156<br>NA | 0-40<br>NA | 0.63<br>10 | 5.0<br>10 |
| 1,1-Dichloroethene (MS) | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 36-161<br>59-172 | 0-50<br>0-22 | 0.88<br>10 | 5.0<br>10 |
| 1,2-Dichloropropane | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 10-210<br>NA | 0-65<br>NA | 0.96<br>10 | 5.0<br>10 |
| 1,3-Dichloropropane | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| 2,2-Dichloropropane | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| 1,1-Dichloropropene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| cis-1,3-Dichloropropene | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 10-227<br>NA | 0-65<br>NA | 0.50<br>10 | 5.0<br>10 |
| trans-1,3-Dichloropropene | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 17-183<br>NA | 0-65<br>NA | 0.31<br>10 | 5.0<br>10 |
| Diethyl ether | 8240***(5030) | 2 | 50-150 | 0-40 | 2.5 | 10 |
| Ethanol | 8240(5030) | 2 | 40-160 | 0-40 | 250 | 1000 |
| Ethylbenzene | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 37-162<br>NA | 0-40<br>NA | 0.50<br>10 | 5.0<br>10 |
| Ethyl methacrylate | 8240(5030) | 2 | 47-87 | 0-40 | 1.9 | 5.0 |
| Hexachlorobutadiene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| 2-Hexanone | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 22-86<br>NA | 0-40<br>NA | 3.0<br>10 | 25<br>10 |
| Iodomethane | 8240(5030)/8260(5030) | 2 | 77-105 | 0-40 | 0.33 | 5.0 |
| Isobutyl alcohol | 8240(5030) | 2 | 63-173 | 0-40 | 690 | 1000 |
| Isopropylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| p-Isopropyltoluene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| Methacrylonitrile | 8240(5030) | 2 | 69-145 | 0-60 | 25 | 100 |
| Methylene chloride | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 10-221<br>NA | 0-65<br>NA | 0.77<br>10 | 5.0<br>10 |
| Methyl methacrylate | 8240(5030) | 2 | 32-118 | 0-45 | 4.0 | 5.0 |
| 4-Methyl-2-pentanone (MIBK) | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 64-125<br>NA | 0-49<br>NA | 2.9<br>10 | 25<br>10 |
| Methyl t-butyl ether (MTBE) | 8240***(5030) | 2 | 40-150 | 0-40 | 9.5 | 10 |
| Naphthalene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| Pentachloroethane | 8240(5030) | 2 | 41-165 | 0-50 | 7.0 | 25 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Propionitrile (ethylcyanide) | 8240(5030) | 2 | 73-227 | 0-65 | 24 | 100 |
| n-Propylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| Styrene | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 89-101<br>NA | 0-40<br>NA | 0.14<br>10 | 5.0<br>10 |
| 1,1,1,2-Tetrachloroethane | 8240(5030)/8260(5030) | 2 | 50-150 | 0-40 | 1.4 | 5.0 |
| 1,1,2,2-Tetrachloroethane | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 46-157<br>NA | 0-40<br>NA | 1.8<br>10 | 5.0<br>10 |
| Tetrachloroethene | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 64-148<br>NA | 0-40<br>NA | 0.39<br>10 | 5.0<br>10 |
| Toluene (MS) | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 51-141<br>59-139 | 0-27<br>0-21 | 0.42<br>10 | 5.0<br>10 |
| 1,2,3-Trichlorobenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| 1,2,4-Trichlorobenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| 1,1,1-Trichloroethane | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 52-162<br>NA | 0-40<br>NA | 0.69<br>10 | 5.0<br>10 |
| 1,1,2-Trichloroethane | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 52-150<br>NA | 0-40<br>NA | 0.26<br>10 | 5.0<br>10 |
| Trichloroethene (MS) | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 43-140<br>62-137 | 0-27<br>0-24 | 1.5<br>10 | 5.0<br>10 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 8240(5030)/8260(5030) | 2 | 17-181 | 0-65 | 0.72 | 5.0 |
| 1,2,3-Trichloropropane | 8240(5030)/8260(5030) | 2 | 43-105 | 0-40 | 2.9 | 5.0 |
| Trichlorotrifluoroethane | 8240***(5030) | 2 | 60-140 | 0-40 | 0.71 | 5.0 |
| 1,2,4-Trimethylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| 1,3,5-Trimethylbenzene | 8260(5030) | 2 | 50-150 | 0-40 | 1.2 | 5.0 |
| Vinyl acetate | 8240(5030)/8260(5030) | 2 | 50-150 | 0-40 | 0.62 | 10 |
| Vinyl chloride | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 10-251<br>NA | 0-65<br>NA | 3.9<br>10 | 10<br>10 |
| Xylenes (total) | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 50-150<br>NA | 0-40<br>NA | 0.14<br>10 | 5.0<br>10 |
| Surrogate - Toluene-d8 | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 68-123<br>84-138 | NA<br>NA | NA<br>NA | NA<br>NA |
| Surrogate - p-Bromofluorobenzene | 8240(5030)/8260(5030)<br>CLP 3/90 | 2<br>62 | 64-126<br>59-113 | NA<br>NA | NA<br>NA | NA<br>NA |
| Surrogate - Dibromofluoromethane | 8260(5030) | 2 | 80-120 | NA | NA | NA |
| Surrogate - 1,2-Dichloroethane-d4 | 8240(5030)<br>CLP 3/90 | 2<br>62 | 46-143<br>70-121 | NA<br>NA | NA<br>NA | NA<br>NA |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Acenaphthene (MS) | 8270(3550)<br>CLP 3/90 | 2<br>62 | 51-108<br>31-137 | 0-26<br>0-19 | 28<br>330 | 330<br>330 |
| Acenaphthylene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 54-140<br>NA | 0-24<br>NA | 31<br>330 | 330<br>330 |
| Acetophenone | 8270(3550) | 2 | 10-150 | 0-50 | 14 | 330 |
| 2-Acetylaminofluorene | 8270(3550) | 2 | 25-150 | 0-50 | 17 | 330 |
| Aldrin | 8270(3550) | 2 | 10-166 | 0-40 | 31 | 330 |
| 4-Aminobiphenyl | 8270(3550) | 2 | 10-150 | 0-50 | 7.8 | 330 |
| Aniline | 8270(3550) | 2 | 10-150 | 0-50 | 42 | 330 |
| Anthracene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 48-130<br>NA | 0-30<br>NA | 11<br>330 | 330<br>330 |
| Aramite | 8270(3550) | 2 | 40-150 | 0-50 | 18 | 330 |
| Benzidine | 8270(3550) | 2 | 10-200 | 0-100 | 675 | 2700 |
| Benzo(a)anthracene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 42-143<br>NA | 0-25<br>NA | 8.9<br>330 | 330<br>330 |
| Benzoic acid | 8270(3550) | 2 | 10-150 | 0-50 | 81 | 1700 |
| Benzo(b)fluoranthene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 49-123<br>NA | 0-25<br>NA | 19<br>330 | 330<br>330 |
| Benzo(k)fluoranthene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 24-137<br>NA | 0-38<br>NA | 17<br>330 | 330<br>330 |
| Benzo(g,h,i)perylene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-219<br>NA | 0-50<br>NA | 14<br>330 | 330<br>330 |
| Benzo(a)pyrene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 44-141<br>NA | 0-29<br>NA | 13<br>330 | 330<br>330 |
| Benzyl alcohol | 8270(3550) | 2/6 | 10-150 | 0-50 | 59 | 330 |
| Benzyl chloride | 8270(3550) | 2 | 10-150 | 0-50 | 82 | 330 |
| alpha-BHC | 8270(3550) | 2 | 10-150 | 0-50 | 35 | 330 |
| beta-BHC | 8270(3550) | 2 | 24-149 | 0-40 | 41 | 330 |
| delta-BHC | 8270(3550) | 2 | 10-110 | 0-40 | 6.9 | 330 |
| gamma-BHC | 8270(3550) | 2 | 10-150 | 0-50 | 27 | 330 |
| Bis(2-chloroethoxy) methane | 8270(3550)<br>CLP 3/90 | 2<br>62 | 33-184<br>NA | 0-50<br>NA | 38<br>330 | 330<br>330 |
| Bis(2-chloroethyl) ether | 8270(3550)<br>CLP 3/90 | 2<br>62 | 12-158<br>NA | 0-50<br>NA | 40<br>330 | 330<br>330 |
| Bis(2-chloroisopropyl) ether | 8270(3550)<br>CLP 3/90 | 2<br>62 | 36-166<br>NA | 0-50<br>NA | 54<br>330 | 330<br>330 |
| Bis(2-ethylhexyl) phthalate | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-158<br>NA | 0-40<br>NA | 27<br>330 | 330<br>330 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| 4-Bromophenyl phenyl ether | 8270(3550)<br>CLP 3/90 | 2<br>62 | 53-127<br>NA | 0-40<br>NA | 16<br>330 | 330<br>330 |
| Butyl benzyl phthalate | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-152<br>NA | 0-40<br>NA | 26<br>330 | 330<br>330 |
| Carbazole | 8270***(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 28<br>330 | 330<br>330 |
| Technical Chlordane | 8270(3550) | 2 | 10-150 | 0-50 | 420 | 1700 |
| p-Chloroaniline | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 32<br>330 | 660<br>330 |
| 4-Chloro-3-methylphenol (MS)<br>(p-Chloro-m-cresol) | 8270(3550)<br>CLP 3/90 | 2<br>62 | 38-112<br>26-103 | 0-23<br>0-33 | 42<br>330 | 330<br>330 |
| 1-Chloronaphthalene | 8270(3550) | 2 | 10-150 | 0-50 | 82 | 330 |
| 2-Chloronaphthalene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 60-118<br>NA | 0-40<br>NA | 26<br>330 | 330<br>330 |
| 2-Chlorophenol (MS) | 8270(3550)<br>CLP 3/90 | 2<br>62 | 45-105<br>25-102 | 0-31<br>0-50 | 38<br>330 | 330<br>330 |
| 4-Chlorophenylphenyl ether | 8270(3550)<br>CLP 3/90 | 2<br>62 | 25-158<br>NA | 0-33<br>NA | 25<br>330 | 330<br>330 |
| Chrysene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 40-148<br>NA | 0-27<br>NA | 14<br>330 | 330<br>330 |
| m&p-Creson | 8270(3550) | 2 | 10-150 | 0-50 | 20 | 330 |
| o-Cresol | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 60<br>330 | 330<br>330 |
| p-Cresol | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 67<br>330 | 330<br>330 |
| 4,4'-DDD | 8270(3550) | 2 | 10-145 | 0-40 | 34 | 330 |
| 4,4'-DDE | 8270(3550) | 2 | 10-136 | 0-40 | 31 | 330 |
| 4,4'-DDT | 8270(3550) | 2 | 10-203 | 0-62 | 57 | 330 |
| Diallate | 8270(3550) | 2 | 10-150 | 0-50 | 15 | 330 |
| Dibenz(a,h)anthracene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 40-147<br>NA | 0-28<br>NA | 12<br>330 | 330<br>330 |
| Dibenzofuran | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 30<br>330 | 330<br>330 |
| Di-n-butylphthalate | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-118<br>NA | 0-50<br>NA | 27<br>330 | 330<br>330 |
| 1,2-Dichlorobenzene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 32-129<br>NA | 0-40<br>NA | 36<br>330 | 330<br>330 |
| 1,3-Dichlorobenzene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-172<br>NA | 0-42<br>NA | 29<br>330 | 330<br>330 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene (MS) | 8270(3550)<br>CLP 3/90 | 2<br>62 | 46-112<br>28-104 | 0-28<br>0-27 | 29<br>330 | 330<br>330 |
| 3,3'-Dichlorobenzidine | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-262<br>NA | 0-100<br>NA | 480<br>330 | 660<br>330 |
| 2,4-Dichlorophenol | 8270(3550)<br>CLP 3/90 | 2<br>62 | 39-135<br>NA | 0-40<br>NA | 40<br>330 | 330<br>330 |
| 2,6-Dichlorophenol | 8270(3550) | 2 | 10-150 | 0-50 | 13 | 330 |
| Dieldrin | 8270(3550) | 2 | 29-136 | 0-40 | 39 | 330 |
| Diethylphthalate | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-114<br>NA | 0-40<br>NA | 21<br>330 | 330<br>330 |
| p-(Dimethylamino)azobenzene | 8270(3550) | 2 | 10-150 | 0-50 | 23 | 330 |
| 7,12-Dimethylbenz(a)anthracene | 8270(3550) | 2 | 10-150 | 0-50 | 9.9 | 330 |
| 3,3'-Dimethylbenzidine | 8270(3550) | 2 | 10-200 | 0-100 | 110 | 1700 |
| a,a-Dimethylphenethylamine | 8270(3550) | 2 | 10-150 | 0-50 | 600 | 1700 |
| 2,4-Dimethylphenol | 8270(3550)<br>CLP 3/90 | 2<br>62 | 15-151<br>NA | 0-22<br>NA | 35<br>330 | 330<br>330 |
| Dimethylphthalate | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-112<br>NA | 0-40<br>NA | 24<br>330 | 330<br>330 |
| m-Dinitrobenzene | 8270(3550) | 2 | 10-150 | 0-50 | 15 | 330 |
| 4,6-Dinitro-2-methylphenol | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-181<br>NA | 0-93<br>NA | 27<br>800 | 1700<br>800 |
| 2,4-Dinitrophenol | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-167<br>NA | 0-87<br>NA | 500<br>800 | 1700<br>800 |
| 2,4-Dinitrotoluene (MS) | 8270(3550)<br>CLP 3/90 | 2<br>62 | 35-111<br>28-89 | 0-29<br>0-47 | 20<br>330 | 330<br>330 |
| 2,6-Dinitrotoluene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 50-158<br>NA | 0-40<br>NA | 22<br>330 | 330<br>330 |
| Dinoseb (2-sec-Butyl-4,6-dinitrophenol) | 8270(3550) | 2 | 10-150 | 0-50 | 29 | 330 |
| Di-n-octylphthalate | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-146<br>NA | 0-50<br>NA | 16<br>330 | 330<br>330 |
| 1,4-Dioxane | 8270***V(3550) | 2 | 10-150 | 0-50 | 24 | 330 |
| Diphenylamine/<br>N-nitrosodiphenylamine | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 18<br>330 | 330<br>330 |
| 1,2-Diphenyl hydrazine | 8270(3550) | 2 | 10-150 | 0-50 | 24 | 330 |
| Endosulfan I | 8270(3550) | 2 | 10-150 | 0-50 | 33 | 660 |
| Endosulfan II | 8270(3550) | 2 | 10-150 | 0-50 | 19 | 660 |
| Endosulfan sulfate | 8270(3550) | 2 | 10-107 | 0-50 | 40 | 660 |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Endrin | 8270(3550) | 2 | 10-150 | 0-50 | 75 | 660 |
| Endrin aldehyde | 8270(3550) | 2 | 10-209 | 0-50 | 72 | 1700 |
| Endrin ketone | 8270/(3550) | 2 | 10-150 | 0-50 | 420 | 1700 |
| Ethyl methanesulfonate | 8270(3550) | 2 | 10-150 | 0-50 | 11 | 330 |
| Fluoranthene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 54-135<br>NA | 0-21<br>NA | 9.7<br>330 | 330<br>330 |
| Fluorene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 59-121<br>NA | 0-40<br>NA | 19<br>330 | 330<br>330 |
| Heptachlor | 8270(3550) | 2 | 10-192 | 0-40 | 39 | 660 |
| Heptachlor epoxide | 8270(3550) | 2 | 26-155 | 0-55 | 36 | 660 |
| Hexachlorobenzene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-152<br>NA | 0-40<br>NA | 20<br>330 | 330<br>330 |
| Hexachlorobutadiene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 24-116<br>NA | 0-40<br>NA | 20<br>330 | 330<br>330 |
| Hexachlorocyclopentadiene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 26<br>330 | 330<br>330 |
| Hexachloroethane | 8270(3550)<br>CLP 3/90 | 2<br>62 | 40-113<br>NA | 0-40<br>NA | 27<br>330 | 330<br>330 |
| Hexachlorophene[1] | 8270(3550) | 2 | 10-200 | 0-80 | 42000 | 170000 |
| Hexachloropropene | 8270(3550) | 2 | 10-150 | 0-50 | 28 | 330 |
| Indeno(1,2,3-cd)pyrene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 18-157<br>NA | 0-83<br>NA | 10<br>330 | 330<br>330 |
| Isophorone | 8270(3550)<br>CLP 3/90 | 2<br>62 | 21-196<br>NA | 0-60<br>NA | 51<br>330 | 330<br>330 |
| Isosafrole | 8270(3550) | 2 | 10-150 | 0-50 | 15 | 330 |
| Kepone | 8270(3550) | 2 | 10-150 | 0-50 | 80 | 330 |
| Methapyrilene | 8270(3550) | 2 | 10-150 | 0-50 | 890 | 3330 |
| 3-Methylcholanthrene | 8270(3550) | 2 | 10-150 | 0-50 | 7.6 | 330 |
| Methyl methanesulfonate | 8270(3550) | 2 | 10-150 | 0-50 | 19 | 330 |
| 1-Methylnaphthalene | 8270(3550) | 2 | 10-150 | 0-50 | 82 | 330 |
| 2-Methylnaphthalene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 28<br>330 | 330<br>330 |
| Naphthalene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 53-125<br>NA | 0-21<br>NA | 28<br>330 | 330<br>330 |
| 1,4-Napthoquinone | 8270(3550) | 2 | 10-150 | 0-50 | 24 | 330 |

[1] Exhibits non-reproducible chromatographic behavior.

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| 1-Napthylamine | 8270(3550) | 2 | 10-150 | 0-50 | 12 | 330 |
| 2-Napthylamine | 8270(3550) | 2 | 10-150 | 0-50 | 6.9 | 330 |
| Nicotine | 8270(3550) | 2 | 10-150 | 0-50 | 820 | 3300 |
| 2-Nitroaniline | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 39<br>800 | 1700<br>800 |
| 3-Nitroaniline | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 15<br>800 | 1700<br>800 |
| 4-Nitroaniline | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-150<br>NA | 0-50<br>NA | 21<br>800 | 1700<br>800 |
| Nitrobenzene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 35-180<br>NA | 0-40<br>NA | 33<br>330 | 330<br>330 |
| 2-Nitrophenol | 8270(3550)<br>CLP 3/90 | 2<br>62 | 29-182<br>NA | 0-40<br>NA | 18<br>330 | 330<br>330 |
| 4-Nitrophenol (MS) | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-130<br>11-114 | 0-34<br>0-50 | 27<br>800 | 1700<br>800 |
| 4-Nitroquinoline-1-oxide | 8270(3550) | 2 | 10-150 | 0-50 | 1200 | 3300 |
| N-Nitroso-di-n-butylamine | 8270(3550) | 2 | 10-150 | 0-50 | 16 | 330 |
| N-Nitrosodiethylamine | 8270(3550) | 2 | 10-150 | 0-50 | 13 | 330 |
| N-Nitrosodimethylamine | 8270(3550) | 2 | 10-150 | 0-50 | 44 | 330 |
| N-Nitroso-di-n-propylamine (MS) | 8270(3550)<br>CLP 3/90 | 2<br>62 | 27-140<br>41-126 | 0-35<br>0-38 | 60<br>330 | 330<br>330 |
| N-Nitrosomethylethylamine | 8270(3550) | 2 | 10-150 | 0-50 | 13 | 330 |
| N-Nitrosomorpholine | 8270(3550) | 2 | 10-150 | 0-50 | 17 | 330 |
| N-Nitrosopiperidine | 8270(3550) | 2 | 10-150 | 0-50 | 9.3 | 330 |
| N-Nitrosopyrrolidine | 8270(3550) | 2 | 10-150 | 0-50 | 40 | 330 |
| 5-Nitro-o-toluidine | 8270(3550) | 2 | 10-150 | 0-50 | 82 | 330 |
| PCB 1016 | 8270(3550) | 2 | 10-150 | 0-50 | 4200 | 17000 |
| PCB 1221 | 8270(3550) | 2 | 10-150 | 0-50 | 4200 | 17000 |
| PCB 1232 | 8270(3550) | 2 | 10-150 | 0-50 | 4200 | 17000 |
| PCB 1242 | 8270(3550) | 2 | 10-150 | 0-50 | 4200 | 17000 |
| PCB 1248 | 8270(3550) | 2 | 10-150 | 0-50 | 4200 | 17000 |
| PCB 1254 | 8270(3550) | 2 | 10-150 | 0-50 | 4200 | 17000 |
| PCB 1260 | 8270(3550) | 2 | 10-150 | 0-50 | 4200 | 17000 |
| Pentachlorobenzene | 8270(3550) | 2 | 10-150 | 0-50 | 21 | 330 |
| Pentachloronitrobenzene | 8270(3550) | 2 | 10-150 | 0-50 | 24 | 330 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Pentachlorophenol (MS) | 8270(3550)<br>CLP 3/90 | 2<br>62 | 10-107<br>17-109 | 0-89<br>0-47 | 27<br>800 | 1700<br>800 |
| Phenacetin | 8270(3550) | 2 | 10-150 | 0-50 | 13 | 330 |
| Phenanthrene | 8270(3550)<br>CLP 3/90 | 2<br>62 | 56-129<br>NA | 0-21<br>NA | 12<br>330 | 330<br>330 |
| Phenol (MS) | 8270(3550)<br>CLP 3/90 | 2<br>62 | 37-112<br>26-90 | 0-36<br>0-35 | 38<br>330 | 330<br>330 |
| p-Phenylenediamine | 8270(3550) | 2 | 10-150 | 0-50 | 140 | 1700 |
| 2-Picoline | 8270(3550) | 2 | 10-150 | 0-50 | 62 | 330 |
| Pronamide | 8270(3550) | 2 | 10-150 | 0-50 | 16 | 330 |
| Pyrene (MS) | 8270(3550)<br>CLP 3/90 | 2<br>62 | 33-139<br>35-142 | 0-25<br>0-36 | 11<br>330 | 330<br>330 |
| Pyridine | 8270(3550) | 2 | 10-150 | 0-50 | 34 | 330 |
| Safrole | 8270(3550) | 2 | 10-150 | 0-50 | 15 | 330 |
| Strychnine | 8270(3550) | 2 | 10-150 | 0-50 | 820 | 3300 |
| Trichlorophenols (2,4,5 AND 2,4,6) | 8270(3550) | 2 | NA | NA | 34 | 330 |
| 1,2,4,5-Tetrachlorobenzene | 8270(3550) | 2 | 10-150 | 0-50 | 16 | 330 |
| 2,3,4,5-Tetrachlorophenol | 8270***(3550) | 2 | 10-150 | 0-50 | 420 | 1700 |
| 2,3,4,6-Tetrachlorophenol | 8270(3550) | 2 | 36-121 | 0-31 | 21 | 1700 |
| o-Toluidine | 8270(3550) | 2 | 10-150 | 0-50 | 11 | 330 |
| Toxaphene | 8270(3550) | 2 | 10-150 | 0-50 | 1700 | 67000 |
| 1,2,4-Trichlorobenzene (MS) | 8270(3550)<br>CLP 3/90 | 2<br>62 | 48-107<br>38-107 | 0-28<br>0-23 | 21<br>330 | 330<br>330 |
| Tetrachlorophenols (2,3,4,5 and 2,3,4,6) | 8270(3550) | 2 | NA | NA | 21 | 1700 |
| 2,4,5-Trichlorophenol | 8270(3550)<br>CLP 3/90 | 2<br>62 | 39-123<br>NA | 0-27<br>NA | 34<br>800 | 330<br>800 |
| 2,4,6-Trichlorophenol | 8270(3550)<br>CLP 3/90 | 2<br>62 | 37-144<br>NA | 0-40<br>NA | 33<br>330 | 330<br>330 |
| o,o,o-Triethylphosphorothioate | 8270(3550) | 2 | 10-150 | 0-50 | 18 | 330 |
| 1,3,5-Trinitrobenzene | 8270(3550) | 2 | 10-150 | 0-50 | 14 | 330 |
| Surrogate - Nitrobenzene-d5 | 8270(3550)<br>CLP 3/90 | 2<br>62 | 22-124<br>23-120 | NA<br>NA | NA<br>NA | NA<br>NA |
| Surrogate - 2-Fluorobiphenyl | 8270(3550)<br>CLP 3/90 | 2<br>62 | 35-116<br>30-115 | NA<br>NA | NA<br>NA | NA<br>NA |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Surrogate - p-Terphenyl-d14 | 8270(3550)<br>CLP 3/90 | 2<br>62 | 29-137<br>18-137 | NA<br>NA | NA<br>NA | NA<br>NA |
| Surrogate - Phenol-d5 | 8270(3550)<br>CLP 3/90 | 2<br>62 | 32-123<br>24-113 | NA<br>NA | NA<br>NA | NA<br>NA |
| Surrogate - 2-Fluorophenol | 8270(3550)<br>CLP 3/90 | 2<br>62 | 27-120<br>25-121 | NA<br>NA | NA<br>NA | NA<br>NA |
| Surrogate - 2,4,6-Tribromophenol | 8270(3550)<br>CLP 3/90 | 2<br>62 | 17-123<br>19-122 | NA<br>NA | NA<br>NA | NA<br>NA |
| Surrogate - 2-Chlorophenol-d4 | CLP 3/90 | 62 | 20-130 | NA | NA | NA |
| Surrogate - 1,2-Dichlorobenzene-d4 | CLP 3/90 | 62 | 20-130 | NA | NA | NA |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) | 8280<br>8270 (Qual. Screen) | 2<br>2 | 69-145<br>NA | 0-40<br>NA | 0.26<br>330 | 0.50<br>330 |
| Polychlorinated Dibenzo-p-dioxins and Dibenzofurans classes | | | | | | |
| tetra-CDD | 8280 | 2 | 69-145 | 0-40 | 0.26 | 0.50 |
| tetra-CDF | 8280 | 2 | 59-142 | 0-40 | 0.20 | 0.50 |
| penta-CDD | 8280 | 2 | 41-203 | 0-40 | 0.21 | 0.50 |
| penta-CDF | 8280 | 2 | 55-146 | 0-40 | 0.16 | 0.50 |
| hexa-CDD | 8280 | 2 | 45-174 | 0-53 | 0.31 | 0.50 |
| hexa-CDF | 8280 | 2 | 50-154 | 0-46 | 0.22 | 0.50 |
| hepta-CDD | 8280 | 2 | 20-170 | 0-50 | 0.42 | 1.0 |
| hepta-CDF | 8280 | 2 | 20-170 | 0-50 | 0.24 | 1.0 |
| octa-CDD | 8280 | 2 | 20-170 | 0-50 | 0.84 | 1.0 |
| octa-CDF | 8280 | 2 | 20-170 | 0-50 | 0.66 | 1.0 |
| Internal Standard - $^{13}C_{12}$-2,3,7,8-TCDD | 8280 | 2 | 40-120 | NA | NA | NA |
| Internal Standard - $^{13}C_{12}$-OCDD | 8280 | 2 | 40-120 | NA | NA | NA |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Aminocarb | 632(3550)*** | 13/2 | 50-150 | 0-50 | 5.0 | 20 |
| Barban | 632(3550)***V | 13/2 | 50-150 | 0-50 | 5.8 | 20 |
| Bromacil | 632(3550)*** | 13/2 | 50-150 | 0-50 | 10 | 40 |
| Carbaryl (MS) | 632(3550)***V | 13/2 | 50-150 | 0-50 | 6.8 | 50 |
| Carbofuran | 632(3550)***V | 13/2 | 50-150 | 0-50 | 7.5 | 50 |
| Chloropropham | 632(3550)***V | 13/2 | 50-150 | 0-50 | 5.8 | 20 |
| Diuron (MS) | 632(3550)***V | 13/2 | 50-150 | 0-50 | 0.74 | 5.0 |
| Fenuron | 632(3550)***V | 13/2 | 50-150 | 0-50 | 2.4 | 10 |
| Flometuron | 632(3550)***V | 13/2 | 50-150 | 0-50 | 2.1 | 10 |
| Linuron | 632(3550)***V | 13/2 | 50-150 | 0-50 | 0.87 | 5.0 |
| Methomyl | 632(3550)***V | 13/2 | 50-150 | 0-50 | 44 | 200 |
| Methiocarb | 632(3550)***V | 13/2 | 50-150 | 0-50 | 13 | 50 |
| Monuron | 632(3550)***V | 13/2 | 50-150 | 0-50 | 0.94 | 5.0 |
| Neburon | 632(3550)***V | 13/2 | 50-150 | 0-50 | 0.88 | 5.0 |
| Oxamyl | 632(3550)***V | 13/2 | 50-150 | 0-50 | 14 | 50 |
| Propham | 632(3550)***V | 13/2 | 50-150 | 0-50 | 14 | 50 |
| Propoxur | 632(3550)***V | 13/2 | 50-150 | 0-50 | 12 | 50 |
| Siduron | 632(3550)***V | 13/2 | 50-150 | 0-50 | 3.9 | 20 |
| Swep | 632(3550)***V | 13/2 | 50-150 | 0-50 | 5.0 | 20 |
| Surrogate - Propachlor | 632(3550)*** | 13/2 | 25-148 | NA | NA | NA |
| Picloram | 644(3550)*** | 64/2 | 40-150 | 0-50 | 4.2 | 17 |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Acenaphthene (MS) | 8310 | 2 | 11-144 | 0-35 | 5.4 | 20 |
| Acenaphthylene | 8310 | 2 | 10-139 | 0-40 | 3.9 | 20 |
| Anthracene | 8310 | 2 | 10-126 | 0-40 | 0.15 | 4.0 |
| Benzo(a)anthracene | 8310 | 2 | 12-135 | 0-40 | 0.27 | 4.0 |
| Benzo(b)fluoranthene | 8310 | 2 | 10-150 | 0-40 | 0.12 | 4.0 |
| Benzo(k)fluoranthene | 8310 | 2 | 10-159 | 0-40 | 0.10 | 10 |
| Benzo(g,h,i)perylene | 8310 | 2 | 10-120 | 0-40 | 0.42 | 10 |
| Benzo(a)pyrene | 8310 | 2 | 10-128 | 0-40 | 0.37 | 4.0 |
| Carbazole | 8310*** | 2 | 10-150 | 0-40 | 5.0 | 20 |
| Chrysene (MS) | 8310 | 2 | 10-199 | 0-40 | 0.19 | 4.0 |
| Dibenz(a,h)acridine | 8310*** | 2 | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | 8310 | 2 | 10-110 | 0-40 | 0.79 | 20 |
| Fluoranthene | 8310 | 2 | 56-136 | 0-28 | 0.27 | 10 |
| Fluorene (MS) | 8310 | 2 | 10-142 | 0-40 | 1.0 | 10 |
| Indene | 8310*** | 2 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 8310 | 2 | 10-116 | 0-40 | 0.20 | 10 |
| 6-Methylchrysene | 8310*** | 2 | NA | NA | NA | NA |
| 1-Methylnaphthalene | 8310*** | 2 | 10-125 | 0-40 | 5.0 | 20 |
| 2-Methylnaphthalene | 8310*** | 2 | 10-125 | 0-40 | 5.0 | 20 |
| Naphthalene (MS) | 8310 | 2 | 31-159 | 0-34 | 5.0 | 20 |
| Phenanthrene | 8310 | 2 | 10-155 | 0-40 | 0.58 | 4.0 |
| Pyrene (MS) | 8310 | 2 | 49-156 | 0-28 | 0.41 | 10 |
| Thiophenol | 8310*** | 2 | NA | NA | NA | NA |
| Surrogate - 4-Terphenyl-d4 | 8310 | 2 | 28-106 | NA | NA | NA |

**TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND PRACTICAL QUANTITATION LIMITS (Reporting Limit (ug/kg)) FOR SOLIDS AND SEMISOLIDS**

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| Acetaldehyde | 8315 | 2 | 30-110 | 0-40 | 500 | 2000 |
| Formaldehyde | 8315 | 2 | 50-155 | 0-40 | 77 | 250 |
| Aldicarb (Temik) (MS) | 8318 | 2 | 44-114 | 0-50 | 7.4 | 30 |
| Aldicarb sulfone | 8318 | 2 | 58-118 | 0-50 | 7.9 | 30 |
| Aldicarb sulfoxide | 8318***v | 2 | 33-143 | 0-50 | 8.3 | 30 |
| Carbofuran (Furadan) (MS) | 8318 | 2 | 53-123 | 0-50 | 7.4 | 30 |
| Carbaryl (Sevin) | 8318 | 2 | 56-126 | 0-50 | 6.6 | 30 |
| Dioxacarb | 8318 | 2 | 55-125 | 0-50 | 14 | 50 |
| 3-Hydroxycarbofuran | 8318 | 2 | 60-120 | 0-50 | 6.7 | 30 |
| Methiocarb (Mesurol) | 8318 | 2 | 52-122 | 0-50 | 11 | 50 |
| Methomyl (Lannate) | 8318 | 2 | 54-114 | 0-50 | 9.5 | 30 |
| Oxamyl (MS) | 8318***v | 2 | 45-161 | 0-50 | 8.0 | 30 |
| Promecarb | 8318 | 2 | 44-120 | 0-50 | 7.7 | 50 |
| Propoxur (Baygon) | 8318 | 2 | 46-116 | 0-50 | 9.8 | 30 |

## TABLE 5.2. LABORATORY ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR SOLIDS AND SEMISOLIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (ug/kg) | Reporting Limit (ug/kg) |
|---|---|---|---|---|---|---|
| 2-Amino-4,6-dinitrotoluene | 8330 | 2 | 50-150 | 0-30 | 50 | 250 |
| 4-Amino-2,6-dinitrotoluene | 8330 | 2 | 50-150 | 0-30 | 78 | 500 |
| 1,3-Dinitrobenzene (MS) | 8330 | 2 | 54-166 | 0-30 | 22 | 250 |
| 2,4-Dinitrotoluene (MS) | 8330 | 2 | 60-140 | 0-30 | 60 | 250 |
| 2,6-Dinitrotoluene | 8330 | 2 | 60-140 | 0-30 | 82 | 500 |
| Diphenylamine | 8330***V | 2 | 65-140 | 0-30 | 16 | 100 |
| Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) | 8330 | 2 | 54-166 | 0-30 | 54 | 500 |
| Methyl-2,4,6-trinitro-phenylnitramine (Tetryl) | 8330 | 2 | 41-165 | 0-30 | 82 | 500 |
| Nitrobenzene | 8330 | 2 | 52-152 | 0-30 | 12 | 250 |
| Nitroglycerin | 8330***V | 2 | 46-190 | 0-50 | 38 | 1000 |
| n-Nitrosodiphenylamine | 8330***V | 2 | 55-121 | 0-30 | 32 | 100 |
| 2-Nitrotoluene (MS) | 8330 | 2 | 50-144 | 0-30 | 74 | 250 |
| 3-Nitrotoluene | 8330 | 2 | 55-165 | 0-30 | 25 | 250 |
| 4-Nitrotoluene | 8330 | 2 | 54-166 | 0-30 | 53 | 250 |
| Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) | 8330 | 2 | 54-162 | 0-30 | 160 | 500 |
| Pentaerythritol tetranitrate (PETN) | 8330 | 2 | 50-150 | 0-30 | 34 | 1000 |
| 1,3,5-Trinitrobenzene | 8330 | 2 | 50-150 | 0-30 | 27 | 250 |
| 2,4,6-Trinitrotoluene | 8330 | 2 | 50-170 | 0-30 | 60 | 250 |
| Surrogate - 3,4-Dinitrotoluene | 8330 | 2 | 40-140 | NA | NA | NA |
| Thiodiglycol | SL-SOP | 68 | 70-140 | 0-50 | 400 | 1500 |

## TABLE 5.3. FIELD ANALYTICAL METHODS, QA OBJECTIVES AND METHOD DETECTION LIMITS (MDL) FOR WATER AND OTHER LIQUIDS

| PARAMETER | METHOD (Prep) | REFERENCE | ACCURACY* (% Rec) | PRECISION* (% RPD) | MDL** (mg/L) | Reporting Limit (mg/L) |
|---|---|---|---|---|---|---|
| Chlorine, residual | 330.5 | 3 | NA | 0-40 | NA | 1.0 |
| Hydrogen ion (pH) | 150.1/9040 | 3/2 | 85-115 | 0-15 | NA | NA |
| Oxygen (dissolved) | 360.1 | 3 | NA | 0-30 | NA | 0.20 |
| Salinity | 210 | 4 | NA | NA | NA | 100 |
| Specific conductance | 120.1/9050 | 3/2 | 90-110 | 0-10 | 0.26 µS/cm | 1.0 µS/cm |
| Temperature | 170.1 | 3 | NA | 0-10 | NA | NA |
| Turbidity | 180.1/214A | 3/4 | 60-140 | 0-30 | 0.067 NTU | 0.10 NTU |
| Water level | EPA | 12 | NA | 0-5 | NA | 0.10 ft |

**REFERENCES AND NOTES FOR TABLES 5.1, 5.2, AND 5.3**

* Accuracy data are presented as recoveries for spikes or surrogates. For routine analysis of organics, percent recoveries are evaluated only on the CLP or lab selected spiking compounds. The routine organic matrix spiking compounds are designated by an (MS) following the parameter name. Not all of the matrix spike or surrogate compounds listed in these tables are used with a given set of samples. Precision data are presented as relative percent difference (%RPD). Since reportable levels (above detection limit) for most of the organic parameters may not be detected in all environmental samples, precision is usually evaluated on duplicate spike data.

Accuracy and precision control limits are primarily derived from in-house laboratory data. Some accuracy and precision control limits have been rounded to the nearest "5". In some cases, published limits may be used in lieu of in-house limits because insufficient in-house data are available to calculate limits. In cases where insufficient data are available to generate in-house limits, and no EPA-approved method limits exist, limits are estimated based on available data.

** Method Detection Limit

*** This compound is not included in EPA's list of compounds for this method. However, Savannah Laboratories has verified (validated) that this compound can be analyzed by this method and will report data for this compound if specifically requested by the client.

***V Method validation data for this compound are included in Appendix A.

1. *Code of Federal Regulations, Title 40, Part 136*; U.S. Government Printing Office: Washington, DC, July 1, 1988.

2. *Test Methods for Evaluating Solid Waste, Third Edition, SW-846*; U.S. EPA Office of Solid Waste and Emergency Response: Washington, DC.

3. *Methods for Chemical Analysis of Water and Wastes*; U.S. EPA Office of Research and Development: Cincinnati, OH, March 1983; EPA 600/4-79-020.

4. *Standard Methods for the Examination of Water and Wastewater*, Seventeenth Edition; American Public Health Association: Washington, DC, 1989.

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6. CLP - US EPA Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Medium, Multi-Concentration, Revision 10/92.

7. *Determination of Triazine Pesticides in Industrial and Municipal Wastewater: EPA Method 619*; January, 1982.

8. *Determination of Thiophosphate Pesticides in Industrial and Municipal Wastewater: EPA Method 622.1*; January, 1982.

9. *Determination of Dinitroaniline Pesticides in Industrial and Municipal Wastewater: EPA Method 627*; January, 1982.

10. *Determination of Organochlorine Pesticides in Industrial and Municipal Wastewater: EPA Method 608.1*; February, 1982.

12. *Analytical Procedures for Detection and Quantification of Total Petroleum Fuel Hydrocarbons and Fuel Constituents*: Calif. Method for Modified 8015; Don M. Eisenberg, Adam W. Olivier, Peter W. Johnson, Daniel S. Tempelis; September, 1985.

13. *Determination of Carbamate and Urea Pesticides in Industrial and Municipal Wastewater: EPA Method 632*; January, 1982.

14. *Determination of Organophosphorus Pesticides in Industrial and Municipal Wastewater: EPA Method 622*; January, 1982.

15. *Determination of Thiocarbamate Pesticides in Industrial and Municipal Wastewaters by Gas Chromatography: EPA Method 634*; January, 1982.

16. *Determination of Bensulide in Industrial and Municipal Wastewaters by Liquid Chromatography: EPA Method 636.*

17. *Determination of Mercaptobenzothiazole in Wastewaters by Liquid Chromatography: EPA Method 640.*

18. *Determination of Hexachlorophene and Dichlorophen in Industrial and Municipal Wastewaters: EPA Method 604.1.*

19. *Determination of Rotenone in Industrial and Municipal Wastewaters by Liquid Chromatography: EPA Method 635.*

20. *Determination of Bendiocarb in Industrial and Municipal Wastewaters by Liquid Chromatography: EPA Method 639.*

21. *Determination of Oryzalin in Industrial and Municipal Wastewaters: EPA Method 638.*

22. *Determination of MBTS and TCMTB in Industrial and Municipal Wastewater by Liquid Chromatography: EPA Method 637.*

23. *Determination of Diphenylamine in Industrial and Municipal Wastewater by Gas Chromatography: EPA Method 620.*

24. *C, H, and O Compounds: EPA Method 616.*

25. *Determination of Cyanazine in Industrial and Municipal Wastewater: EPA Method 629;* January, 1982.

26. *Determination of Organohalide Pesticides and PCBs in Industrial and Municipal Wastewater: EPA Method 617*; January, 1982.

27. *Determination of Volatile Pesticides in Municipal and Industrial Wastewater by Gas Chromatography: EPA Method 618.*

28. *Analysis of Certain Amine Pesticides and Lethane in Wastewater by Gas Chromatography: EPA Method 645.*

30. *Measurement of Trihalomethanes in Drinking Water with Gas Chromatography/ Mass Spectrometry and Selected Ion Monitoring*: EPA Method 501.3.

31. Method from FDER Central Lab

33. *Measurement of N-Methyl Carbamoyloximes and N-Methyl Carbamates in Drinking Water by Direct Aqueous Injection HPLC with Post Column Derivatization: EPA Method 531.*

35. NIOSH - *National Institute for Occupational Safety and Health*, Third Edition, 1987.

36. *Official Methods of Analysis of the Association of Official Analytical Chemists, Method for Formaldehyde 20.063 (Chromotropic Acid)*, Thirteenth Edition, 1980.

38. *Annual Book of ASTM Standards, Part 23*; ASTM: Philadelphia, PA, 1980.

39. *Annual Book of ASTM Standards, Volume 11.01/11.02*; ASTM: Philadelphia, PA, 1989.

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41. *Determination of Organophosphorus Pesticides in Industrial and Municipal Wastewater*: EPA Method 633.

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43. *Methods of Soil Analysis, American Society of Agronomy, Inc.*, Number 9, Part 2, page 570, (Walkley-Black Procedure).

44. *EPA 600/4-84-008, Appendix D: Method For Extractable Organic Halides (EOX) In Solids*, January, 1984.

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49. *Analysis of THMs in Finished Waters by the Purge and Trap Method: EPA Method 501.1.*

50. *Analysis of THMs in Drinking Water by Liquid/Liquid Extraction; EPA Method 501.2.*

51. *EPA 600/4-88-039: Methods for the Determination of Organic Compounds in Drinking Water*, December, 1988.

52. *Determination of Organophosphorus Pesticides in Municipal and Industrial Wastewater: EPA Method 614*, February, 1982.

53. *Determination of Chlorinated Herbicides in Municipal and Industrial Wastewater: EPA Method 615*, 1982.

54. *EPA 600/4-80-032: Prescribed Procedures for Measurement of Radioactivity in Drinking Water*, August, 1980.

55. *Determination of Benomyl and Carabendazim in Wastewater: EPA Method 631.*

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57. *Pesticides in Wastewater: EPA Method 608.2.*

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59. *Analysis of Bentazon in Wastewater by Liquid Chromatography: EPA Method 643.*

60. *Calculation of Un-Ionized Ammonia in Fresh Water*; FL DEP, October, 1983.

61. Bellar, T.A., and Lichtenberg, J. J.; *The Determination of Polychlorinated Biphenyls in Transformer Fluid and Waste Oils*; U.S. EPA Environmental Monitoring and Support Laboratory: Cincinnati, OH, September, 1982; EPA-600/4-81-045.

62. CLP - US EPA Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration, Revision OLM01.0 (3/90) thru OLM01.8 (8/91).

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68. Savannah Laboratories' SOPs, 1994.

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70. *Method for the Determination of Gasoline Range Organics*, State of Tennessee Department of Environment and Conservation, Division of Underground Storage Tanks.

## 6.0 SAMPLING PROCEDURES

When Savannah Laboratories has field sampling responsibilities, an experienced field sampling crew will be sent to the site for sample collection and delivery of samples to the laboratory. Each crew will be supervised by a highly qualified field sampling manager who is trained according to EPA and DEP protocol for groundwater and other environmental sampling. On past projects, these managers have had their field sampling techniques critiqued by DEP personnel (Bureau of Groundwater Protection), Georgia EPD personnel, and EPA Region IV field coordinators.

The DEP sampling SOPs have been adopted by Savannah Laboratories. The notarized statement of intent is found at the end of this section.

### 6.1 Sampling Capabilities

Savannah Laboratories has the capability for sampling groundwater, surface water, wastewater, soils, sediments/sludges, drinking water, and tissues for the following analyte classes:

| Analyte Class | Sample Source |
|---|---|
| Volatile Organics (VOCs) | Drinking water, groundwater, surface water, wastewater, soils, sediments, and tissues |
| Semivolatile Organics | Drinking water, groundwater, surface water, wastewater, soils, sediments, and tissues |
| Pesticides/Herbicides/PCBs | Drinking water, groundwater, surface water, wastewater, soils, sediments, and tissues |
| Metals (total and/or dissolved) | Drinking water, groundwater, surface water, wastewater, soils, sediments, and tissues |
| Radionuclides | Drinking water, groundwater, surface water, wastewater, soils, and sediments |
| Coliform (total/fecal) | Drinking water, groundwater, surface water, wastewater, soils, sediments and tissues |
| Cyanide/Sulfide | Drinking water, groundwater, surface water, wastewater, soils and sediments |
| TRPH, TPH[1] | Drinking water, groundwater, surface water, wastewater, soils and sediments |
| Nutrients[2] | Drinking water, groundwater, surface water, wastewater, soils and sediments |
| General: pH, specific conductance, temperature, turbidity, TSS, TDS, TOC, DO, COD, BOD | Drinking water, groundwater, surface water, wastewater, soils and sediments |

**Footnotes:**
(1) TRPH = Total Recoverable Petroleum Hydrocarbons
TPH = Total Petroleum Hydrocarbons

(2) Nutrients = Nitrogen, Phosphorus Series; Chloride, Sulfate

## 6.2 Sampling Equipment

Sampling equipment conforms to construction and usage conditions detailed in the DEP *General Sampling Procedures* SOP, Section 4, Revised September, 1992. A specific equipment listing is provided at the beginning of each subsection of "Sampling Procedures" (Section 6.4).

Following is a list of other routinely used equipment.

| Item | Use |
|---|---|
| Ice chests, styrofoam or insulated plastic | Sample container and sample transport |
| Sampling vehicles | Sample container and sample transport |
| Field thermometer | Field measurement of temperature |
| Field pH meter | Field measurement of pH |
| Field conductivity meter | Field measurement of conductivity |
| Electronic water level indicator | Well volume calculation |
| Stainless steel tape measure | Well volume calculation |
| Nylon line | Well volume calculation |
| Sheet plastic | Contamination control |
| Aluminum foil | Contamination control |
| Plastic or metal buckets | Collection of purge water or cleaning wastes |
| Cleaning brushes | Equipment decontamination |
| Liquinox detergent | Equipment decontamination |
| Analyte-free water contained in contaminant-free glass or plastic bottles | Equipment decontamination |
| Isopropyl alcohol (nanograde) contained in contaminant-free glass or plastic bottles | Equipment decontamination |
| 10% Nitric acid (metals grade) contained in contaminant-free glass bottles | Equipment decontamination (except for stainless steel equipment) |
| Glass or plastic jugs | Transport of cleaning wastes |
| Sample preservation reagents contained in dispenser bottles or reagent bottles | Sample preservation |
| Field carrier (covered, divided tray or box) | Transport of preservation reagents |
| pH paper | Field-check of sample preservation |
| Disposable pipettes | Addition of preservation reagents |
| Standard buffer solutions | Calibration of field pH meter |
| Standard KCl solution | Calibration check of field conductivity meter |
| Disposable unpowdered latex gloves | Contamination control |

## 6.3 Decontamination and Cleaning Procedures

Sample containers will be obtained or cleaned in the DEP Sampling Procedures SOP, Section 4.4.1, revised September, 1992.

Sampling equipment will be cleaned and decontaminated according to protocols outlined in the DEP Sampling Procedures SOP, Section 4.1, revised September, 1992.

## 6.4 Sampling Protocols

### 6.4.1 General Considerations

All sampling will be performed according to the general protocols outlined in the DEP Sampling Procedures SOP, revised September, 1992.

### 6.4.2 Wastewater Sampling

Wastewater samples will be collected according to the DEP Sampling Procedures SOP, Section 4.2.4, revised September, 1992.

Below is a list of equipment available for wastewater sampling and the parameters which may be sampled.

| Type | Construction Materials | Use | Permissible Parameters |
|---|---|---|---|
| Autosampler[1] | Silicon tubing, plastic collection vessel | Composite samples | Metals, non-metallic inorganics, nutrients, demands, radionuclides |
| | Teflon tubing, glass collection vessel | Composite samples | Organics, non-metallic inorganics, nutrients, demands, radionuclides |
| Kemmerer | SS or glass, acrylic stopper | Grab @ specific depth | All inorganics |
| Bucket, beaker, unpreserved sample bottle, dipper[2] | SS, glass or Teflon<br>Plastic | Discrete grab<br>Discrete grab | All<br>All inorganics<br>Radionuclides |

[1] Three automatic samplers are available among the six divisions. Refrigeration capability is available.
[2] Device is lowered into stream via decontaminated lines or rods.

### 6.4.3 Surface Water Sampling

Surface water samples will be collected according to the DEP Sampling Procedures SOP, Section 4.3.2, revised September, 1992 and the *EPA Region IV Standard Operating Procedures and Quality Assurance Manual*, Section 4.8.3, revised February 1991. Below is a list of equipment available for surface water sampling and the parameters which may be sampled.

| Type | Material | Use | Permissible Parameters |
|---|---|---|---|
| DO Dunker | SS or glass | discrete grab, depth composite | All |
| Kemmerer | SS or glass acrylic stopper | grab @ specific depth | Inorganics<br>Radionuclides |
| Beaker | SS or glass | discrete grab[1] | All |
| Bailer | SS or Teflon | grab @ specific depth[2] | All |
| Peristaltic pump with weighted tubing | SS or Teflon silicon tubing | grab at specific depth | Inorganics<br>Radionuclides |

**Footnotes:**
1 Beaker is inverted, submerged, then turned over to fill.
2 Depth limited by length of bailer.

### 6.4.4 Groundwater Sampling

Groundwater samples will be collected according to the DEP Sampling Procedures SOP, Section 4.2.5, revised September, 1992.

Below is a listing of pump types and tubing materials used by Savannah Laboratories. Equipment may be interchanged among the six laboratory locations according to need.

| Pump Type | Units | Use | Parameters | Description |
|---|---|---|---|---|
| Positive displacement | | | | |
| Submersible | 4 | Purging | All | 1 |
| Bladder | 2 | Purging, sampling | Inorganics<br>Radionuclides | 2 |
| Suction lift | | | | |
| Centrifugal | 4 | Purging | All | 3 |
| Peristaltic | 4 | Field filtration, purging | Metals<br>Radionuclides | 4 |

1. Submersible pump housing, internal surfaces, and upper fitting for tubing are stainless steel. A 4' to 8' length of Teflon tubing is attached to the stainless steel fitting. The remainder of the discharge tubing is garden hose. The suspension cable is 3' to 4' of stainless steel or Teflon-coated stainless steel, attached to a nylon rope. A check valve at the upper stainless steel/Teflon junction prevents backflow of purge water into the well.

2. The bladder pump housing is Lexan plastic and the tubing is polyethylene. This pump is used for purging only in the case of 2" diameter deep wells. After bladder pump purging, one well volume is purged with an appropriate bailer prior to sampling.

3. Centrifugal surface pumps utilize 4' joinable sections of PVC pipe with a 3' to 4' Teflon tail piece. Only the Teflon portion contacts the formation water. A foot valve prevents backflow of purge water into the well.

4. Peristaltic pumps are routinely used only for in-line field filtration of metals samples. Tubing may be medical grade silicone, Tygon, or polypropylene flexible tubing. On rare occasions, a small diameter shallow well may be purged using this pump. In this case, a Teflon tailpipe arrangement would be used, with only the Teflon contacting the formation water. To prevent backflow of purge water, the tubing is withdrawn from the well while the pump is running.

Below is a listing of bailer materials available for groundwater sampling.

| Bailer Material | Permissible Parameters | Non-permissible Parameters |
|---|---|---|
| PVC | Metals; non-metallic inorganics: nutrients, demands; biological | Organics, volatile or extractable |
| Stainless Steel | All parameters | None |
| Teflon | All parameters | None |
| Clear PVC or acrylic | Free product thickness | |

### 6.4.5 Potable Water Sampling

Potable water samples will be collected according to the DEP Sampling Procedures SOP, Section 4.2.7, revised September, 1992, and the *EPA Region IV SOP and QAM*, Section 4.10.2, revised February 1991. Equipment available for potable water sampling is listed under groundwater sampling (6.4.4).

### 6.4.6 Sampling for Soil and Sediment

Soil samples will be collected according to the DEP Sampling Procedures SOP, Section 4.3.4, revised September, 1992.

Sediments will be collected according to the DEP Sampling Procedures SOP, Section 4.3.5, revised September, 1992 and the *EPA Region IV SOP and QAM*, Section 4.8.3.3, revised February 1991.

Below is a list of soil and sediment sampling devices used by Savannah Laboratories.

| Type | Material | Use | Permissible Parameters |
|---|---|---|---|
| Trowel, spoon | SS<br>Teflon-coated SS | sampling | All |
| Shovel | Aluminum<br>SS | sampling<br>sampling | Demands, nutrients<br>Metals, organics , radionuclides |
| Corer | SS<br>PVC pipe | sampling<br>sampling | All<br>Inorganics<br>Radionuclides |
| Hand auger | SS | sampling | All |
| Ponar grab sampler | SS | sediment sampling | All |
| Mixing tray | Metal, foil-lined glass<br>Plastic | homogenizing, compositing<br>homogenizing, compositing | Extractable organics<br>Inorganics<br>Radionuclides |

### 6.4.7 Sludge Sampling

Domestic waste residual sludges will be collected according to the *EPA POTW Sludge Sampling and Analysis Guidance Document*, revised August 1989.

Sludges from solid and hazardous waste sites will be collected according to the *EPA Region IV SOP and QAM*, Sections 4.12.3 and 4.12.5, revised February 1991.

The same equipment listed for soil and sediment sampling may also be used for sludge sampling.

### 6.4.8 Liquid Hazardous Waste

Hazardous wastes, drums, and tanks of unknown origins and concentrations are typically not sampled by Savannah Laboratories because the sample operations are inherently dangerous to the personnel involved. Drums and tanks are occasionally sampled when the primary constituents are known and do not present a toxic, fire, or explosion hazard.

If drum, tank or pit sampling is undertaken, it is performed according to the *EPA Region IV SOP and QAM*, Sections 4.12.3 and 4.12.4, Revised February 1991, and may require the equipment given below.

| Type | Material | Use | Permissible Parameters |
|---|---|---|---|
| Drum-plug wrench | Manganese bronze head | Open bungs | |
| Coliwasa sampler | Glass | Sampling | All |
| Mixing Tubing (4' lengths) | Glass | Sampling | All |
| Bucket, beaker, unpreserved sample bottle | SS, glass, Teflon | Grab | All |
| Dipper | Plastic | Grab | All inorganics |

### 6.4.9 Biological Specimens and Tissues

Fish tissues are collected and prepared for analysis according to DEP Sampling Procedures SOP, Section 4.3.6, revised September, 1992, using properly decontaminated stainless steel implements.

Other biological specimens are obtained and prepared in a manner which will preclude contamination from implements or other specimens.

## 6.5 Special Sampling Considerations

Details of sampling such as compositing and mixing, duplicate or split samples, filtration, and special procedures for volatiles, oil and grease, and microbiological samples will be observed as outlined in the DEP Sampling Procedures SOP, revised September, 1992.

## 6.6 Sample Preservation and Holding Times

Sample preservation, holding times, sample volumes, and container types are listed in Table 6.1 for water samples. Table 6.2 lists similar information for soil and sediment samples. Table 6.1 is taken from *40 CFR Part 136*, Table II. Table 6.2 is taken from DEP Sampling Procedures SOP, Table 4.4, revised September, 1992. Table 6.2 lists additional

recommended soil holding times based upon conservative estimates of experienced laboratory chemists and consistent with good laboratory practice. Table 6.3 lists the approved procedures, preservation, and holding times for water for parameters not listed on Table 6.1.

## 6.7 Sample Preservation Protocols

Sample preservation, checks and adjustments will be accomplished according to the DEP Sampling Procedures SOP revised September, 1992. The efficacy of the preservation is checked in the field, for all preserved samples except volatiles, oil and grease and total petroleum hydrocarbons. Necessary adjustments will be made and recorded in a field logbook.

## 6.8 Sample Dispatch and Recordkeeping

Samples will be labeled, packed, and shipped according to the DEP Sampling Procedures SOP, Section 4.4, revised September, 1992. Examples of a sample label, a monitoring well sampling log, and a chain-of-custody form are present in Figures 6.1, 6.2, and 6.3.

See Section 7 for sample custody procedures.

## 6.9 Field Reagent and Standard Storage

All reagents, standards, and solvents used in field activities are stored and transported as listed in Table 6.4 and according to the DEP Sampling Procedures SOP, Section 4.4.4, revised September, 1992.

## 6.10 Field Waste Disposal

Field-generated wastes will be handled according to the DEP Sampling Procedure SOP, Section 4.4.5. Wastes transported back to the laboratory for disposal will be handled in accordance with Section 8.4 of this document.

**TABLE 6.1**

CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES FOR WATER SAMPLES

| PARAMETER | SAMPLE CONTAINER[1] | SAMPLE PRESERVATION[2,3] | RECOMMENDED HOLDING TIMES[4] |
|---|---|---|---|
| **Bacterial Tests:** | | | |
| Coliform, fecal and total | 250-mL P | Cool, 4°C, 0.008% $Na_2S_2O_3$[5] | 6 hours |
| Fecal streptococci | 250-mL P | Cool, 4°C, 0.008% $Na_2S_2O_3$[5] | 6 hours |
| **Inorganic Tests:** | | | |
| Acidity | 250-mL P | Cool, 4°C | 14 days |
| Alkalinity | 250-mL P | Cool, 4°C | 14 days |
| Ammonia | 100-mL P | Cool, 4°C, $H_2SO_4$ to pH < 2 | 28 days |
| Biochemical oxygen demand (including carbonaceous) | 1-L P | Cool, 4°C | 48 hours |
| Bromide | 100-mL P | None required | 28 days |
| Chemical oxygen demand | 100-mL P | Cool, 4°C, $H_2SO_4$ to pH < 2 | 28 days |
| Chloride | 100-mL P | None required | 28 days |
| Chlorine, total residual | 250-mL amber G | None required | Analyze immediately |
| Color | 250-mL P | Cool, 4°C | 48 hours |
| Cyanide, total and amenable to chlorination | 1-L P | Cool, 4°C, NaOH to pH > 12, 0.6 g ascorbic acid | 14 days[6] |
| Fluoride | 100-mL P | None required | 28 days |
| Hardness | 250-mL P | $HNO_3$ to pH < 2, $H_2SO_4$ to pH < 2 | 6 months |
| Hydrogen ion (pH) | 100-mL P | None required | Analyze immediately |
| Kjeldahl and organic nitrogen | 250-mL P | Cool, 4°C, $H_2SO_4$ to pH < 2 | 28 days |
| Chromium VI | 250-mL P | Cool, 4°C | 24 hours |
| Mercury[7] | 130-mL G | $HNO_3$ to pH < 2 | 28 days |
| Metals[7], except chromium VI and mercury | 250-mL P | $HNO_3$ to pH < 2 | 6 months |
| Nitrate | 100-mL P | Cool, 4°C | 48 hours |
| Nitrate-nitrite | 100-mL P | Cool, 4°C, $H_2SO_4$ to pH < 2 | 28 days |
| Nitrite | 100-mL P | Cool, 4°C | 48 hours |
| Organic carbon | 125-mL amber G | Cool, 4°C, HCl or $H_2SO_4$ to pH < 2 | 28 days |

**TABLE 6.1**

CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES FOR WATER SAMPLES

| PARAMETER | SAMPLE CONTAINER[1] | SAMPLE PRESERVATION[2,3] | RECOMMENDED HOLDING TIMES[4] |
|---|---|---|---|
| Orthophosphate | 100-mL P | Filter immediately, cool, 4°C | 48 hours |
| Oxygen, dissolved (electrode) | G bottle & top | None required | Analyze immediately |
| Oxygen, dissolved (Winkler) | G bottle & top | Fix on site and store in dark | 8 hours |
| Phosphorus, total | 250-mL P | Cool, 4°C, $H_2SO_4$ to pH < 2 | 28 days |
| Residue, total | 500-mL P | Cool, 4°C | 7 days |
| Residue, filterable (TDS) | 250-mL P | Cool, 4°C | 7 days |
| Residue, nonfilterable (TSS) | 500-mL P | Cool, 4°C | 7 days |
| Residue, settleable | 500-mL P | Cool, 4°C | 48 hours |
| Residue, volatile (VSS) | 500-mL P | Cool, 4°C | 7 days |
| Silica | 250-mL P | Cool, 4°C | 28 days |
| Specific Conductance | 100-mL P | Cool, 4°C | 28 days |
| Sulfate | 100-mL P | Cool, 4°C | 28 days |
| Sulfide | 250-mL P | Cool, 4°C, add zinc acetate plus sodium hydroxide to pH > 9 | 7 days |
| Sulfite | 100-mL P | None required | Analyze immediately |
| Surfactants | 250-mL P | Cool, 4°C | 48 hours |
| Temperature | 100-mL P | None required | Analyze immediately |
| Turbidity | 250-mL P | Cool, 4°C | 48 hours |
| **Organic Tests:**[6] | | | |
| Purgeable halocarbons | 3 X 40-mL G, Teflon-lined septum | Cool, 4°C, 0.008% $Na_2S_2O_3$[5] or 0.06% ascorbic acid[5] | 14 days |
| Purgeable aromatic hydrocarbons | 3 X 40-mL G, Teflon-lined septum | Cool, 4°C, 0.008% $Na_2S_2O_3$[5] or 0.06% ascorbic acid[5],HCl to pH < 2[9] | 14 days |
| Acrolein and acrylonitrile | 3 X 40-mL G, Teflon-lined septum | Cool, 4°C, 0.008% $Na_2S_2O_3$[5], adjust pH to 4-5[10] or 0.06% ascorbic acid[5] | 14 days |
| Phenols[11] | 2 X 1-L G, Teflon-lined cap | Cool, 4°C, 0.008% $Na_2S_2O_3$[5] | Extraction-7 days<br>Analysis-40 days |
| Benzidines[11,12] | 2 X 1-L G, Teflon-lined cap | Cool, 4°C, 0.008% $Na_2S_2O_3$[5] | Extraction-7 days[13] |

**TABLE 6.1**

**CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES FOR WATER SAMPLES**

| PARAMETER | SAMPLE CONTAINER[1] | SAMPLE PRESERVATION[2,3] | RECOMMENDED HOLDING TIMES[4] |
|---|---|---|---|
| Phthalate esters[11] | 2 X 1-L G, Teflon-lined cap | Cool, 4°C | Extraction-7 days<br>Analysis-40 days |
| Nitrosamines[11,14] | 2 X 1-L G, Teflon-lined cap | Cool, 4°C, store in dark, 0.008% $Na_2S_2O_3$[5] | Extraction-7 days<br>Analysis-40 days |
| Pesticides[11] | 2 X 1-L G, Teflon-lined cap | Cool, 4°C, pH 5-9[15] | Extraction-7 days<br>Analysis-40 days |
| PCBs[11] | 2 X 1-L G, Teflon-lined cap | Cool, 4°C | Extraction-7 days<br>Analysis-40 days |
| Nitroaromatics and isophorone[11] | 2 X 1-L G, Teflon-lined cap | Cool, 4°C, 0.008% $Na_2S_2O_3$[5] store in dark | Extraction-7 days<br>Analysis-40 days |
| Polynuclear aromatic hydrocarbons[11] | 2 X 1-L G, Teflon-lined cap | Cool, 4°C, 0.008% $Na_2S_2O_3$[5] | Extraction-7 days<br>Analysis-40 days |
| Haloethers[11] | 2 X 1-L G, Teflon-lined cap | Cool, 4°C, 0.008% $Na_2S_2O_3$[5] | Extraction-7 days<br>Analysis-40 days |
| Chlorinated hydrocarbons[11] | 2 X 1-L G, Teflon-lined cap | Cool, 4°C | Extraction-7 days<br>Analysis-40 days |
| TCDD[11] (8280) | 2 X 1-L G, Teflon-lined cap | Cool, 4°C, 0.008% $Na_2S_2O_3$[5] | Extraction-30 days<br>Analysis-45 days of collection |
| TCDD[11] (613) | 2 X 1-L G, Teflon-lined cap | Cool, 4°C, 0.008% $Na_2S_2O_3$[5] | Extraction-7 days<br>Analysis-40 days of collection |
| Total organic halogens | 500-mL amber G, Teflon-lined cap | Cool, 4°C, $H_2SO_4$ to pH < 2 | 28 days |
| Total petroleum hydrocarbons | 500-mL G, Teflon-lined cap | Cool, 4°C, HCl to < 2 | 28 days |
| Phenols, total recoverable | 1-L G | Cool, 4°C, $H_2SO_4$ to pH < 2 | 28 days |
| Oil and grease | 2 X 500-mL G | Cool, 4°C, $H_2SO_4$ to pH < 2 | 28 days |
| N-Methylcarbamoyloximes and N-Methylcarbamates | 125-mL G, Teflon-lined septum | Cool, 4°C, 0.008% $Na_2S_2O_3$[5], monochloroacetic acid to pH < 3 | Analysis - 28 days if pH adjusted and frozen at -10° C upon receipt at lab |
| Glyphosate | 125-mL G, Teflon-lined septum | Cool, 4°C, 0.008% $Na_2S_2O_3$[5], store in dark | Analysis - 14 days, 18 months if frozen |
| Diquat and Paraquat | 500-mL high density foil wrapped PCB, Teflon-lined cap | Cool, 4°C, 0.008% $Na_2S_2O_3$[5], NaOH or $H_2SO_4$ to pH < 2, store in dark | Extraction - 7 days<br>Analysis - 21 days |
| Benomyl and Carbendazim | 1-L amber G, Teflon-lined cap | Cool, 4°C | Extraction - 7 days<br>Analysis - 40 days |

**TABLE 6.1**

**CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES FOR WATER SAMPLES**

| PARAMETER | SAMPLE CONTAINER[1] | SAMPLE PRESERVATION[2,3] | RECOMMENDED HOLDING TIMES[4] |
|---|---|---|---|
| Carbamate and Urea Pesticides | 1-L amber G, Teflon-lined cap | Cool, 4°C | Extraction - 7 days<br>Analysis - 40 days |
| Oryzalin | 1-L amber G, Teflon-lined cap | Cool, 4°C NaOH or $H_2SO_4$ to pH 6-8 | Extraction - 7 days<br>Analysis - 40 days |
| Carbonyl Compounds | 2 X 125-mL amber G, Teflon-lined cap | Cool, 4°C | Derivatization and extraction - 3 days<br>Analysis - 3 days |
| N-Methylcarbamates | 2 X 125-mL amber G, Teflon-lined cap | Cool, 4°C, monochloroacetic acid to pH 4-5, store in dark | Extraction - 7 days<br>Analysis - 40 days |
| Nitroaromatics and Nitroamines | 1-L amber G, Teflon-lined cap | Cool, 4°C, store in dark | Extraction - 7 days<br>Analysis - 40 days |
| Asulam | 125-mL G, Teflon-lined septum | Cool, 4°C | 21 days |
| Ethylenethiourea | 125-mL G, Teflon-lined septum | Cool, 4°C, store in dark | Extraction - 7 days<br>Analysis - 21 days |
| Thiodiglycol | 125-mL G, Teflon-lined septum | Cool, 4°C | Extraction - 7 days<br>Analysis - 40 days |
| **Radiological Tests:** | | | |
| Alpha, beta and radium | 1-L P | $HNO_3$ to pH < 2 | 6 Months |

1. Polyethylene (P) or Glass (G). In cases where more than one inorganic parameter with the sample preservative is required, a single sample container of sufficient size for all analyses is usually preferred. Such grouping of parameters will be indicated when bottles are provided for client sampling.

2. Sample preservation should be performed immediately upon sample collection. For composite chemical samples, each aliquot should be preserved at the time of collection. When use of an automated sampler makes it impossible to preserve each aliquot, chemical samples may be preserved by maintaining at 4°C until compositing and sample splitting are completed.

3. When any sample is to be shipped by common carrier or sent through the United States mail, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR Part 172). The person offering such material for transportation is responsible for ensuring such compliance. For the preservation requirements, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials Regulations do not apply to the following: hydrochloric acid (HCl) in water solutions at concentrations of 0.04% by weight or less (pH about 1.96 or greater); nitric acid ($HNO_3$) in water solutions at concentrations of 0.15% by

weight or less (pH about 1.62 or greater); sulfuric acid ($H_2SO_4$) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater); and sodium hydroxide (NaOH) in water solutions at concentrations of 0.080% by weight or less (pH about 12.30 or less).

4. Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still be considered valid.

5. Sodium thiosulfate or ascorbic acid may be used only if residual chlorine is present. The dechlorination agent and hydrochloric acid must not be combined in pre-preserved vials.

6. Maximum holding time is 24 hours when sulfide is present. Optionally, all samples may be tested with lead acetate paper before pH adjustments in order to determine if sulfide is present. If sulfide is present, it can be removed by the addition of cadmium nitrate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12.

7. Samples should be filtered immediately on-site before adding preservative for dissolved metals.

8. Guidance applies to samples to be analyzed by GC, LC, or GC/MS for specific compounds.

9. Sample receiving no pH adjustments must be analyzed within seven days of sampling.

10. The pH adjustment is not required if acrolein will not be measured. Samples for acrolein receiving no pH adjustment must be analyzed within three days of sampling.

11. When the extractable analytes of concern fall within a single chemical category, the specified preservative and maximum holding times should be observed for optimum safeguard of sample integrity. When the analytes of concern fall within two or more chemical categories, the sample may be preserved by cooling to 4°C, reducing residual chlorine with 0.008% sodium thiosulfate, storing in the dark, and adjusting the pH to 6-9; samples preserved in this manner may be held for seven days before extraction and for forty days after extraction. Exceptions to this optional preservation and holding time procedure are noted in Footnote 5 (re: the requirement for thiosulfate reduction of residual chlorine), and Footnotes 12 and 13 (re: the analysis of benzidine).

12. If 1,2-diphenylhydrazine is likely to be present, adjust the pH of the sample to 4.0 ± 0.2 to prevent rearrangement to benzidine.

13. Extracts may be stored up to seven days before analysis if storage is conducted under an inert (oxidant-free) atmosphere.

14. For the analysis of diphenylnitrosamine, add 0.008% $Na_2S_2O_3$ and adjust pH to 7-10 within 24 hours of sampling.

15. The pH adjustment may be performed upon receipt at the laboratory and may be omitted if the samples are extracted within 72 hours of collection. For the analysis of aldrin, add 0.008% $Na_2S_2O_3$.

**TABLE 6.2**

CONTAINERS, PRESERVATION TECHNIQUES,
AND HOLDING TIMES FOR SOIL OR SEDIMENT SAMPLES

| PARAMETER | SAMPLE CONTAINER | SAMPLE PRESERVATION | RECOMMENDED HOLDING TIMES |
|---|---|---|---|
| Alpha, beta | 100-mL P | None Required | 6 Months |
| Cyanide | 250-mL P | Cool to 4°C | 14 days |
| Sulfide | 250-mL P | Cool to 4°C | 7 days |
| Oil & grease, Total petroleum hydrocarbons | 250-mL G | Cool to 4°C | 28 days |
| Nutrients/TOC | 250-mL P | Cool to 4°C | 28 days |
| Metals (except Mercury) | 500-mL P | Cool to 4°C | 6 months |
| Semivolatile organics | 500-mL G with Teflon-lined lid | Dark, cool to 4°C | Extraction-14 days Analysis-within 40 days of extraction |
| Volatile organics | 125-mL amber G with Teflon-lined lid | Dark, cool to 4°C | 14 days |
| Mercury | 250-mL P | Cool to 4°C | 28 days |
| Carbonyl Compounds | 100-mL G, Teflon-lined lid | Cool to 4°C | Derivatization and extraction - 3 days Analysis - 3 days |

**TABLE 6.3

APPROVED WATER AND WASTEWATER PROCEDURES, CONTAINERS, PRESERVATION AND HOLDING TIMES FOR PARAMETERS NOT FOUND IN 40 CFR 136

| Parameter | Method | Reference[1] | Container[2] | Preservation[3] | Maximum Holding Times[4] |
|---|---|---|---|---|---|
| Bromate | Ion Chromatography | EPA-SOP (300.0)[5] | P, G | Cool, 4° C | 30 days |
| Chlorophyll | Spectrophotometric | SM 1002G | P, G[6] | 14 d in dark | 30 days[7] |
| Corrosivity | Calculated ($CaCO_3$ Stability, Langelier Index) | SM 203 ASTM 0513-82 | P, G | Cool, 4° C[7] | 7 days[8] |
| Odor | Human Panel | SM 207 | G only | Cool, 4° C | 6 hours |
| Salinity | Electrometric[8] Hydrometric Argentometric | SM 210A | G, wax seal | Analyze immediately or use wax seal | 30 days[9] |
| Transparency | Irradiometric[9] | 17-3.021 FAC | ---- | ---- | Analyze in-situ |
| Un-ionized Ammonia | Calculated[10] | DER-SOP[11] | P, G | Cool, 4° C $Na_2S_2O_3$[11] | 8 hours unpreserved 28 days preserved[11] |
| Organic Pesticides[12] | GC and HPLC | EPA (600-Series)[12] | [13] | [13] | [13] |

** Source: 17-160.700, F.A.C.

1. SM XXX - procedures from "Standard Methods for the Examination of Water and Wastewater", APHA-AWWA-WPCF, 16th Edition, 1985.

2. P = plastic, G = Glass

3. When specified, sample preservation should be performed immediately upon sample collection.

4. The times listed are the maximum times that samples may be held before analysis and still be considered valid.

5. "Determination of Inorganic Disinfection By-Products by Ion Chromatography, Method 300.0" by John D. Pfaff and Carol a. Brockoff, U.S. EPA, Cincinnati, Ohio 45268 (copy available from the DER QA Section).

6. Collect sample in opaque bottles and process under reduced light. Samples on filter taken from water having pH 7 or higher may be placed in airtight plastic bags and stored frozen for up to three weeks. Samples from acidic water must be processed promptly to prevent chlorophyll degradation.

7. Temperature and pH must be measured on site at the time of sample collection. Seven days is the maximum time for laboratory analysis of total alkalinity, calcium ion and total solids.

8. The eletrometric and hydrometric analytical methods are suited for field use. The argentometric method is suited for laboratory use. Samples collected for laboratory analysis, when properly sealed with paraffin waxed stopper, may be held indefinitely. The maximum holding time of 30 days is recommended as a practical regulatory limit.

9. Transparency in surface waters is defined as a compensation point for photosynthetic activity, i.e., the depth at which one percent of the light intensity entering at the water surface remains unabsorbed. The DER rule 17-3 FAC requires that the light intensities at the surface and subsurface be measured simultaneously by irradiance meters such as the Kahlsico Underwater Irradiometer, Model No. 268 WA 310, or an equivalent device having a comparable spectral response.

10. The results of the measurements of pH, temperature, salinity (if applicable) and the ammonium ion concentration in the sample are used to calculate the concentration of ammonia in the unionized state. Temperature, pH and salinity must be measured on site at the time of sample collection. Laboratory analysis

of the ammonium ion concentration should be conducted within eight hours of sample collection. If prompt analysis of ammonia is impossible, preserve samples with $H_2SO_4$ to pH between 1.5 and 2. Acid-preserved samples, stored at 4° C, may be held up to 28 days for ammonia determination. Sodium thiosulfate should only be used if fresh samples contain residual chlorine.

11. DER Central Analytical Laboratory, Tallahassee, FL, Revision No. 1, October 3, 1983. The 1983 draft is available from the DER QA Section.

12. Other pesticides listed in approved EPA methods (608.1, 608.2, 614, 614.1, 615, 617, 618, 619, 622, 622.1, 627, 629, 631, 632, 632.1, 633, 643, 644 and 645) which are not included in Table 1D of 40 CFR Part 136 (July 1989).

13. Container, preservation and holding time as specified in each individual method shall be followed.

FIGURE 6.1

Bottle _____

Preservative _____

Location _____

Analysis _____

Sample ID _____

Date _____ By _____

9191

**Figure 6.2**

| MONITORING WELL SAMPLING LOG | |
|---|---|
| Client/Facility: | |
| Well ID: | |
| Well Locked: ☐ Yes ☐ No | Bailer Present: ☐ Yes ☐ No |
| * Water Level: _____ (0.01 ft.) | Well Depth: _____ (ft) |
| Water Evacuation: _____ (liters) | Yield: _____ (L/H) |
| Floaters: ☐ Yes ☐ No | Sinkers: ☐ Yes ☐ No |
| ** pH: _____ (units) | Calibrated: _____/_____ (Date/Time) |
| ** SC: _____ (umhos/cm) | Calibrated: _____/_____ (Date/Time) |
| ** Temp: _____ (°C) | Calibrated: _____ (Date/Time) |
| Bottles Labeled: ☐ Yes ☐ No | |
| Sampling Completed: _____/_____ (Date/Time) | |
| Bailer Returned & Well Locked: ☐ Yes ☐ No | |
| Custody Form Completed: ☐ Yes ☐ No | |
| Samples Iced: ☐ Yes ☐ No | |
| Coolers Sealed: ☐ Yes ☐ No | Seal No: |
| Carrier: | Date/Time: |
| Collector Signature: | Date/Time: |
| NOTES: | |

* Fisher Electronic WL Meter
** Corning Checkmate 90

# SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

## ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD


☐ 5102 LaRoche Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 878-3994 — Fax: (904) 878-9504
☐ 414 SW 12th Avenue, Deerfield Beach, FL 33442 — Phone: (305) 421-7400 — Fax: (305) 421-2584
☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (205) 666-6633 — Fax: (205) 666-6696
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049


| PROJECT REFERENCE | PROJECT NO. | P.O. NUMBER |
|---|---|---|
| PROJECT LOCATION (State) | SAMPLER(s) NAME | TELEPHONE / FAX |
| CLIENT NAME | CLIENT PROJECT MANAGER | |
| CLIENT ADDRESS | | |

MATRIX TYPE: WASTEWATER / NON-WASTEWATER / SOIL / AIR

REQUIRED ANALYSES

PAGE ___ OF ___

☐ STANDARD TAT

☐ EXPEDITED TAT*

REPORT DUE DATE _____

* SUBJECT TO RUSH FEES

| SAMPLING DATE | SAMPLING TIME | SAMPLE IDENTIFICATON | NUMBER OF CONTAINERS SUBMITTED | REMARKS |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |

| RELINQUISHED BY: (SIGNATURE) | DATE | TIME | RECEIVED BY: (SIGNATURE) | DATE | TIME | RELINQUISHED BY: (SIGNATURE) | DATE | TIME |
|---|---|---|---|---|---|---|---|---|
| RECEIVED BY: (SIGNATURE) | DATE | TIME | RELINQUISHED BY: (SIGNATURE) | DATE | TIME | RECEIVED BY: (SIGNATURE) | DATE | TIME |

LABORATORY USE ONLY

| RECEIVED FOR LABORATORY BY: (SIGNATURE) | DATE | TIME | CUSTODY INTACT ☐ YES ☐ NO | CUSTODY SEAL NO. | SL LOG NO. | LABORATORY REMARKS: |
|---|---|---|---|---|---|---|
| | | | | | | |

ORIGINAL

FIGURE 6.3

**TABLE 6.4**

FIELD REAGENT STORAGE AND TRANSPORT

| CHEMICAL | METHOD OF STORAGE | METHOD OF TRANSPORT |
|---|---|---|
| Nitric Acid | Stored in original container or dedicated repipet dispenser in vented acid storage cabinet; segregated from other acids. | Transferred to dedicated reagent bottle or repipet dispenser; transported in divided box containing only acids (each acid in separate compartment). |
| Hydrochloric acid | See above | See above |
| Sulfuric acid | See above | See above |
| Sodium hydroxide | Dry flake or pellet form stored in original container in reagent cabinet. solutions stored in separate cabinet. | Dry forms transported in original or dedicated transfer container. Solutions transferred to dedicated plastic container and transported segregated from acids. |
| Zinc acetate solution | Stored in dedicated repipet dispenser in reagent storage cabinet. | Transported in compartmentalized box in capped repipet dispenser. |
| EDTA Solution | Stored in dedicated repipet dispenser in reagent storage cabinet. | Transported in compartmentalized box in capped repipet dispenser. |
| Isopropanol | Stored in original container in vented solvent storage cabinet in volatile analysis/custody area. | Transported in bottle jacket in original container. |
| pH and conductivity standards | Stored in reagent storage cabinet in air conditioned laboratory. | Transported in dedicated plastic containers. |

## 6.11 Analyte-Free Water

Analyte-free water used in cleaning and field QC samples is defined as water from any source which exhibits no interferences or analytes of interest above the applicable reporting limits.

Analyte-free water may be obtained from the following sources, but is not limited to these sources.

Laboratory deionized: most inorganics

Laboratory deionized with Milli-Q-type polishing: all analytes

Sterilized laboratory deionized: microbiology

Deep well water: any analysis for which acceptability is demonstrated. This water may be purged with nitrogen for VOA determination.

Purchased distilled: any analysis for which acceptability is demonstrated

Analyte-free water will be used as the final rinse in field or lab cleaning procedures, and for trip blanks, field blanks, equipment blanks, and laboratory blanks.

Documentation of analyte-free water sources is maintained via results of trip blanks, equipment blanks, laboratory blanks, control blanks, and container blanks.

# STATEMENT OF INTENT TO COMPLY WITH THE DEPARTMENT OF ENVIRONMENTAL REGULATION STANDARD OPERATING PROCEDURES FOR LABORATORY OPERATIONS AND SAMPLE COLLECTION ACTIVITIES

## FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
Quality Assurance Section

Part I: STANDARD OPERATING PROCEDURES TO BE INCORPORATED INTO COMPREHENSIVE QA PLANS

Name of Organization:

Savannah Laboratories and Environmental Services

Address:

5102 LaRoche Ave. Savannah,Georgia 31406

Comprehensive QA Plan Number:

Check the specific protocols that your organization will be using while collecting and/or analyzing environmental samples. NOTE: check only documents and protocols as listed in the "DER Standard Operating Procedures for Laboratory Operations and Sample Collection Activities" (DER-QA-001/92) dated September 30, 1992 for which your organization has current equipment capabilities.

THIS FORM MUST BE ACCOMPANIED BY THE SUPPORTING DOCUMENTATION SPECIFIED IN DER-QA-001/92

__ ORGANIZATION AND RESPONSIBILITY (Chapter 3)

FIELD ACTIVITIES (Chapter 4):

Field Decontamination and Cleaning Protocols:

X Container Cleaning protocols (4.4.1):
- X Sample containers cleaned by organization
- X Sample containers obtained precleaned from commercial vendor
- __ Sample containers obtained precleaned from laboratory with an approved Comprehensive QA Plan

X General Considerations and Reagents (4.1.1 through 4.1.3)
X Sampling Equipment (4.1.4)
X Automatic Samplers (4.1.5)
X Field Filtration Equipment (4.1.6)
X Teflon Tubing (4.1.7.1)
X Non-teflon Tubing (4.1.7.2 through 4.1.7.5)
X Pumps used only for Purging (4.1.8.1 and 4.1.8.2)
X Pumps used for Purging and Sampling (4.1.8.1 and 4.1.8.2)
X Non-Sampling Equipment (Augers, etc.) (4.1.9)
X Analyte-Free Water Containers (4.1.10)
X Ice Chests and Shipping Containers (4.1.11)
X Field Meters, Flow Meters and Other Field Instruments including Lanyards, Well Sounders and Tapes (4.1.9)

Sampling Protocols:

X General (4.0)

Aqueous Matrices:

X General Concerns and Special Sample Handling Procedures (4.2.1 and 4.2.2)
X Surface Water (4.2.3)
X Wastewater (4.2.4)
X Groundwater (4.2.5)
X Wells with in-place Plumbing (4.2.6)
X Potable Well Sampling (4.2.7)
X Drinking Water Supply System (4.2.8)
X Temporary Well Points (4.2.9)
X Air Stripper and Remedial Treatment Systems (4.2.10)
X Bioassay (4.2.11)

Solid Matrices:

X General Concerns and Special Sample Handling Procedures (4.3.1 through 4.3.3)
X Soil (4.3.4)
X Sediment (4.3.5)
X Fish Tissue (4.3.6)
__ Shellfish (4.3.7)
X Domestic Waste Sludges (Residuals) (4.3.8)
X Sludges - Solid and Hazardous Wastes (4.3.9)
X Liquid Hazardous Wastes (4.3.9)
__ Macrobenthic Invertebrates (4.3.10)

Preservation, Holding Times and Containers Types:

X Aqueous samples - 40 CFR Part 136, Table II (4.4.2)
X Aqueous samples - 17-160.700, F.A.C., Table 4 (4.4.2)
X Aqueous samples - 17-160.700, F.A.C., Table 8 (4.4.2)
X Solid samples - 17-160.700, F.A.C., Table 5 (4.4.2)

Part I: STANDARD OPERATING PROCEDURES TO BE INCORPORATED INTO COMPREHENSIVE QA PLANS, cont.

Preservatives are:
- X Provided by the laboratory in separate containers
- X Provided by the laboratory already premeasured into the containers
- X Provided by the field consultant

Field-Related Activities:
- X Sample Dispatch (4.4.3)
- X Reagent and Standard Storage (4.4.4)
- X Field Waste Disposal (4.4.5)

SAMPLE CUSTODY AND DOCUMENTATION (Chapter 5):
- ___ General Requirements (5.1)
- ___ Preparation of Field-Sampling Supplies (5.2)
- ___ Custody and Documentation for Field Operations (5.3)
- ___ Custody and Documentation for Laboratory Operations (5.4)
- ___ Electronic Data Documentation (5.5)
- ___ Legal or Evidentiary Custody (5.6)

ANALYTICAL PROCEDURES (Chapter 6):
- ___ Laboratory Glassware Cleaning and Storage Protocols (6.1)
- ___ Laboratory Reagent Storage (6.2)
- ___ Laboratory Waste Disposal (6.3)

CALIBRATION PROCEDURES AND FREQUENCY (Chapter 7):
- ___ General Requirements and Documentation (7.1, 7.2, 7.8 and 7.9)
- ___ Standard Receipt and Traceability (Sec. 7.3)
- ___ Frequency of Standard Preparation and Standard Storage (Sec. 7.4)

Field:
- ___ General Requirements (7.5.1)
- ___ pH (7.5.2)
- ___ Temperature (7.5.3)
- ___ Dissolved Oxygen (7.5.4)
- ___ Automatic Wastewater-type Samplers (7.5.8)
- ___ Specific Conductance (7.5.5)
- ___ Chlorine Measurements (7.5.6)
- ___ OVAs (7.5.7)

Laboratory:
- ___ Laboratory Instruments (7.6)
- ___ Support Equipment Calibration (7.7)

___ PREVENTATIVE MAINTENANCE (Chapter 8.0)

QUALITY CONTROL REQUIREMENTS AND ROUTINES TO CALCULATE AND ASSESS PRECISION, ACCURACY AND METHOD DETECTION LIMITS (Chapter 9):
- ___ Documentation (9.4)

Field Quality Control Requirements:
- ___ Minimum Field Quality Control Requirements (9.1.1)

Laboratory Quality Control Requirements:
- ___ Chemical Analysis (9.1.2.1)
- ___ Microbiological Analysis (9.1.2.2)
- ___ Toxicity (Bioassay) Tests (9.1.2.3)
- ___ Macrobenthic Species Identification (9.1.2.4)
- ___ Formulae for Calculating and Assessing Precision and Accuracy (9.2)
- ___ Formulae for Calculating Method Detection Limits (9.3)

___ DATA REDUCTION, VALIDATION AND REPORTING (Chapter 10)

___ CORRECTIVE ACTION (Chapter 11)

___ PERFORMANCE AND SYSTEMS AUDITS (Chapter 12)

___ QUALITY ASSURANCE REPORTS (Chapter 13)

## Part II: CERTIFICATION

The undersigned, Janette D. Long (name) Vice President (title) Savannah Laboratories and Environmental Services (organization), and Alan C. Bailey (name) Quality Assurance Manager (title) Savannah Laboratories and Environmental Services (organization), hereby certify that they have obtained copies of all documents pertinent to the protocols that they have identified on the document titled "Standard Operating Procedures to be Incorporated into Comprehensive QA Plans" and that these documents shall be incorporated by reference into the Comprehensive Quality Assurance Plan attached hereto or identified herein. They further certify that the organization of which they are officials or officers as identified herein has the instrumentation and/or equipment and capability to perform the protocols specified by these documents and that they will be responsible for the implementation of said protocols when performing the specified activity. They certify that the officials and employees of the organization identified herein are committed to generating data of a known and verifiable quality. They further certify that they understand that final approval of the Comprehensive Quality Assurance Plan attached hereto or identified herein is contingent upon satisfying the Department's review requirements.

They further certify that the information, statements, facts and representations given and made above are true and correct to the best of their knowledge and belief, and that they are aware that any misrepresentations or falsifications constitute grounds for rejection of approval of the Comprehensive QA Plan attached hereto or identified herein, and that anyone who knowingly makes a false statement in writing with the intent to mislead a public servant in the performance of his official duty shall be guilty of a misdemeanor, of the second degree in violation of Section 837.06, Florida Statutes.

5.27.94
DATE

Janette D. Long

(print name Janette D. Long)

(Title: Vice President)

(Organization Savannah Laboratories)

5-27-94
DATE

(print name(s) Alan C. Bailey)

Quality Assurance Officer(s)

(Organization Savannah Laboratories)



DER Form 17-150.900(2) Revised 12-92

# 7.0 SAMPLE CUSTODY

## 7.1 Sample Custody Objectives

The primary objective of sample custody is to provide accurate, verified, and traceable records of sample possession and handling from sample container shipment through laboratory receipt and sample disposition.

Evidence of documentation of sample collection, shipment, laboratory receipt and custody is accomplished utilizing a chain-of-custody record (Figure 7.1). A sample is considered in custody if it is:

- in actual possession of the sampler or transferee
- in view after being in physical possession of the sampler or transferee
- sealed so that sample integrity will be maintained while in possession of the sampler or transferee
- in a secured area, restricted to authorized personnel.

### 7.1.1 Custody Record Maintenance

Field and laboratory records are maintained in a secure area. All field and laboratory data are recorded in bound notebooks and entries are made in waterproof ink. Field and laboratory data entry errors are deleted with a one-line strike through the error. Correction tape or other substances designed to obliterate documentation are strictly prohibited in the laboratory or custody areas. The correction is initialed and dated by the sampling or analytical staff member making the change. Field and laboratory information is documented on prepared forms. All forms for recording field and laboratory data include spaces for date and initials which must be completed by the data recorder. Field and laboratory documentation not recorded on prepared forms is also dated and initialed.

## 7.2 Sample and Legal Custody Procedures

All samples are received by the laboratory custodian under either routine or special legal chain-of-custody procedures. Legal custody is a special type of sample custody in which all events associated with a specific sample are documented in writing.

## 7.3 Laboratory and Field Custody Procedures

The following procedures apply to the custody activities observed by Savannah Laboratories during sample or legal custody procedures.

### 7.3.1 Selection and Preparation of Sample Containers Supplied to a Client or Sampling Team

Sample containers provided by SL are constructed from EPA designated materials, contain EPA prescribed preservatives and are affixed with an SL identification label (Figure 7.2). In order to monitor container temperature, a 100-mL plastic container labeled "Sample Container

# SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

## ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD


☐ 5102 Unification Avenue, Savannah, GA 31404 — Phone: (912) 354-7858 — Fax: (912) 352-0165
☐ 2846 Industrial Plaza Drive, Tallahassee, FL 32301 — Phone: (904) 878-3994 — Fax: (904) 878-9504
☐ 414 SW 12th Avenue, Deerfield Beach, FL 33442 — Phone: (305) 421-7400 — Fax: (305) 421-2584
☐ 900 Lakeside Drive, Mobile, AL 36693 — Phone: (205) 666-6633 — Fax: (205) 666-6690
☐ 6712 Benjamin Road, Suite 100, Tampa, FL 33634 — Phone: (813) 885-7427 — Fax: (813) 885-7049


| PROJECT REFERENCE | PROJECT NO. | P.O. NUMBER |
|---|---|---|
| PROJECT LOCATION (State) | SAMPLER(s) NAME | TELEPHONE / FAX |
| CLIENT NAME | CLIENT PROJECT MANAGER | |
| CLIENT ADDRESS | | |

MATRIX TYPE: SOIL/SOLID, WATER/AQUEOUS, OIL/NON-AQUEOUS, AIR/GAS

REQUIRED ANALYSES

PAGE ___ OF ___

☐ STANDARD TAT

☐ EXPEDITED TAT*

REPORT DUE DATE _____

* SUBJECT TO RUSH FEES

| SAMPLING DATE | SAMPLING TIME | SAMPLE IDENTIFICATON | NUMBER OF CONTAINERS SUBMITTED | REMARKS |
|---|---|---|---|---|
| | | | | |
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| RELINQUISHED BY: (SIGNATURE) | DATE | TIME | RECEIVED BY: (SIGNATURE) | DATE | TIME | RELINQUISHED BY: (SIGNATURE) | DATE | TIME |
|---|---|---|---|---|---|---|---|---|
| RECEIVED BY: (SIGNATURE) | DATE | TIME | RELINQUISHED BY: (SIGNATURE) | DATE | TIME | RECEIVED BY: (SIGNATURE) | DATE | TIME |

LABORATORY USE ONLY

| RECEIVED FOR LABORATORY BY: (SIGNATURE) | DATE | TIME | CUSTODY INTACT ☐ YES ☐ NO | CUSTODY SEAL NO. | SL LOG NO. | LABORATORY REMARKS: |
|---|---|---|---|---|---|---|
| | | | | | | |

FIGURE 7.1

Section 7
Revision 1
Date: 5/94
Page 2 of 21

ORIGINAL

300

FIGURE 7.2

Bottle _____

Preservative _____

Location _____

Analysis _____

Sample ID _____

Date _____ By _____

9191

Temperature-Lab Use Only" is prefilled with tap water and supplied with each sample shipment to monitor sample temperature upon receipt.

Projects which require sample containers to be screened for contaminating properties prior to shipment and certified "contaminant-free" can be provided upon the client's request and expense. Containers will be provided with a unique batch assignment number to permit traceability. A sample container preparation logbook (Figure 7.3) is maintained by custody personnel in the event this level of service is requested. All standard custody procedures are maintained for precleaned sample containers.

### 7.3.2 Chain of Custody Documentation, Traceability, and Sample Integrity

Formal chain-of-custody procedures are initiated by a ***custody dispatch technician*** who is responsible for organization and relinquishment of sample containers to the client or field personnel.

All field information must be properly recorded on the chain-of-custody form. Proper completion of the form is the responsibility of the ***field sampling manager*** and is required prior to relinquishment of the samples. If the site location is different from the client address, the site location is recorded in the "Project Name" space on the chain-of-custody form, or on the right hand side of the form if additional space is required. The sample identities assigned in the field are recorded in the "Sample Identification" column. Common carriers may identify themselves by signing the "Relinquished By" space on the chain-of-custody form.

For samples transported from the field to the laboratory by common carrier, chain of custody is maintained. Completed custody forms must accompany each sealed cooler, and are placed in a plastic bag and taped to the inside lid of the cooler. At the client's request, coolers are sealed in the field with the SL Custody Seal (Figure 7.4) or custody tape by the field sampling team to ensure that tampering will be immediately evident. A unique identification number is recorded on the seal and accompanying chain-of-custody form with waterproof ink. A copy of each airbill package tracking form associated with a shipment of samples is maintained in the appropriate client files.

The ***sample receipt custodian*** is responsible for the inspection of shipping containers upon laboratory receipt for overall integrity and to ensure that the contents have not been altered or tampered with during transit. If tampering is apparent, the sample receipt custodian immediately contacts the assigned ***project manager*** who is responsible for client notification. A sample custody excursion form (Figure 7.5) is filed by the sample receipt custodian, and any corrective action required by the client is documented on the accompanying project chain-of-custody form which is dated and signed by the sample or project manager.

# CONTAINER PREPARATION LOG

| Container Type | Container Size | Container Aperture | Batch Number | Preservative Added | Preservative Lot Number | SL Project Manager | SL Log # | QA Officer | | Corrective Action Report Number |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Accept | Reject | |
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FIGURE 7.3

FIGURE 7.4

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

OFFICIAL SAMPLE SEAL

DATE

TIME

# SAMPLE CUSTODY EXCURSION

SL Project/SDG # _____

| Sample Description | Date Sampled | Date Received | Inappropriate Container | Container Breakage | Container Leakage | Container Label Discrepancy | Custody Seal Not Intact | Other (Client-Specified Excursions) | Initials |
|---|---|---|---|---|---|---|---|---|---|
| 1. | | | | | | | | | |
| 2. | | | | | | | | | |
| 3. | | | | | | | | | |
| 4. | | | | | | | | | |
| 5. | | | | | | | | | |
| 6. | | | | | | | | | |
| 7. | | | | | | | | | |
| 8. | | | | | | | | | |
| 9. | | | | | | | | | |
| 10. | | | | | | | | | |

# CLIENT NOTIFICATION

| SL Contact | Notification Date | Client Contact | Excursion Resolution |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |

FIGURE 7.5

If shipping containers arrive intact, they are immediately opened by the sample receipt custodian in the receiving area, and the chain-of-custody form and temperature container removed for inspection. Container temperature upon receipt is documented in a bound sample registry (Figure 7.6), or if requested by the client, documented on the chain-of-custody form.

7.3.3 Field Custody

When sample collection is performed by SL, Savannah Laboratories' field sampling manager is responsible for ensuring that chain-of-custody procedures for all sampling events are properly documented. The custody forms and login procedures follow the protocol outlined in Section 7.3.

Prior to field sampling, it is preferable to place waterproof sample labels on each sample container and complete each sample label with as much information as possible in waterproof ink. Field sampling technicians are responsible for ensuring that labels are completed. Each sample is identified in the field by a unique alphanumeric designation on the label.

All information included on each container label must be included on all field-generated records including: permanent field notebook, individual well log, groundwater elevation form, and chain-of-custody form. This field documentation demonstrates traceability of the containers and samples and links all ancillary records to specific sampling events.

Each sample is packed to ensure against leakage or breakage and to maintain individual sample integrity. All glass containers are secured individually with bubble wrap. Each set of sample containers with the same sample identity is placed together in plastic bags and sealed. When more than one set of sample containers (different sample identities) are placed in the sample cooler, each set must be sealed in a separate plastic bag. All VOA sample vials are wrapped twice in bubble wrap and each set is sealed in a separate plastic bag. An attempt should be made by the field sampling team to precool samples to 4° C prior to packing the sample coolers for shipment. Cooler temperature is maintained at 4° C in transit by adding sufficient quantities of ice dispersed throughout the cooler. Additional information regarding sampling can be found in Section 6.0.

Ten percent of samples collected by the SL field sampling team will consist of quality control samples for pH, specific conductivity, temperature, or other client specified parameters per site to satisfy DQOs or project requirements.

When applicable to the site, the following information is documented by the field technicians in the bound field notebook. This field documentation is reviewed, approved and initialed by the field sampling manager prior to client submission.

# SL SAMPLE REGISTRY

| SL LOG NO. | CUSTODIAN INITIALS | TIME RECEIVED | DATE RECEIVED | DELIVERED BY | CLIENT ID | AQUEOUS | | | | | | | | | | NONAQUEOUS | | | | | | | | ADDITIONAL SAMPLE INFORMATION | CONTAINER TEMP. | NOTIFY CLIENT | LOGIN COMPUTER | DATE REPORTED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L m/m plastic | L m/m amber glass w/TFE | 500 mL m/m plastic | 500 mL m/m amber glass | 250 mL m/m plastic | 250 mL m/m nalgene | 125 mL m/m amber glass w/TFE | 100 mL m/m plastic | 40 mL vial w/TFE | | L w/m glass | L w/m plastic | 500 mL w/m glass | 500 mL w/m plastic | 250 mL w/m plastic | 125 mL m/m amber glass w/TFE | 100 mL w/m glass | 250 mL m/m glass | | | | | |
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FCU007 02 18 93 2

FIGURE 7.6

Site location
Date/time of sampling
Sample identification (including specific location)
Sample sequence number
Site conditions
Weather conditions
Description of QC samples collected
Names of personnel/visitors
Sampling/purging equipment used
Field analysis data
Field decontamination techniques
Well casing composition and diameter
Drilling/boring method
Drilling well type/name
Water table and well depth
Purge volume calculations
Volume of water purged
Date/time of purging
Analytical data to monitor stabilization of well
Use of fuel powered units
Plumbing/tap material construction
Purging flow rate
Purging time
Flow rate at sample collection
Depth samples taken
Beginning/ending time for composite sampling
Depth soil samples taken
Soil sampling technique used
Type/description of drums
Phases sampled in drums

More complete information is provided regarding sampling procedures and documentation in Section 6.

### 7.3.4 Sample Documentation, Identification, and Login

A sequentially assigned laboratory identification number is assigned by division and recorded on the chain-of-custody form and each sample container submitted with the project and recorded in the bound Sample Registry. Proper and complete sample documentation must be provided on the chain-of-custody form in order to log samples into the sample registry. The sample registry includes all information necessary to maintain chain of custody including laboratory ID, client (field) ID, and initials of the sample receipt custodian. Ancillary information such as sample collection date and requested analyses is transferred directly from the chain-of-custody form into the LIMS, and appears on the client project-specific acknowledgement.

Once the chain of custody is verified, the project identified by this unique number is logged into the computerized LIMS (Figure 12.1) to transfer the desired work order request to the laboratory. The sample receipt custodian checks each sample against the chain-of-custody form for discrepancies between information on the sample label and information

provided on the chain-of-custody form. The sample receipt custodian also inspects all samples for leakage or obvious seal tampering (if provided). All samples are unpacked in a well-ventilated sample receipt area. Personal respirators and face shields are available to each sample receipt staff member for use with any hazardous samples. Samples received in plastic containers which appear to be accumulating or evolving gas are treated cautiously and inspected under a chemical hood because they may contain toxic fumes or be of an explosive nature.

A space labeled "custody intact" provided on the chain-of-custody form is used to describe the sample condition upon receipt. A "Y" indicates no custody problem was identified and a "N" indicates samples or container integrity was compromised and client notification and corrective action is required. At client request, a "Cooler Receipt Form" (Figure 7.7) can be completed to document custodial concerns at sample login.

Discrepancies noted by the custody staff are transmitted to the project and sample manager and are resolved with the client prior to laboratory work assignment. Discrepancies are documented on the sample custody excursion form. The project manager and the sample manager attempt to resolve custody discrepancies expeditiously to avoid holding time compromises. After a decision concerning a sample has been made, the project manager or sample manager makes an initialed note on the original custody form which states person notified, time, date, and resolution, if applicable. This information is also documented on the sample custody excursion form. A faxed or hard copy of custodial resolutions or project order alterations is secured from the client prior to work initiation. Copies of this documentation are mailed to the client and maintained in the client file.

### 7.3.5 Sample Preservation

After addition of the project sequential identification number, the samples are dispersed to the appropriate laboratory section sample storage areas. Color-code dots and unique sample bottle types correspond to specific analysis and are stored at designated sample storage areas throughout the laboratory sections. Bound sample storage temperature logs are maintained for all sample storage refrigerators to assure proper temperature maintenance throughout the analytical process.

The color code scheme for the various preservatives used in SL's sample containers is in the Sample Container Request Form which is submitted to a client requesting sample containers. This two-sided form is shown in Figures 7.8 and 7.9.

All sample containers used by the SL field sampling team contain premeasured portions of preservatives. Additional preservatives are obtained prior to each sampling event from parent stocks assayed and maintained by the laboratory. Documentation is kept for all additional preservatives used in the field. The effectiveness of pH adjustment by addition of acid or base to the samples is checked after sampling by pouring a small amount of the preserved samples into a small specimen cup.

FIGURE 7.7

| COOLER RECEIPT FORM | |
|---|---|
| Client: | Project: |
| SL Log #: | Date Received: |
| SL Cooler Receipt Custodian (Signature): | |

Use other side of this form to note details concerning custodial discrepancies

| | | YES | NO |
|---|---|---|---|
| 1 | Did a shipping slip (air bill, etc.) accompany the cooler shipment? | | |
| 2 | Were custody seals affixed to the outside of cooler? If YES, enter the following: Seal Identification (if provided): | | |
| 3 | Were custody seals unbroken and intact at the date and time of arrival? | | |
| 4 | Were custody papers completed properly (ink, signed, etc.)? | | |
| 5 | Was wet ice/blue ice used? (Circle which media) | | |
| 6 | Cooler temperature upon receipt: | | |
| 7 | Describe type of packing in cooler (vermiculite, bubble pack, etc.). | | |
| 8 | Were sampling containers supplied by SL or client? (Circle which one) | | |
| 9 | Did all bottles arrive intact and were labels in good condition? | | |
| 10 | Did all bottle labels agree with custody papers? | | |
| 11 | Were bubbles present in VOA samples? | | |
| 12 | Was the project manager notified of any custody discrepancies or excursions? | | |
| 13 | Was a custody excursion form completed and a copy provided to the project manager? If so, complete No. 14. | | |
| 14 | Who was contacted?<br><br>By whom:<br><br>Date: | | |

**SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.**

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

Shipping Address: _____

Date of Shipment: 05/19/94

Method of Shipment:

Project Reference:

Project Site Location:

Phone No:

Account No:

## SAMPLE CONTAINER REQUEST FORM

| AQUEOUS | | | | | | | | | | | | | | | NONAQUEOUS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | PRESERVATIVES |
| | | | | | | | | | | | | | | | | | | | | Lab Pk Prep. by: _____<br>Lab Pk Checked by: _____<br>Quantity of Lab Pks. Shipped: _____<br>Proj Mgr: _____<br>Coordinator: _____<br>Comments: _____ |
| | | | | | | | | | | | | | | | | | | | | NO. OF CONTAINERS SHIPPED |
| | | | | | | | | | | | | | | | | | | | | NO. OF CONTAINERS/SAMPLE |
| | | | | | | | | | | | | | | | | | | | | SET(S) OF TRIP BLANKS |
| | | | | | | | | | | | | | | | | | | | | SET(S) OF FIELD BLANKS |
| | | | | | | | | | | | | | | | | | | | | SET(S) OF EQUIPMENT BLANKS |
| | | | | | | | | | | | | | | | | | | | | ANALYSIS |

It is the shipper's responsibility to ensure samples are maintained at the appropriate temperature during transit.

### PRESERVATION COLOR CODE KEY

| | |
|---|---|
| RED(R) | CAUTION! STRONG OXIDIZER! CONTAINS NITRIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water. |
| GREEN(G) | CAUTION! CONTAINS SULFURIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water |
| BLUE(B) | CAUTION! STRONG CAUSTIC! CONTAINS SODIUM HYDROXIDE. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water. |
| ORANGE(O) | No preservatives added. |
| TAN(T) | Contains Zinc Acetate. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water. |
| YELLOW(Y) | Contains Sodium Thiosulfate. Sterilized container. |
| LT.BLUE(LB) | CAUTION! CONTAINS HYDROCHLORIC ACID. Avoid skin and eye contact. If contact is made, FLUSH IMMEDIATELY with water. |

DO NOT inhale vapors that may be caused from a chemical reaction between the preservative and sample. Collect sample in a well-ventilated area or use appropriate breathing apparatus. NEVER RINSE sample containers. If skin contact with preservatives occurs, flush exposed areas IMMEDIATELY.

FIGURE 7.9

## GENERAL SAMPLING INSTRUCTIONS

DO NOT PRE-RINSE CONTAINERS. These containers have been specially prepared for specific analyses (See Preservative Color Code Key). Fill container to within 1" of capacity unless otherwise indicated, cap tightly, label and ice. Some requests require multiple containers to perform all analyses. (See Sample Request Form on reverse side.)

### LITER PLASTIC

| | |
|---|---|
| Orange n/m: | Physical Properties, Miscellaneous General (BOD) |
| Red n/m: | Radiological (Rad 226, Rad 228, alpha and beta) |
| Orange w/m: (Nonaqueous) | Metals and Miscellaneous Inorganics, General, Physical Properties |

### LITER AMBER GLASS

| | |
|---|---|
| Orange n/m: | Extractable Organics (BNAs, Pesticides/PCBs, Herbicides), Dioxins/Dibenzofurans |
| Orange w/m: (Nonaqueous) | All Organics (excluding Volatiles), Inorganics, Physical Properties, General |

### 500 ML PLASTIC

| | |
|---|---|
| Blue n/m: | Cyanide |
| Orange m/m: | Physical Properties, Miscellaneous General |
| Red m/m: | Metals with Mercury |
| Orange w/m: (Nonaqueous) | Inorganics, Physical Properties |

### 500 ML GLASS W/TFE

| | |
|---|---|
| Lt. Blue m/m: | Petroleum Hydrocarbons |
| Green m/m: | Oil and Grease |
| Green m/m (amber): | TOX. Fill to capacity. |
| Orange w/m: (Nonaqueous) | All Organics (excluding Volatiles), Inorganics, Physical Properties, General |

### 250 ML PLASTIC

| | |
|---|---|
| Orange w/m: (Nonaqueous) | Inorganics, Physical Properties, General (single parameter) |
| Orange m/m: | Physical Properties, Inorganics (nutrients), Hexavalent Chromium |
| Red m/m: | Metals without Mercury |
| Green m/m: | Nitrogen series, Phosphorus |
| Tan m/m: | Sulfide |

### 250 ML NALGENE

| | |
|---|---|
| Yellow m/m: | Bacteriological (Coliform, Standard Plate Count) Sterile container - do not touch cap or container interior. Remove faucet strainer and flush line prior to sample collection. |

### 125 ML AMBER GLASS W/TFE

| | |
|---|---|
| Green m/m: | TOC. Fill to capacity. |
| Green n/m: | Total Recoverable Phenolics |
| Orange m/m: (Nonaqueous) | Volatiles. Fill to capacity - no headspace. |

### 100 ML PLASTIC

| | |
|---|---|
| Orange m/m: | Physical Properties, Inorganics (single parameter) |
| Green m/m: | Nutrients, COD (single parameter) |

### 100 ML GLASS

| | |
|---|---|
| Orange w/m: (nonaqueous): | Organics, Inorganics, Physical Properties, General (single parameter) |

### 40 ML GLASS VIAL W/TFE

| | |
|---|---|
| Lt. Blue n/m: | Volatiles (Aromatics and/or Halogenated constituents). Fill vials until slightly overflowing with minimum aeration. Place septa W/TFE liner facing sample and seal with NO headspace. |
| Orange n/m: | EDB, Volatile Halocarbons. Fill as referenced above. |
| Yellow n/m: | Trihalomethanes (THM). Fill as referenced above. |

### 250 ML GLASS

| | |
|---|---|
| Orange w/m: (nonaqueous): | Physical Properties, Inorganics (single parameter) |

*Container Closure Key (n/m = narrow mouth, m/m = medium mouth, w/m = widemouth)*

## CONTAINER SHIPPING INSTRUCTIONS

*After sample collection, please check all custody forms and sample containers for discrepancies. Sign the custody form and seal in the enclosed* plastic bag. To avoid container leakage during transit, additional plastic bags have been included in the shipment to contain ice for sample preservation. Please place these ice bags between the samples and secure the lab pack for shipment. Return lab packs to Savannah Laboratories & Environmental Services, Inc., 5102 LaRoche Avenue, Savannah, GA 31404. *If you have any questions concerning containers shipped or* acceptable field substitution, please contact your project manager or sample coordinator for assistance at (912) 354-7858 or FAX (912) 352-0165.

Thank you for your patronage.

and testing with narrow range pH paper. Because of the risk of compromising sample integrity, VOA samples cannot be checked in the field.

All samples received by Savannah Laboratories are checked for proper pH adjustment by the appropriate preparation or analytical department as soon after receipt as possible. The pH of each sample is checked, documented, and adjusted, if necessary. To avoid compromising sample integrity, volatile samples are checked for proper pH adjustment only at the time of analysis. The pH of volatile samples is not adjusted.

7.3.6 Sample Security, Accessibility, Distribution, and Tracking

Only authorized personnel are permitted within the laboratory areas where sample access is possible. Sample storage areas are designed to segregate volatile and nonvolatile samples. Standards and extracts are also departmentally controlled and stored in segregated facilities.

The set of analyses required for a group of samples is project-dependent. After sample registry login and verification, samples are relinquished from the receiving area to the appropriate sample preparation area. Those samples not requiring preparation are relinquished immediately to the sample analysis storage area. Using LIMS-generated sample preparation worksheets for guidance, samples are extracted, digested, or distilled as appropriate. An example sample preparation log (Fluoride Extraction Log) is shown in Figure 7.10. The extracts, digestates, or distillates are then transferred and relinquished to the appropriate analysis section, where analysis is performed. An example analysis log (Fluoride Analysis) is shown in Figure 7.11.

For projects where in-laboratory custody records are required by the client, the SL project manager should inform the custodian and sample manager to coordinate custody activities prior to sample receipt. For those samples, department-specific in-laboratory sample tracking forms are executed by department staff. An example of a form of this type (Semivolatile Extract Custody Log) is shown in Figure 7.12. Samples and sample preparations are stored in a secure (locked) sample storage area. When samples or sample preparations are removed from or returned to designated storage areas, the form is signed and dated by the analyst.

Sample holding times are tracked via the LIMS. Sample collection dates are routinely entered into the LIMS with all sample logins. This information allows holding times specific to each departmental analysis to be tracked by department managers, supervisors, chemists, and analysts through the use of daily status sheets, reference sheets, and preparation worksheets. Date analyzed is recorded via instrument outputs or analysis forms when applicable as an integral part of the raw data. Upon the analysis of each parameter, the date of analysis is entered into the LIMS and can be compared to the date sampled to validate that holding times have not been compromised.

FIGURE 7.10

## FLUORIDE EXTRACTION LOG

Batch No. _____ Spike Level _____ Final Volume _____

| Date | Analyst | SL Log No. | Sample Description | Wet Weight |
|---|---|---|---|---|
| | | | | |
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# FLUORIDE

Method 340.2

| CALIBRATION CURVE | | |
|---|---|---|
| mg/L | Log (mg/L) | mV |
| 0.1 | -1 | |
| 0.3 | -0.522 | |
| 1 | 0 | |
| 2 | 0.301 | |
| 3 | 0.477 | |
| 10 | 1 | |
| 20 | 1.30 | |

| | |
|---|---|
| Date: | |
| Analyst: | |
| Batch #: | |
| Correlation Coefficient: | |
| QC Check True Value: | |
| Spike Level: | |

| # | SL Log No. | Sample Description | Sample Dilution | Volume or Wet Weight | Sample Potential (mL) | Result (mg/L) | Dry Weight | Result (mg/kg) | % REC | % RPD |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
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FIGURE 7.11

# SEMIVOLATILE EXTRACT CUSTODY LOG

| QE # | Total # of Extracts | Box ID | Analysis Required | Date Complete (Final Proj Chk) | Date Relinquished from Extraction Department | | Date Received | | Instrument Group | Date Disposed |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Int | Date | Int | Date | | |
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FIGURE 7.12

### 7.3.7 Sample Disposition

After analysis completion, custody of unused sample portions, extracts, or digests is relinquished to the central secured storage area. Unless a client requests the project manager to save unused samples, digests, or extracts, disposal from the central storage occurs as soon as holding times have expired or three weeks after results submission.

Requests for extended sample, digest or extract storage must be provided by the client to the SL project manager in writing (or contract form) prior to sample receipt and extended storage may result in additional fees to be negotiated by the SL project manager prior to sample receipt. SL is not responsible for evaporation or other deterioration of samples, extracts, or digests during extended storage periods.

Samples which are requested to be returned to the client may be picked up at the laboratory by the client, shipped by Federal Express (at the client's expense for packaged shipping) or returned by any other legal means that is arranged by the client. Clients requesting the return of samples should provide detailed shipping instructions.

If a client by contract requires that samples be disposed of by a hazardous waste contractor, the client's name and EPA ID number are used on the manifest and the client is billed for all disposal related costs.

Other excess sample portions will be composited according to matrix (solids, oils or aqueous) by the laboratory. The composited soils, sediments and other solid samples are subsampled and analyzed for hazardous waste characterization: ignitability, reactivity, (releasable cyanide and sulfide), corrosivity (pH), toxicity (TCLP by SW-846 Method 1311) and PCBs. If the pooled subsample is hazardous by any of the hazardous waste characteristics or contains greater than 50 ppm PCBs, the composited excess sample is disposed of by a hazardous waste contractor. If the pooled subsample is not deemed hazardous per these tests, the composited excess material is disposed of in an industrial/municipal landfill.

Since previous analyses by Savannah Laboratories have indicated that composite excess aqueous sample meets the public sewer system discharge criteria in 40 CFR Part 261.3(a)(2)(iv)(E), composited aqueous samples are neutralized to pH 6-8 and discharged into the public sewer system which receives the laboratory's wastewater provided the results from the tests performed on the sample do not indicate that the sample exceeds hazardous characteristics as stated in 40 CFR Part 262, Subpart C.

The laboratory tracks sample disposal via the LIMS. The LIMS keeps track of clients' specific disposal instructions, compiles results from the analyses of composited samples, prepares sample disposal lists, invoices for disposal and sample return costs, and provides a disposal record for all excess samples.

### 7.3.8 Interdivisional Custody

The laboratory director at each location monitors the sample load and turnaround time through LIMS-generated reports. If it appears that analysis demand will exceed capacity, or if instrument failure occurs, samples may be transferred (provided client contracts or arrangements, project QA plans or certification limitations do not prohibit sample transfer) to another SL division to ensure that holding times and turnaround commitments are met.

If samples are transferred to another division laboratory, full custody is maintained. Special determination codes specific to each laboratory location are entered into the LIMS to enable the project manager and laboratory director to track sample progress and maintain chain of custody. Copies of the original chain-of-custody form (executed for interdivisional sample submittal), computerized LIMS work order acknowledgements, and extract or digest preparation logs pertinent to the project order accompany the samples or sample preparations. The accompanying documentation also includes dates of sample preparation and requested analyses. Upon sample receipt at the receiving division laboratory, standard custody procedures are followed.

## 7.4 Electronic Data Records

By careful assignment of user passwords and file access/lock codes, Savannah Laboratories maintains a high level of data security for the LIMS. Thus, only authorized SL personnel can access client files to view data. In addition, data entry and editing is restricted to highly trained data management personnel.

Data may be downloaded in a variety of standard formats including ASCII, Spreadsheet, Database, or Text files such as *.ASC, *.WK1, *.DBF, *.TXT, etc. Additionally, lab data may be formatted to match client-specific requirements. These requirements should be defined and agreed upon prior to project commencement. Laboratory-generated data are thoroughly reviewed prior to preparation of electronic or diskette deliverables. The download process includes both electronic and logical error check routines to confirm the data files delivered are consistent with the client's format and data content request. A signed hardcopy report will be provided with all electronic or diskette deliverables and an electronic and documentation audit trail of each download event will be maintained.

In order to ensure data integrity and security, all files selected for data downloads are transferred from the LIMS to an isolated PC computer system. Access to download files is then controlled via required matches of log-on sequences and confidential passwords. The entire download process is regularly reviewed and maintained by the computer department for system performance.

Internal documentation is maintained by the LIMS manager for all LIMS programs. This documentation includes descriptions of any program additions, deletions, or modifications, the date of revision, and the initials of the responsible programmer. To verify proper program

functioning of the hardware and software, a simulation account is maintained. When hardware or software is modified, the LIMS uses actual data in the simulation account in order to verify the modifications are functioning as anticipated. Antivirus software serves the LIMS as a protective measure.

At present, laboratory instrumentation is not interfaced directly to the LIMS and thus, no instrument-LIMS data transfer step requires verification. All instrument data is verified by chemists or analysts as described in Section 12.5.2.

Entry of data into the LIMS from chemists' worksheets is routinely performed by data entry technicians. Immediately following data entry, approval sheets are printed with the entered data as it appears in the LIMS. Assistant project managers compare all data on the approval sheets against the chemists' worksheets for data transcription errors.

## 7.5 Verification of Hard Copy Records

Data worksheets, data approval forms, and final reports are routinely printed for verification and signatures. Hard copies of final reports, field data, chain-of-custody forms, and any ancillary documentation pertinent to the project will be stored in a secured storage area and placed chronologically within alphabetically arranged client files.

## 8.0 ANALYTICAL PROCEDURES

The ultimate responsibility for analytical method selection lies with the client or regulatory agencies. Whenever possible, laboratory and field analysis of all samples are conducted by EPA-approved methodology. When EPA approved methods do not exist or project protocols require alternative methods, these methods must be approved by the client and the appropriate regulatory agency.

Tables 5.1 and 5.2 list Savannah Laboratories' routine laboratory parameters with their respective method numbers. Table 5.3 lists field parameters with their respective method numbers.

A detailed SOP has been prepared for each routine analytical method. Copies of SOPs are issued under document control procedures to each staff member involved with the procedure. A master copy of each SOP is maintained by the QA manager.

In cases where GC, LC, or GC/MS methods are used to determine compounds not included in the actual method list, these unlisted parameters are flagged in the tables with a triple asterisk (***) and method validation data are included in Appendix A.

For those cases where no specific soil or sediment method exists, water methods are adapted. These adaptations are described in Section 8.2, and validation data are presented in Appendix A. Unless indicated in the appropriate SOP, all parameters listed in Tables 5.1 through 5.3 are analyzed by the methods referenced, without modifications. Interpretation of ambiguous or conflicting method requirements is accomplished by consulting with regulatory agencies and EPA laboratory/QA personnel.

### 8.1 Glassware Cleaning Procedures

Laboratory glassware washing procedures are adapted from SW-846, *40 CFR Part 136, Standard Methods*, and EPA 600/4-79-019, and are as follows:

<u>Extractable Organics</u>

Prerinse each item with the solvent to be used in it. As soon as possible after use, rinse with lab-grade acetone. Wash with hot water and a nonphosphate detergent such as Alconox, scrubbing thoroughly with a brush. Rinse thoroughly with tap water at least three times. Rinse inside surface with Nochromix solution, catching rinsate for re-use. Rinse again with tap water, followed by pesticide-grade acetone. Rinsing with hexane is avoided to minimize the possibility of contamination of glassware used for total petroleum hydrocarbon determination. Air dry when possible, and do not bake Class A volumetric glassware. Store glassware inverted or cap openings with foil to exclude dust and other contaminants. Because of possible damage, caps, septa, and plastic items are not rinsed with Nochromix.

Volatile Organics

Wash with tap water and Alconox or Liquinox, then rinse thoroughly with organic free water. Oven dry at 110°- 120°C for at least two hours. Do not bake Class A volumetric glassware. Glassware is usually stored in the oven until use. Caps and septa are washed in the same manner, but caps are not oven-dried. Highly contaminated glassware is allowed to soak in Nochromix solution overnight, then washed as above.

General Chemistry, Microbiology, Nutrients, Demands

Wash with hot tap water and Liquinox, rinse thoroughly with tap and deionized water, and air dry. Store glassware inverted or cap openings with foil. Autoclave bacteriological laboratory glassware and collection bottles as described in analytical procedures. COD digestion tubes and caps are cleaned with brushing and tap water (no soap) and rinsed thoroughly with deionized water. Tubes for TKN and total phosphorus sample digestions are washed with hot water and Liquinox, and rinsed with tap water, Nochromix, and deionized water.

Metals/Radionuclides

Wash glass, plastic, and Teflon items in hot tap water and Alconox. Rinse with tap water, 1:1 nitric acid, tap water, and deionized water. Teflon beakers used for sample digestion are further decontaminated by adding 20 mL nitric acid and 12 mL hydrochloric acid, covering with a watch glass, and digesting on a hot plate for two hours. Following this treatment, they are rinsed with 10% nitric acid and deionized water and allowed to air dry.

## 8.2 Soil Sample Preparation Notes

In the absence of an approved soil method, water methods are adapted for soil matrices. The following soil preparation procedures are applied to parameters in Table 5.2.

1. Fluoride (extractable): Method 340.2

Approximately 5 g of sample is weighed out exactly and placed in a screw-cap plastic bottle. One hundred mL of DI water is added to the sample, the bottle is capped, placed in a rotating extractor, and rotated for 2 hours. Upon removal, the sample is allowed to settle, the supernatant decanted, and the extract is analyzed as a liquid sample.

2. Gross Alpha and Gross Beta Particle Activity: Method 9310

Soil is ground to a fine powder with mortar and pestle, and 50 to 100 mg soil is weighed onto a tared planchet. Sample is distributed evenly over planchet surface, fixed with clear acrylic solution, dried, and counted.

3. Chloride (extractable): Method 9251/9252/4500-$Cl^-$C

Approximately 5 g of sample is weighed out exactly and placed in a screw-cap plastic bottle. One hundred mL of DI water is added to the sample,

the bottle is capped, placed in a rotating extractor, and rotated for 2 hours. Upon removal, the sample is allowed to settle and the supernatant is decanted. The extract is analyzed as a liquid sample.

4. Sulfate (extractable): Method 9036/9038/375.3

Approximately 5 g of sample is weighed out exactly and placed in a 100-mL screw-cap plastic bottle. One hundred mL of DI water is added to the sample, the bottle is capped, placed in a rotating extractor, and rotated for 2 hours. Upon removal, the extract is filtered using a syringe filter with a 0.20-um pore size filter and analyzed as a liquid sample.

5. Orthophosphate (extractable): Method 365.1

Approximately 5 g of sample is weighed out exactly and placed in a screw-cap plastic bottle. One hundred mL of DI water is added to the sample, the bottle is capped and placed in a rotating extractor, and rotated for 2 hours. Upon removal, the sample is allowed to settle and the supernatant is decanted. The extract is analyzed as a liquid sample.

## 8.3 Validated Compounds and Modifications of Referenced Analytical Methods

Except for the instances described below, parameters in Tables 5.1 and 5.2 have been determined by the methods referenced with no significant modification to those methods, other than the use of additional standards for parameters not included in the referenced method lists.

*Extractable Petroleum Products*

Extractable petroleum products are determined by the modified 8100 method. In this procedure, the semivolatile products are extracted from the samples with methylene chloride. The extract is injected into a GC equipped with an FID detector and the oven is programmed to effect separation of the component compounds on the column. The identification of a petroleum product is made by comparison of the standard chromatogram against the sample chromatogram, using pattern recognition techniques.

*Purgeable Petroleum Products*

Purgeable petroleum products are determined by the modified 8015 method. In this procedure, the volatile products are purged from the sample by helium gas. The VOCs are then collected on a sorbent trap. When the adsorption is complete, the sorbent trap is heated and then backflushed with helium to desorb the collected analytes onto the GC column. The oven is temperature programmed to effect separation of the component compounds on the column and the detector is an FID. The identification of a petroleum product is made by comparison of the standard chromatogram against the sample chromatogram, utilizing pattern recognition techniques.

*Method 8015 - DAI*

Method 8015 allows for the determination of compounds by direct aqueous injection (DAI). In this procedure, compounds are determined on a GC

using a flame ionization detector. Soils and other solid matrixes are first extracted into an equal part of reagent water prior to analysis.

The identification of a compound is based upon comparison of the retention time of the suspect peak with that of the standard. Confirmations may be done upon request by client and involve analysis of the sample utilizing a dissimilar column or gas chromatography/mass spectroscopy (GC/MS).

*Sulfide*

In the determination of sulfide in liquid samples containing turbidity or color and in all soil or sediment samples, samples are distilled as per SW-846 method 9030. Upon distillation of the sample, the trapping solution is analyzed colorimetrically as a clear liquid sample as per EPA method 376.2.

*Asulam*

Water samples are analyzed by passing them through a solid phase cartridge and then acidifying with concentrated $H_3PO_4$. The sample is then injected directly into the HPLC system. The HPLC system consists of an isocratic pump and a UV detector.

*Thiodiglycol*

Water samples are analyzed by passing them through a solid phase cartridge. Soil samples are extracted by sonication with calcium chloride solution and then processed through the same cleanup as the water samples. The samples are injected into the HPLC system which consists of an isocratic pump and a UV detector.

*Ethylenethiourea*

Water samples are extracted 1:1 with methylene chloride to remove nonpolar interferences. The extracted water layer is then forced through a solid phase extraction column to remove polar interferences. Ethylenethiourea is determined in the prepared sample by HPLC, using a five-point calibration curve and the external standard technique.

## 8.4 Reagent Storage and Documentation

Reagents are stored with consideration for safety and maximum shelf life. Storage conditions for various classes of reagents are given in Table 8.1, as well as discussed below. Documentation maintenance status for the reagent classes is also given in Table 8.1.

All acids, except those poured up in small marked containers which are for immediate use, are stored in the original containers in acid storage cabinets.

All bases, except those poured up in small containers for immediate use and those that are standardized for specific purposes, are stored in the original containers in designated areas or storage cabinets.

**TABLE 8.1**

REAGENT STORAGE

| Chemical | Method of Storage | Documentation |
|---|---|---|
| Acids | Original containers in acid storage cabinets | Yes |
| Bases | Original containers in designated storage cabinets | Yes |
| Nonflammable Organic Solvents | Original containers in designated storage cabinets | Yes |
| Flammable Solvents | Original containers in vented flammable storage cabinets | Yes |
| Dry Reagents | Original containers in designated cool, dry storage cabinets | Yes |
| Reactive Chemicals | Original containers in isolated cool, dry storage cabinets | Yes |

All flammable solvents, except those poured up for immediate use are stored in original containers in approved vented flammable storage cabinets which are located in air conditioned areas.

Dry reagents are stored in designated cabinets in cool, dry areas. Reactive chemicals, cyanides and sulfides are labeled and isolated from other chemicals.

All acids used for metal sample digestions and all solvents used for semivolatile sample extraction are tested prior to initial use. Specific acceptable chemical lots are reserved and stored by the vendor(s) and are requisitioned and received as needed by the laboratory. Lot numbers used for digestions or extractions are recorded in bound notebooks in the appropriate departments.

Reagent blanks are analyzed with each sample batch for all methods, validating the purity of all reagents. All reagent containers are dated when received, and dated and initialed when opened (except high use items consumed in less than one week). Documentation is maintained to provide traceability of the reagents used with the analysis of any batch to specific reagent lot numbers.

## 8.5 Waste Disposal

Savannah Laboratories' divisions operate as either conditionally exempt small quantity generators or small quantity generators of hazardous waste.

All waste disposal is carried out in accordance to Savannah Laboratories' Waste Disposal SOP. This document includes procedures for identification, storage, personnel training, tracking forms, report forms, safety, as well as details of the disposal. Hazardous waste disposal procedures are given in Table 8.2 and discussed below.

Hazardous wastes must:

-- be stored in non-leaking containers in good condition with close-fitting lids and kept closed when wastes are not being added or removed.

-- be accurately labeled with waterproof labels. Labels must specify the words "Hazardous Waste", the composition and physical state of the waste, the hazardous properties of the waste (e.g., flammable, reactive, etc.), and the name and address of the generator.

-- be clearly labeled on each container with the date that the period of accumulation began. The date must also be documented on the Hazardous Waste Tracking Log Form.

-- be handled in containers and in a way that minimizes the possibility of spills and escape of wastes into the environment.

-- be stored in an area which is regularly inspected for deteriorating or leaking containers.

## TABLE 8.2

### WASTE DISPOSAL PROCEDURES

| Waste Type | Associated Analytical and Sample Prep Methods | Storage Procedures | Disposal Procedures |
|---|---|---|---|
| Halogenated Solvents Methylene Chloride | Pesticides, Herbicides, BNA, GPC, etc. | Store in glass bottles, then in drums.** | Reclaimed by HW contractor |
| Freon | Oil & Grease, Petroleum Hydrocarbons | Store in glass bottles, then in drums | Reclaimed by laboratory |
| Mixed Solvents (Flammable & nonhalogenated) | VOC Standards, Herbicides, Pesticides | Store in glass bottles, then in drums | Disposal by HW contractor |
| All neat standards | All analyses | Store in original bottles of glass/ plastic bottles, then lab pak | Disposal by HW contractor (Packed by also) |
| Heavy Metals Solutions | Metals, COD, Chloride | Store in glass bottles, then in drums | Disposal by HW contractor |
| Acid Solutions | Metals, General Inorganics, Extractions | Store in glass bottles or add to neutralizing chambers | Neutralize; sanitary sewer |
| Alkaline Solutions | General Inorganics, Extractions | Store in glass bottles | Neutralize, sanitary sewer |
| All samples containing Organics or Inorganics exceeding hazardous waste standards* | All analytical groups | Store in original bottles or jars in sample custody storage area | Return to client, or disposal by HW contractor |

* Hazardous Waste Characteristics (D001 - D017) (40 CFR Part 261), HCN > 250 mg/kg, $H_2S$ > 500 mg/kg, TCLP Toxicity Characteristics (Federal Register, 55FR 11798), March 29, 1990, or contains greater than 50 ppm PCBs.

** Bottles are kept in each lab and are periodically moved by the Waste Coordinator to hazardous waste storage area.

All waste must be segregated for temporary accumulation and storage as well as for disposal. Care must be taken to combine waste materials into categories or waste streams based upon their compatibility.

The following three types of waste are stored in 55-gallon drums.

1. Halogenated solvents such as methylene chloride (closed cap metal drum)

2. Nonhalogenated flammable solvents (closed cap metal drum)

3. Heavy metals or other aqueous wastes except cyanide (poly drum)

All other wastes should be stored in the original container or 4-liter glass bottles and disposed of via lab pak. (Packed by disposal company in 55-gallon open top drums.)

# 9.0 CALIBRATION PROCEDURES AND FREQUENCY

## 9.1 Laboratory Equipment

Savannah Laboratories is equipped with state-of-the-art instrumentation to provide quality analytical data to clients. A list of the instrumentation maintained by Savannah Laboratories for the determination of the parameters contained in Tables 5.1 and 5.2 is found in Table 9.1. A list of all field instrumentation maintained by the laboratory is contained in Table 9.2.

## 9.2 Standard Receipt and Traceability

Standards are purchased from commercial sources in mixes designed for the specific methods or as neat compounds. Certificates of analysis are shipped with each ampule by the vendor. When possible, standards are certified to meet or exceed the criteria established by the U.S. EPA or are traceable to NIST standards.

Upon receipt, dates are placed on all standard materials. Standard logbooks are maintained by all sections of the laboratory to document the traceability of working standards back to neat materials or prepared stock mixes. All standards are assigned a lot number that provides a unique identification as well as identifying the type of standard. This unique lot number is documented in a laboratory notebook along with date of preparation, initials of preparer, concentration, expiration date (if applicable), and solvent (if applicable). If required, a standard preparation narrative is also provided in this notebook to detail the preparation steps for each stock standard.

## 9.3 Standard Sources and Preparation

Savannah Laboratories maintains an inventory of materials to produce stock standards or purchases stock standards from commercial vendors. Laboratory preparation of all lab-prepared stock, intermediate, and working standards is documented by the responsible analysts. Table 9.3 presents standard sources and preparation protocols for various sections of the laboratory. Field instruments requiring calibration standards (conductivity meters and pH meters) use the same sources as laboratory instrumentation.

Table 9.4 lists titrants used by the laboratory and information regarding their standardization.

## 9.4 Laboratory Instrument Calibration

The calibration procedures given below meet or exceed EPA method requirements.

Calibration requirements specified by the method which are more stringent than these procedures will be used.

TABLE 9.1

MAJOR LABORATORY INSTRUMENTS AT EACH SAVANNAH LABORATORIES LOCATION

| # | Instrument | Deerfield Beach | Tallahassee | Savannah | Mobile | Tampa Bay | New Orleans |
|---|---|---|---|---|---|---|---|
| 9 | ICP Units | 1-Jarrell Ash 61 | 1-Jarrell Ash 61 | 1-Jarrell Ash 61<br>1-Jarrell Ash Enviro 36<br>1-Jarrell Ash 61E Trace | 1-Jarrell Ash 61E<br>1-Perkin Elmer 6000 | 1-Jarrell Ash 61E | 1-Jarrell Ash 61E |
| 6 | Mercury Cold Vapor Units | 1-Varian VGA/AA20 | 1-Varian VGA-76/AA20 | 1-Varian VGA-76/AA20 | 1-Perkin Elmer MAS/6000 | 1-Coleman 50B | 1-Coleman 50B |
| 15 | Atomic Absorption Furnace/Flame | 2-Varian 400Z | 2-Varian 400Z<br>1-Varian AA 20 | 1-Varian 400Z<br>2-Jarrell Ash 4000<br>1-Jarrell Ash 22<br>1-Perkin Elmer 2380 | 1-Varian 400Z<br>1-Perkin Elmer 5000 | 1-Varian 400Z<br>1-Varian AA 20 | 1-Varian 600Z |
| 14 | GC/MS Semivolatiles | 1-HP 5970 | 3-HP 5970 | 4-HP 5970<br>1-HP 5971<br>1-HP 5972 | 1-Varian Saturn 3<br>1-HP 5970 | 1-HP 5971 | 1-HP 5972 |
| 15 | GC/MS Volatiles | 1-HP 5970 | 3-HP 5970 | 3-HP 5970<br>2-HP 5971<br>2-HP 5972 | 1-HP 5970<br>1-HP 5972 | 1-HP 5971 | 1-HP 5970 |
| 39 | Gas Chromatography Semivolatiles | 3-Varian 3400 with dual ECD<br>3-Varian 3400 with dual FID<br>1-Varian 3700 with FID | 1-Varian 3400 with dual NPD<br>2-Varian 3400 with dual FID<br>4-Varian 3400 with dual ECD<br>1-Shimadzu 9AM with dual ECD<br>1-HP 5880 with FID | 1-Varian 3400 with dual FID<br>1-Varian 3400 with dual NPD<br>2-Varian 3400 with dual ECD<br>2-Varian 3700 with dual ECD<br>1-Varian 3700 with ECD<br>2-HP 5890 with dual ECD<br>1-HP 5890 with dual FID<br>1-Varian 3600 with dual FID | 4-Varian 3400 with dual ECD<br>1-Varian 3400 with FID<br>1-Varian 3300 with dual NPD | 2-Varian 3400 with dual ECD<br>2-Varian 3400 with dual FID<br>1-Varian 3600 with dual ECD | 1-HP 5890 with dual ECD<br>1-Varian 3400 with dual FID |

TABLE 9.1

MAJOR LABORATORY INSTRUMENTS AT EACH SAVANNAH LABORATORIES LOCATION

| # | Instrument | Deerfield Beach | Tallahassee | Savannah | Mobile | Tampa Bay | New Orleans |
|---|---|---|---|---|---|---|---|
| 9 | ICP Units | 1-Jarrell Ash 61 | 1-Jarrell Ash 61 | 1-Jarrell Ash 61<br>1-Jarrell Ash Enviro 36<br>1-Jarrell Ash 61E Trace | 1-Jarrell Ash 61E<br>1-Perkin Elmer 6000 | 1-Jarrell Ash 61E | 1-Jarrell Ash 61E |
| 6 | Mercury Cold Vapor Units | 1-Varian VGA/AA20 | 1-Varian VGA-76/AA20 | 1-Varian VGA-76/AA20 | 1-Perkin Elmer MAS/6000 | 1-Coleman 50B | 1-Coleman 50B |
| 15 | Atomic Absorption Furnace/Flame | 2-Varian 400Z | 2-Varian 400Z<br>1-Varian AA 20 | 1-Varian 400Z<br>2-Jarrell Ash 4000<br>1-Jarrell Ash 22<br>1-Perkin Elmer 2380 | 1-Varian 400Z<br>1-Perkin Elmer 5000 | 1-Varian 400Z<br>1-Varian AA 20 | 1-Varian 600Z |
| 14 | GC/MS Semivolatiles | 1-HP 5970 | 3-HP 5970 | 4-HP 5970<br>1-HP 5971<br>1-HP 5972 | 1-Varian Saturn 3<br>1-HP 5970 | 1-HP 5971 | 1-HP 5972 |
| 15 | GC/MS Volatiles | 1-HP 5970 | 3-HP 5970 | 3-HP 5970<br>2-HP 5971<br>2-HP 5972 | 1-HP 5970<br>1-HP 5972 | 1-HP 5971 | 1-HP 5970 |
| 41 | Gas Chromatography Semivolatiles | 3-Varian 3400 with dual ECD<br>3-Varian 3400 with dual FID<br>1-Varian 3700 with FID | 1-Varian 3400 with dual NPD<br>2-Varian 3400 with dual FID<br>4-Varian 3400 with dual ECD<br>1-Shimadzu 9AM with dual ECD<br>1-HP 5880 with FID | 1-Varian 3400 with dual FID<br>1-Varian 3400 with quad FID<br>1-Varian 3400 with dual NPD<br>2-Varian 3400 with dual ECD<br>2-Varian 3700 with dual ECD<br>1-Varian 3700 with ECD<br>2-HP 5890 with dual ECD<br>1-HP 5890 with dual FID<br>1-Varian 3300 with dual ECD | 4-Varian 3400 with dual ECD<br>1-Varian 3400 with FID<br>1-Varian 3300 with dual NPD | 2-Varian 3400 with dual ECD<br>2-Varian 3400 with dual FID<br>1-Varian 3600 with dual ECD | 1-HP 5890 with dual ECD<br>1-Varian 3400 with dual FID |

TABLE 9.1

MAJOR LABORATORY INSTRUMENTS AT EACH SAVANNAH LABORATORIES LOCATION

| # | Instrument | Deerfield Beach | Tallahassee | Savannah | Mobile | Tampa Bay | New Orleans |
|---|---|---|---|---|---|---|---|
| 34 | Gas Chromatography Volatiles/P&T | 1-Varian 3600 with PID/Hall<br>2-Varian 3300 with PID/Hall<br>1-Varian 3300 with PID/FID<br>1-Varian 3300 with FID/Hall<br>1-Varian 3400 with PID/Hall | 1-Varian 3400 with PID/FID<br>1-Varian 3700 with Hall/FID<br>1-Varian 3300 with Hall/FID<br>1-Varian 3300 with PID/Hall<br>1-Varian 3300 with PID/FID<br>1-Varian 3400 with PID/Hall<br>1-Varian 3600 with PID/Hall | 1-Varian 3600 with FID/FID/TCD<br>1-Varian 3700 with Hall/PID<br>1-Varian 3600 with Hall/PID/FID<br>2-Varian 3400 with PID/FID<br>2-Varian 3300 with Hall/FID<br>1-Varian 3700 with Hall/FID<br>1-HP 5890 with dual FID<br>1-Varian 3400 with dual FID<br>1-HP 5890 with FID and Tekmar 7000 | 1-Varian 3300 with Hall/FID<br>1-Varian 3300 with Hall/PID<br>1-Varian 3400 with PID/FID | 1-Varian 3300 with FID/Hall<br>1-Tracor 540 with PID/Hall<br>1-Varian 3600 with PID/Hall<br>1-Varian 3400 with FID/PID<br>1-Varian 3400 with PID/Hall | 1-Varian 3400 with PID/Hall<br>1-Varian 3400 with PID/FID |
| 2 | TOC Analyzers | | | 1-Dohrmann DC80 | 1-OI 524C | | |
| 6 | IR Spectrophotometers | 1-Buck Scientific HC-404 | 1-Buck Scientific HC-404 | 1-Buck Scientific HC-404 | 1-Buck Scientific HC-404 | 1-Buck Scientific HC-404 | 1-Buck Scientific HC-404 |
| 8 | UV-VIS Spectrophotometers | 1-Milton Roy 21 | 1-Milton Roy 301<br>1-B&L 21 | 1-Milton Roy 301<br>1-Perkin Elmer 35 | 1-Sequoia Turner 340 | 1-Milton Roy 301 | 1-Milton Roy 301 |
| 4 | Nutrient Autoanalyzers | | | 3-Technicon Traacs 800 | 1-Lachat Quickchem AE | | |
| 5 | HPLC Units | | 1-Waters 486<br>1-Waters 484<br>1-Kratos 980<br>1-Waters 490E<br>1-Waters 470 | | 1-Waters 712<br>1-Waters 470 | | |
| 1 | Alpha/Beta Counter | | | | | 1-Tennelec LB 5100 | |
| 2 | Radon Flask Counter/Scaler | | | | | 2-Ludlum Measurements 182/2000 | |

TABLE 9.1

MAJOR LABORATORY INSTRUMENTS AT EACH SAVANNAH LABORATORIES LOCATION

| # | Instrument | Deerfield Beach | Tallahassee | Savannah | Mobile | Tampa Bay | New Orleans |
|---|---|---|---|---|---|---|---|
| 10 | BOD Incubator | 2-Westinghouse 16.8 | 1-Precision 815 | 1-Lab Line<br>2-Precision Lo-Temp | 1-Fisher Isotemp<br>1-Precision Lo-Temp | 1-Fisher 307 | 1-Fisher 307 |
| 31 | Drying Oven | 4-Fisher Isotemp 500<br>1-Tempcon | 2-VWR 1305 U<br>1-Fisher Isotemp 500<br>3-Blue M<br>1-Fisher Isotemp 655G<br>2-Tempcon | 4-Fisher Isotemp 500<br>1-Tempcon HB620-1 | 3-Blue M<br>1-Precision Scientific<br>2-Fisher Isotemp | 3-VWR 1305U | 3-VWR 1305U |
| 10 | Block Digestor | 2-Hach | 1-Thermolyne Dri-Bath | 2-Technicon BD-40<br>1-Thermolyne Dri-Bath<br>1-Lab Line Multiblank 2093 | 1-Technicon Dri-Block DB-3B<br>1-Lachat BD-46 | 1-Thermolyne | |
| 6 | TCLP (nonvolatile) | Custom | Custom | 2-Custom | Custom | Custom | Custom |
| 3 | TCLP (ZHE) | | 1-ATCS ZHE | 2-ATCS ZHE | 1-ATCS ZHE | | |
| 3 | Ignitability Apparatus (Pensky-Martens) | 1-Kochler | 1-Koehler K-16200 | 1-Koehler K-162 | 1-Koehler K-162 | | |
| 3 | Gel Permeation Chromatograph | | 2-ABC SP 1000 | 1-Benchmate GPC | | | |
| 13 | Sample Concentrator | 2-Zymark TurboVapII | 2-Zymark TurboVapII | 4-Zymark TurboVapII | 2-Zymark TurboVapII | 2-Zymark TurboVapII | 1-Zymark TurboVapII |

## TABLE 9.2

### MAJOR FIELD INSTRUMENTS AT EACH SAVANNAH LABORATORIES LOCATION

| # | Instrument | Deerfield Beach | Tallahassee | Savannah | Mobile | Tampa Bay | New Orleans |
|---|---|---|---|---|---|---|---|
| 5 | pH/SC/DO/T° Meters | 1-Corning Checkmate 90 | 1-Corning Checkmate 90 | 1-Corning Checkmate 90 | | 1-Corning Checkmate 90 | 1-Corning Checkmate 90 |
| 5 | pH/Temp Meters | | 1-Orion 23A | 1-Orion SA-230 | 1-Orion 23A | 1-Orion 23A | 1-Orion 23A |
| 4 | Conductivity/ Salinity Meters | 1 YSI 33 | 1-YSI 33 | 1-YSI 33 | 1-YSI 33 | | |
| 3 | DO Meters | | 1-YSI 51B | 1-YSI 51B | 1-YSI 50B | | |
| 2 | Turbidimeters | | 1-Hach 16800 | 1-DRT 15C | | | |
| 2 | Water Level Meters | | 1-Slope 51453 | 1-Fisher | | | |

## TABLE 9.3

### STANDARD SOURCE AND PREPARATION FOR LABORATORY INSTRUMENTATION

| Instrument Group | Standard Source | How Received | Source Storage | Preparation From Source | Lab Stock Storage | Prep Frequency |
|---|---|---|---|---|---|---|
| ICP | Baker/Spex | Stock 1,000 or 10,000 ppm solutions | Room temp | Working std prepped directly from stock | Room temp | Monthly or as needed |
| AA | Baker/Spex | Stock 1,000 ppm solutions | Room temp | Intermediate stds prepped from stocks.<br>Working stds prepped from intermediates. | Room temp<br>Room temp | Daily<br>Daily |
| Autoanalyzer | Fisher<br>Baker | Neat material | Room temp | Stock stds prepped from solids.<br>Intermediate stds from stocks.<br>Working stds from intermediates. | Refrigerator<br>Used immediately<br>Used immediately | Monthly<br>Daily or as needed<br>Daily or as needed |
| Ion Chromatograph | Fisher<br>Baker<br>Mallinckrodt | Neat material | Room temp | Stock stds prepped from solids.<br>Intermediate stds from stocks.<br>Working stds from intermediates. | Refrigerator<br>Used immediately<br>Used immediately | Monthly<br>Daily or as needed<br>Daily or as needed |
| UV-VIS Spectrophotometer | Fisher<br>Baker<br>EM | Neat Material | Room temp | Stock stds prepped from solids.<br>Intermediate stds from stocks.<br>Working stds from intermediates. | Refrigerator<br>Used immediately<br>Used immediately | Monthly<br>Daily or as needed<br>Daily or as needed |
| IR Spectrophotometer | Fisher | Neat liquids | Room temp | Stock std prepped from neat liquid.<br>Working stds from stock. | Refrigerator<br>Refrigerator | Monthly<br>Monthly |
| Turbidimeter | Hach | Standard 4000 ppm formazin solution | Refrigerator | Working stds prepped from stock. | Used immediately | As needed to check Gelex stds |

TABLE 9.3

STANDARD SOURCE AND PREPARATION FOR LABORATORY INSTRUMENTATION

| Instrument Group | Standard Source | How Received | Source Storage | Preparation From Source | Lab Stock Storage | Prep Frequency |
|---|---|---|---|---|---|---|
| Conductivity Meter | YSI or Fisher | Standard solution or neat KCl | Room temp | Used as is or prepare from neat. | Room temperature | As needed |
| TOC | Mallinckrodt | Neat KHP | Room temp | Stock std from solid<br>Working std from stock. | Refrigerator<br>Refrigerator | Monthly<br>Monthly |
| pH Meter | Fisher | Calibration buffer solutions | Room temp | Used as is. | ---- | ---- |
| ISE | Baker | Neat material | Room temp | Stock std from source.<br>Intermediate std from stock.<br>Working std from intermediate. | Refrigerator<br>Refrigerator<br>Used immediately | Monthly<br>Monthly or as needed<br>As needed |
| TOX | Fisher | Neat material | Room temp | Std from source. | Room temp | Monthly |
| Bomb Calorimeter | Parr | Neat tablets | Room temp | Used as is. | ---- | ---- |
| Gas Chromatographs and GC/MS (Volatiles) | Supelco, Ultra, Accustandard, ChemService, Baxter, Aldrich, Restek | Neat<br>Solutions<br>(50-5000 ppm) | Freezer | Stock stds from neat sources.<br>Intermediate stds from stocks.<br>Working standards from intermediates and/or purchased solutions. | Freezer<br>Freezer<br>Freezer | Annually or as noted by manufacturer expiration date.<br>Semiannually -- (2 months or sooner for gases, styrene, 2-chloroethylvinyl ether)<br>Weekly |
| Gas Chromatographs and GC/MS (Semivolatiles) | Supelco, Restek, ChemService, Crescent Chemical, Aldrich, Ultra | Neat<br>Solutions<br>(50-10000 ppm) | Refrigerator | Stock stds from neat sources.<br>Intermediate stds from stocks.<br>Working standards from intermediates. | Refrigerator or freezer<br>Refrigerator or freezer<br>Refrigerator or freezer | Semi-annually or annually as required<br>Semi-annually or annually as requied<br>Semiannually or as needed |

TABLE 9.3

STANDARD SOURCE AND PREPARATION FOR LABORATORY INSTRUMENTATION

| Instrument Group | Standard Source | How Received | Source Storage | Preparation From Source | Lab Stock Storage | Prep Frequency |
|---|---|---|---|---|---|---|
| High Performance Liquid Chromatographs | ChemService, Crescent Chemical, Supelco | Neat<br>Solutions<br>> 1000 ppm | Refrigerator | Stock stds from neat sources.<br>Intermediate stds from stocks and/or purchased solutions.<br>Working standards from intermediates. | Refrigerator<br>Refrigerator<br>Refrigerator | Semi-annually<br>Monthly<br>Weekly |
| Gas Proportional Counter (alpha/beta) | EPA NIST | Sealed Source<br>Stock Soln. | Room temp Metal case<br>Room temp Foil-lined cabinet | Used as is.<br>Working std, prepped from stock. | --<br>Room temp Foil-lined cabinet | --<br>As needed |
| Radon Flask Counter | EPA NIST | Sealed Source<br>Stock Soln. | Room temp Foil-lined cabinet<br>Room temp Foil-lined cabinet | Used as is.<br>Working std, prepped from stock. | --<br>Room temp Foil-lined cabinet | --<br>As needed |

## TABLE 9.4

### STANDARDIZATION OF TITRATING SOLUTIONS

| Analysis | Solution Requiring Standardization | Standard Identity | Standard Source | Frequency of Standardization |
|---|---|---|---|---|
| Acidity | Sodium Hydroxide (0.02 N) | KHP | Mallinckrodt | With each batch |
| Alkalinity | Sulfuric acid | $Na_2CO_3$ | Mallinckrodt | With each batch (or purchased certified) |
| COD | Ferrous ammonium sulfate | $K_2Cr_2O_7$ | Mallinckrodt | With each batch |
| Chloride | Silver nitrate | NaCl | Baker | With each batch (or purchased certified) |
| Sulfide | Sulfide working standard | $I_2/Na_2S_2O_3$ | VWR/Baker | Weekly |
| TOC (Soil) | Ferrous sulfate | $K_2Cr_2O_7$ | VWR/Baker | With each batch |

### 9.4.1 Metals

ICP

The inductively coupled plasma atomic emission spectrophotometer is standardized daily with single concentration standard solution containing metals of interest and a blank. Multipoint calibrations are performed at least annually with a minimum of three standards and a blank encompassing the concentration range of interest. The calibration curve is maintained to verify the linearity of each metal over the standardization range. After standardization, the standardization standards are reanalyzed and must agree with ± 5% of the true value. Initial calibration verification (ICV) standards are analyzed and must agree within ± 10% of true value. To verify low-level linearity, a standard at the quantitation limit is analyzed and must meet established control limits. This is followed by interference check standards A and AB which must be within ± 20% of true values. Continuing calibration verification (CCV) standards are run after every 10 samples and sample data must be bracketed by calibration verification standards that are ± 10% of true values in order for data to be acceptable. For method 200.7, ICV/CCV standards must be within ± 5% of true values in order for bracketed data to be acceptable. Duplicate lab control standards are digested and analyzed with each batch of samples to determine accuracy and precision, and must be recovered within established control limits for batch data to be acceptable.

AA

Atomic absorption spectrophotometers are calibrated daily with a minimum of three standards and a blank. An ICV standard is analyzed immediately upon calibration, and must meet accuracy criteria of 90-110%. CCV standards are analyzed after every 10 samples and must be recovered within 80-120% for bracketed data to be acceptable. Lab control standards (digested standards) are analyzed in duplicate for every batch of 20 samples and must be recovered established control limits for batch data to be acceptable.

### 9.4.2 General Chemistry

Autoanalyzer

The autoanalyzer is calibrated daily with a minimum of five standards. The calibration curve is established by linear regression and the correlation coefficient must be ≥ 0.995. Independent calibration verification standards are analyzed immediately following the calibration standards, after every 10 samples, and at the end of each run. Data must be bracketed by calibration verification standards that meet control criteria to be acceptable.

Ion Chromatograph

For initial validation of the method and to determine linearity of the calibration curve, three to five standards are analyzed. Either linear regression or quadratic curve fitting is used, depending on analyte. The linear regression correlation coefficient must be ≥ 0.995 for any analyte

to be considered as giving a linear response. After initial validation, for linear analytes, the instrument is standardized daily with a single point standard. Calibration verification standards are analyzed immediately upon calibration, after every 10 samples, and at the end of each run. Data must be bracketed by calibration verification standards that meet control criteria to be acceptable.

UV-VIS Spectrophotometer

The spectrophotometer is calibrated daily with a minimum of five standards. The calibration curve is established by linear regression and the correlation coefficient must be $\geq 0.995$. Calibration verification standards are analyzed immediately following the calibration standards, after every 10 samples, and at the end of each run. Data must be bracketed by calibration verification standards that meet control criteria to be acceptable.

IR Spectrophotometer

The infrared spectrophotometer is calibrated daily with a minimum of five standards. The calibration curve is established by linear regression, and the correlation coefficient must be $> 0.995$. A calibration verification standard is analyzed immediately upon calibration, after every 10 samples, and at the end of each run. Data must be bracketed by calibration verification standards that meet control criteria to be acceptable.

Turbidimeter

Gelex solid standards are calibrated against formazin standards initially and then quarterly. The instrument is calibrated daily with one Gelex standard for each range of interest. A mid-range calibration verification standard is analyzed for every 10 samples and must meet control criteria in order for bracketed data to be acceptable.

Conductivity Meter

The cell constant of each meter is determined at a minimum annually by the analysis of five KCl standards. To verify the cell constant, a verification standard is analyzed at the beginning of each working day, using a KCl standard in the expected range of the samples. For meters not having automatic temperature compensation, all samples are analyzed at 25° C ± 2° C.

pH Meter

The pH meter is calibrated daily with two standard buffers at pH 7.0 and either 4.0 or 10.0, and checked with a third buffer at 10.0 or 4.0 which must indicate ± 0.10 pH units of its given value. A calibration verification standard is analyzed immediately upon calibration and after every 10 samples. The calibration verification standard must meet control criteria in order for bracketed data to be acceptable. Manual or automatic temperature compensation is performed, depending on the meter. Additional checks of the pH meter may be performed with buffers other than 4 or 10 if samples are outside the pH range of 4-10.

TOC

A single point standard is used to calibrate the instrument daily. A calibration verification standard is analyzed immediately upon calibration, after 10 samples, and at the end of each run. Data must be bracketed by calibration verification standards that meet control criteria to be acceptable.

ISE

Ion selective electrodes are calibrated daily with a minimum of five standards. The calibration curve is established by linear regression applied to the log of the standard concentrations versus potential and must result in a correlation coefficient $\geq$ 0.995. Calibration verification standards are analyzed immediately upon calibration, after every 10 samples, and at the end of each run. Data must be bracketed by calibration standards that meet control criteria to be acceptable.

TOX

Although the TOX instrument provides an "absolute" measurement, and is not subject to calibration, a check standard is analyzed daily immediately after the blank, and must meet control criteria in order for data to be acceptable.

Bomb Calorimeter

The energy equivalent of the bomb calorimeter is determined quarterly by bombing six standard benzoic acid tablets. A control standard is analyzed in duplicate for every batch of samples, and must meet control criteria in order for data to be acceptable.

DO Meter

DO meters are calibrated prior to use either by Winkler titration or the air calibration technique, and annually by Winkler titration.

Temperature

All laboratory and field thermometers are calibrated annually by comparison with a NIST-certified thermometer. Field meters with automated temperature compensation are checked before use with a calibrated thermometer.

9.4.3 Gas Chromatographs

Volatiles

Initial calibration is performed upon instrument startup and whenever continuing calibration fails the acceptance criteria. A five-point standard curve is prepared using all target compounds. The low standard concentration is near the PQL, and the high standard defines the usable linear range of the detector. After the five standards are purged and analyzed, a calibration curve is generated using internal standard

methodology. If the internal standard exhibits matrix interference in sample, external standard methodology may be used; however, an internal standard is preferred for purge-and-trap methods. Ideally, all volatile compounds should exhibit enough linearity to use a straight line fit forced through the origin. However, some compounds may exhibit true non-linearity but consistent performance using a quadratic fit. A quadratic fit curve may be used. The analyst should visually inspect the curves before proceeding with sample analysis.

An alternative to quantitation from a calibration curve is quantitation from an average response factor (RF). This is an acceptable technique for all SW-846 8000-series methods, all 40 CFR 136 600-series methods, and all 500-series drinking water methods. For the 8000-series methods, if the % RSD is < 20%, the average RF may be used. For the 500- and 600-series methods, if the % RSD is < 10%, the average RF may be used. Quantitation from the curve is preferred.

Continuing calibration check (CCC) standards are analyzed at the intervals specified in the methods. The CCC standard concentration is normally the mid-point of the five-point calibration curve, and must be at the level specified in the method "Q-tables" for the 600- and 8000-series methods. The 500- and 600-series methods specify a mid-level CCC at the beginning of each working day. The 8000-series methods specify a mid-level standard at the beginning of each working day and after every ten samples thereafter if needed for further sample analyses. The acceptance criteria for the 600- and 8000-series methods for volatiles are listed in each method's "Q-table." The analyzed value of each standard component must fall within the range of values given in the table. For compounds not present on the Q-table, the analyzed value must fall within 15% of the true value, or the laboratory may generate internal acceptance ranges based on a minimum of thirty data points. The acceptance limits for the 500-series methods are ± 20% of the true value.

If the CCC standard fails acceptance criteria, another CCC standard may be analyzed. If the second standard also fails, the initial calibration must be repeated.

2-Chloroethyl vinyl ether exhibits erratic chromatographic behavior. The Supelco, Inc. Purgeable A Mixture footnotes 2-chloroethyl vinyl ether with the following: "Due to instability of 2-chloroethyl vinyl ether, we cannot guarantee the concentration of this component." These problems with 2-chloroethyl vinyl ether impact the ability of SL to consistently analyze for this compound within the method requirements or PQL. If the requirements or PQL cannot be met for 2-chloroethyl vinyl ether, the appropriate flag should accompany the data for this compound in the report.

Single-point calibrations are used for method 504 as specified in the method.

Semivolatiles/Pesticides/Herbicides

Initial calibration is performed upon instrument startup and whenever a CCC standard fails the acceptance criteria. A five-point standard curve

is prepared using all target compounds. The low standard concentration is near but above the MDL and the high standard defines the usable linear range of the detector.

After the five standards are injected, the computer software generates a calibration curve using either internal standard or external standard methodology. The analyst chooses the best fit type for each compound, either linear or quadratic. The analyst should inspect the curves before proceeding with sample analysis. An alternative to quantitation from a calibration curve is quantitation from an average response factor as long as the minimum %RSD criterion is met. The %RSD criteria are as follows:

1. < 10% for 600-series methods.
2. < 20% for 8000-series methods.
3. ≤ 20% for 500-series methods, except Method 504 must be < 20%.

CCC standards are analyzed at the intervals specified in the methods. The 8000-series methods specify a CCC standard at the beginning of each working day and after every 10 samples thereafter if needed for further sample analyses. The 600-series methods specify a CCC standard at the beginning of each working day. The 8000- and 600-series methods CCC standard acceptance criteria are ± 15% difference from the true value. The 500-series methods specify a CCC standard at the beginning of each work day. An additional CCC standard, different in concentration from the initial standard, must be run at the end of the work day when using the external standard calibration technique for methods 507, 508, and 515.1. The acceptance criteria for these CCC standards is ± 20% difference from the true value. The 500-series methods allow a single point calibration as an alternative as long as the response produced by an unknown in the sample extract is ± 20% of the standard response.

If the CCC standard fails acceptance criteria, another CCC standard may be analyzed. If the second standard also fails, the initial calibration must be repeated.

The above calibration procedures meet or exceed EPA method requirements.

The CLP protocol differs from the other EPA methodologies. Calibration curves with a minimum of three points are kept on record at the lab. The CLP statements of work are followed as written.

9.4.4 GC/Mass Spectrometer

Hardware tuning is performed on each GC/MS prior to calibration as specified in the applicable EPA methods. Ion abundance acceptance criteria for semivolatile GC/MS tuning with DFTPP and volatile tuning with BFB are given below. Mass calibration is performed as an integral part of tuning. Tuning is performed at the beginning of each 12-hour clock for each GC/MS in accordance with EPA methods.

| SEMIVOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION (DFTPP) | |
|---|---|
| **m/e** | **Ion Abundance Criteria** |
| 51 | 30-60% of mass 198 |
| 68 | < 2% of mass 69 |
| 70 | < 2% of mass 69 |
| 127 | 40-60% of mass 198 |
| 197 | < 1% of mass 198 |
| 198 | Base peak, 100% relative abundance |
| 199 | 5-9% of mass 198 |
| 275 | 10-30% of mass 198 |
| 365 | > 1% of mass 198 |
| 441 | Present but less than mass 443 |
| 442 | > 40% of mass 198 |
| 443 | 17-23% of mass 442 |

| VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION BROMOFLUOROBENZENE (BFB) | |
|---|---|
| m/e | Ion Abundance Criteria |
| 50 | 15.0 - 40.0% of mass 95 |
| 75 | 30.0 - 60.0% of mass 95 |
| 95 | Base peak, 100% relative abundance |
| 96 | 5.0 - 9.0% of mass 95 |
| 173 | Less than 2.0% of mass 174 |
| 174 | Greater than 50.0% of mass 95 |
| 175 | 5.0 - 9.0% of mass 174 |
| 176 | Greater than 95.0 %, but less than 101.0% of mass 174 |
| 177 | 5.0 - 9.0% of mass 176 |

Initial calibration is performed at instrument startup and whenever a CCC standard fails acceptance criteria. A five-point standard curve is prepared containing all target compounds. Concentrations are those defined by CLP, which are also appropriate for other EPA methodology.

Response factors are generated for each compound. The acceptance criteria used to assess the calibration are those specified in SW-846 for the 600- and 8000-series methods and in the various CLP SOWs for CLP analyses. These are as follows:

| Semivolatiles | | |
|---|---|---|
| | **Initial Calibration** | **Continuing Calibration Check** |
| 625 and 8270 | < 30% RSD for CCCs | ≤ 30% difference for CCCs |
| Semivolatile CLP 2/88 SOW | < 30% RSD for CCCs | ≤ 25% difference for CCCs |
| 625, 8270, CLP 2/88 SOW | ≥ 0.050 SPCCs | ≥ 0.050 for SPCCs |
| CLP 3/90 SOW | As specified in 6/91 Revision of Method (OLM01.6) | |
| 525 | ≤ 30% RSD or alternatively generate linear, 2nd order, or 3rd order calibration curve | ≤ 30% difference or alternatively (using analyst discretion), all analytes fall on the curve from the initial calibration |

| Volatiles | | |
|---|---|---|
| | **Initial Calibration** | **Continuing Calibration Check** |
| 624 | < 30% RSD for CCCs | 20 ug/L standard meets limits specified in Q Table |
| 8240 + CLP 2/88 SOW | < 30% RSD for CCCs | ≤ 25% difference for CCCs |
| 624, 8240, CLP 2/88 SOW | ≥ 0.300 for SPCCs (except Bromoform ≥ 0.250) | ≥ 0.300 for SPCCs (except Bromoform ≥ 0.250) |
| CLP 3/90 SOW | As specified in 6/91 Revision of Method (OLM01.6) | |
| 524.2 | ≤ 20% RSD or alternatively generate linear, 2nd or 3rd order curve | ± 30% difference or alternatively) using analyst discretion), all analytes must fall on the curve from the initial calibration |

CCC standards are analyzed at the intervals specified in the methods. These intervals are as follows:

1. 500-series -- every 8 hours
2. 600-series -- every working day
3. CLP & 8000-series -- every 12 hours.

If the CCC standard fails acceptance criteria, another CCC standard may be analyzed. If the second standard also fails, the initial calibration must be repeated.

Sample quantitation is based on the average RF or curve (when RTE data systems are not available) from the initial calibration for 500-, 600-, and 8000-series methods and the single point RF from the continuing calibration standard for CLP.

Hexachlorophene exhibits very poor chromatographic behavior within the limits of the working calibration range. If this compound is not detected, ND (not detected) will be reported rather than a detection limit.

2-Chloroethyl vinyl ether exhibits erratic chromatographic behavior. The Supelco, Inc. Purgeable A Mixture footnotes 2-chloroethyl vinyl ether with the following: "Due to instability of 2-chloroethyl vinyl ether, we cannot guarantee the concentration of this component." These problems with 2-chloroethyl vinyl ether impact the ability of SL to consistently

analyze for this compound within the method requirements or PQL. If the requirements or PQL cannot be met for 2-chloroethyl vinyl ether, the appropriate flag should accompany the data for this compound in the report.

### 9.4.5 High Performance Liquid Chromatographs

Initial calibration is performed at instrument startup, following instrument maintenance or change in conditions, and whenever CCC fails acceptance criteria.

A three-point curve is prepared for 500- and 600-series methods. Five points are used for 8000-series methods. The low standard is near the PQL and the high standard defines the usable linear range of the detector.

After the three or five calibration standards are analyzed, a calibration curve is generated by the instrument computer, using external standard methodology. Where data system capabilities are limited, response factors are generated. RSD criteria of 10% for the 600-series methods and 20% for the 500- and 8000-series methods are applied. If the maximum RSD criteria are met, the average RF is used for quantitation.

A CCC using a mid-level standard is performed at the beginning of each working day and after every ten samples or as required by the method. Acceptance criteria are ≤ 10% difference from the true value or average RF for the 600-series methods, ≤ 20% D for the 500-series methods, and ≤ 15% D for the 8000-series methods.

If the CCC standard fails acceptance criteria, another CCC standard may be analyzed. If the second standard also fails, the initial calibration must be repeated.

### 9.4.6 Gas Flow Proportional Counter

Initial calibration is performed at instrument start up, following instrument maintenance or a change in quench gas. Counting voltage is set utilizing a sealed beta source by increasing the voltage through the detector until the beta plateau region is determined. The amount of cross-talk into the alpha channel is then minimized and the beta count maximized utilizing the discriminator. Counting efficiencies are then established utilizing the (relatively) pure beta and alpha source standards. These standards are analyzed daily, and recalibration is required if their activity count varies 5% or more.

Self-absorption curves are generated at a frequency of once every three months, and the results are plotted on a cumulative scatter plot curve. Values for self-absorption are then taken from the best fit curve generated from this plot and applied to all sample result calculations. Duplicate laboratory control samples are analyzed with each batch of 20 samples to determine accuracy and precision. Additionally, a matrix spike and matrix spike duplicate or sample duplicate are analyzed with each batch of samples. Instrument background counts are also performed daily for use in all sample result calculations for that day.

**Radon Flask Counter**

Initial calibration is performed at instrument start up or following instrument maintenance. The alpha plateau region is initially determined utilizing a sealed source alpha emitter. Each radon flask is then evacuated, filled with helium at atmospheric pressure, and background counted. Their individual efficiencies are then determined utilizing a standard of known activity. The sealed source alpha emitter is counted daily, and recalibration is required if its activity varies by 10% or more.

Duplicate laboratory control samples are analyzed with each batch of 20 samples to determine accuracy and precision. Additionally, a matrix spike and matrix spike duplicate or sample duplicate are analyzed with each batch of samples.

## 9.5 Low Level Calibration Check for Florida Samples

For all projects which require Florida DEP QAS criteria, an additional continuing calibration check standard at a level near the PQL (usually lowest level standard) is analyzed. This check standard is used to ascertain that the PQL can be reached.

## 9.6 Field Instrument Calibration

Calibration of field instrumentation (conductivity/salinity meters, pH meters, DO meters, and turbidimeters) is performed in the field prior to use, in accordance with the DEP *Calibration Procedures and Frequency SOP*, Section 7.5, revised September, 1992. All calibration data are documented in a bound field notebook.

## 9.7 Calibration Documentation

All calibration records including raw data, response factors, standard concentrations, curves, reduced data, and instrument settings or conditions are stored and archived according to laboratory standard operating procedures. Current chromatograms, curves, and results transcribed onto forms are kept at the analysts' workstations and periodically archived into a data storage area. Initial and continuing calibrations are stored by date for ease of location. All standard ID numbers appear on graphs, plots, chromatograms, or curves for traceability purposes.

# 10.0 PREVENTIVE MAINTENANCE

## 10.1 Maintenance Schedule

All Savannah Laboratories facilities are equipped with up-to-date computerized instrumentation. In order to gain maximum performance and minimize downtime, regular inspection, maintenance, cleaning, and servicing of all laboratory and field equipment is performed according to the manufacturers' recommendations. A maintenance log is kept for each piece of laboratory and field instrumentation, detailing any malfunction and the steps taken to correct the problem. Routine repairs and maintenance are performed and documented by the analyst responsible for the particular instrument. Non-routine maintenance is signed and dated by the analyst or repair technician. Routine maintenance procedures for laboratory instrumentation are given in Table 10.1. The frequencies of routine maintenance procedures for Savannah Laboratories' field instrumentation are given in Table 10.2.

Maintenance contracts are carried for most instrumentation, and close contact is maintained with service personnel to provide optimum instrument functioning.

An extensive spare parts inventory is maintained for routine repairs at the facilities, consisting of GC detectors, AA lamps, fuses, printer heads, flow cells, tubing, certain circuit boards and other common instrumentation components. Since instrumentation is standardized throughout the laboratory network, spare parts and components can be exchanged among the labs.

Equipment such as refrigerators, ovens, and incubators are periodically checked with calibrated thermometers. Refrigerators and incubators are checked at least daily and the temperatures documented in a notebook. Sample storage refrigerators must be 4 ± 2° C. All thermometers are calibrated annually against an NIST-certified thermometer.

Electronic analytical balances are calibrated daily with internal mechanisms if available. Calibration checks are performed and documented on all balances at least weekly with Class S weights and must meet the criteria given in Table 10.3. The HAZWRAP program requires checking each balance daily with at least one weight.

## 10.2 Contingency Plan

In general, each facility has at least one backup unit for each critical unit. In the event of instrument failure, portions of the sample load may be diverted to duplicate instrumentation within each facility, the analytical technique switched to an alternate approved technique (such as manual colorimetric determination as opposed to automated colorimetric determination), or samples shipped to another properly certified or approved Savannah Laboratories location (where identical SOPs, QA procedures and instruments are utilized). When shipping samples to another facility, interdivisional chain-of-custody procedures are followed as given in Section 7.

## TABLE 10.1

## LABORATORY EQUIPMENT PREVENTIVE MAINTENANCE SCHEDULE

| EQUIPMENT ITEM | Service Interval | | | | | SERVICE LEVEL |
|---|---|---|---|---|---|---|
| | D | W | M | Q | A | |
| ICAP | | | | | | |
| Profile | X | | | | | Profile on a daily basis. |
| Nebulizer | X | | | | | Inspect and clean. Replace tubing daily. Check flow rate. |
| Filters | | X | | | | Inspect and clean. |
| Spray Chamber | | | X | | | Inspect and clean. |
| Quartz Torch | | | X | | | Clean and realign. |
| D-Shaped Mirrors | | | | X | | Inspect mirror surface and replace if necessary. |
| SMITH-HIEFTJE FURNACE AA SPECTROPHOTOMETER | | | | | | |
| Sapphire Window | X | | | | | Remove and clean with n-propanol. |
| Flow Rate | X | | | | | Place 10 mL DI water in a 10-mL cylinder. Push Neb. Air button and run one minute. Flow should be 2.0 to 2.5 mL. |
| Graphite Tube | X | | | | | Replace if necessary and condition before use. |
| Quartz Windows | X | | | | | Clean window with lint-free cloth and distilled water. |
| Contact Rings and Plates | | | | X | | Replace contact rings if they are worn. |
| Filters | | X | | | | Remove filter from instrument, clean with water and mild soap. |
| ZEEMAN FURNACE AA SPECTROPHOTOMETER | | | | | | |
| Check sampler syringe for air | X | | | | | Flush syringe if necessary. |
| Graphite Tubes | X | | | | | Replace if necessary and condition before use. |
| Graphite Electrodes | | | | X | | Replace contact rings if they are worn. |
| Quartz Windows | X | | | | | Remove and clean with lint-free cloth and DI water and/or alcohol. |
| CONTINUUM FURNACE AA SPECTROPHOTOMETER | | | | | | |
| Quartz Windows | X | | | | | Remove and clean with lint-free cloth and DI water. |
| Graphite Tubes | X | | | | | Replace if necessary and condition before use. |
| Contact Rings and Plates | | | | X | | Replace contact rings if they are worn. |
| Filters | | X | | | | Remove filter from instrument, clean with water and mild soap. |
| D2 Arc Lamp | | | | X | | Check lamp. Adjust or replace as necessary. |
| TURBIDIMETER | | | X | | | Focus optics. |
| CONDUCTIVITY METER | | | | X | | Inspect and replatinize cell as necessary. |

## TABLE 10.1

## LABORATORY EQUIPMENT PREVENTIVE MAINTENANCE SCHEDULE

| EQUIPMENT ITEM | Service Interval | | | | | SERVICE LEVEL |
|---|---|---|---|---|---|---|
| | D | W | M | Q | A | |
| pH METER | X | | | | | Inspect probe membrane, filling solution level. |
| DRYING OVEN | X | | | | | Verify correct temperature with calibrated thermometer. |
| ANALYTICAL BALANCE | | X | | | | Check calibration with class S standard metric weights. Annual inspection. |
| TOP LOADER BALANCE | | X | | | | Check calibration with class S standard metric weights. Annual inspection. |
| ION CHROMATOGRAPH | | | | | | |
| AS3 Column | | | | X | | Inspect quarterly or as required. |
| AS3 Guard Column | | | | X | | Inspect quarterly or as required. |
| Pump Pistons | | | | | X | Inspect annually. |
| AUTOANALYZER | | | | | | |
| Pump Platen | | X | | | | Inspect weekly and replace as required. |
| Pump Tubes | X | | | | | Inspect and replace as needed. |
| Flow Cell | | X | | | | Inspect and clean. |
| BLOCK DIGESTOR | | | | X | | Check calibration against thermometer. |
| UV/VIS SPECTROPHOTOMETER | | | | | X | Semiannual check for wavelength verification. |
| IR SPECTROPHOTOMETER | | X | | | | Inspect and clean exposed optics weekly, if necessary. |
| ION SELECTIVE ELECTRODE | | | X | | | Inspect and polish electrode. |
| BOMB CALORIMETER | | X | | | | Inspect seals, replace if necessary. |
| DISSOLVED OXYGEN METER | X | | | | | Check probe membrane for deterioration. Replace as necessary. |
| BOD INCUBATOR | X | | | | | Temperature checked twice daily. |
| BACTERIOLOGICAL INCUBATOR | X | | | | | Temperature checked twice daily. |
| AUTOCLAVE | | X | | | | Seals inspected and replaced as necessary. |
| WATERBATH | X | | | | | Temperature checked twice daily. |
| TCLP EQUIPMENT | | | | X | | Check rotation rate quarterly. |
| GAS CHROMATOGRAPH - SEMIVOLATILES | | | | | | |
| Autosampler System | X | | | | | Check daily for correct operation. Syringe and tubing solvent cleaned daily. Needles and tubing replaced as needed. |
| Septa | X | | | | | Replace autosampler septa daily and injector as needed. |
| GC Columns (Packed) | | X | | | | Change glass wool plugs at front of column. |
| GC Capillary Columns | X | | | | | Inspect daily. Change glass sleeve insert as needed and cut front of column if necessary. |

## TABLE 10.1

## LABORATORY EQUIPMENT PREVENTIVE MAINTENANCE SCHEDULE

| EQUIPMENT ITEM | Service Interval | | | | | SERVICE LEVEL |
|---|---|---|---|---|---|---|
| | D | W | M | Q | A | |
| ECD | | | | | X | Semiannually cleaned and leak tested by service technician. |
| FID | | | | | X | In-house cleaning as needed. |
| Carrier Gases | | X | | | | Tanks are changed when pressure reads 500 to ensure purity. |
| Oxygen Trap | | | | X | | Inspect and replace as necessary. |
| **GAS CHROMATOGRAPH - VOC** | | | | | | |
| Column | X | | | | | Checked daily. Repack glass wool and replace column as needed. |
| Septum | X | | | | | Checked daily. Replace as necessary. |
| Gas Tank | X | | | | | Levels checked daily. Replace when pressure < 500 psi. |
| Oxygen/Moisture Trap | | | | X | | Inspect and replace as necessary. |
| Particulate Trap | | | | | X | Checked and replaced if problem in GC flow rate. |
| Hall Detector | X | | | | | Checked daily for proper operation and response. |
| FID | X | | | | | Checked daily for proper operation and response. |
| PID | X | | | | | Checked daily for proper operation and response. |
| **GC/MS** | | | | | | |
| Column | X | | | | | Front portion of column checked/maintained daily for contamination; replace every 1 month or as needed. |
| Septum | X | | | | | Changed daily. |
| Injection Port Liner | X | | | | | Changed daily. |
| Splitless Disc | X | | | | | Changed daily. |
| Autosampler | X | | | | | Checked daily for proper function. |
| Rough Pump | | | | X | | Oil changed to ensure proper operation. |
| Turbo Pump | | | | X | | Turbo molecular pump oiled as needed by instrument service representative. |
| Mass Spectrometer | | | | X | | Cleaning of source every 1 month or as needed. |
| Tape Head | | | | | X | Cleaned after each tape. |
| Tape Drive | | | | | X | Cleaned annually. |
| **PURGE AND TRAP** | | | | | | |
| Sorbent Trap | X | | | | | Checked daily. Replace and condition as necessary. |
| Purge Flow | X | | | | | Checked daily, adjust as needed. |
| Gas Tank | X | | | | | Check daily. |

## TABLE 10.1

## LABORATORY EQUIPMENT PREVENTIVE MAINTENANCE SCHEDULE

| EQUIPMENT ITEM | Service Interval | | | | | SERVICE LEVEL |
|---|---|---|---|---|---|---|
| | D | W | M | Q | A | |
| **TOC ANALYZER** | | | | | | |
| Pump Tubes | | X | | | | Inspect and replace if necessary. |
| Flow rate | | | X | | | Check and adjust if necessary. |
| Detector Windows | | | | | X | Check and clean if necessary. |
| **TOX ANALYZER** | | | | | | |
| Pyrolysis Tube | | X | | | | Inspect and clean or replace if necessary. |
| Electrodes | | X | | | | Inspect and clean if necessary. |
| Electrolyte | X | | | | | Replace as necessary. |
| **HPLC SYSTEMS** | | | | | | |
| Pumps | X | | | | | Filter all solvents, water, and extracts if pressure buildup occurs. Visual leak check. Prime pumps at startup. |
| Pumps | | | | X | | Inspect seals, replace as needed. |
| Columns | X | | | | | Check for pressure buildup; store with ends capped in appropriate mobile phase. Visual leak check. |
| Detector Fittings | X | | | | | Visual leak check. |
| Detector Optics | X | | | | | Inspect removable filters for dust, fingerprints. Clean as needed. |
| Detector Optics | | | | | X | Replace lamps as needed. |
| Autosampler | X | | | | | Checked daily for proper operation. Clean, lubricate moving parts as needed. |
| Gases for sparging and autosampler operation | | X | | | | Change tanks when pressure reads 500 psi. |
| **TENNELEC LB5100** | | | | | | |
| Sample Changer | | | | X | | Inspect moving parts, lubricate as needed. |
| Detector | X | | | | | Checked daily for proper operation and response. Serviced by manufacturer only. |
| Detector gas | | | X | | | Change tank when pressure reads 500 psi. Allow new tanks to dissipate radon for two weeks before use. |
| Flow Meter | X | | | | | Checked daily for proper operation. |
| **LUDLUM MEASUREMENTS 2000** | X | | | | | Checked daily for proper operation. Serviced by manufacturer only. |
| **LUDLUM MEASUREMENTS 182** | X | | | | | Check push rod for high voltage engagement daily. Check instrument noise level without flask daily. |

## TABLE 10.2

## FIELD EQUIPMENT PREVENTIVE MAINTENANCE SCHEDULE

| EQUIPMENT ITEM | Service Interval | | | | | SERVICE LEVEL |
|---|---|---|---|---|---|---|
| | D | W | M | Q | A | |
| TURBIDIMETER HACH 16800/DRT-15C | X | | | | | Inspect and replace cell as needed. |
| CONDUCTANCE METER YSI 33 | | | | X | | Inspect and replatinize cell as necessary. |
| FISHER AND ORION pH METERS | X | | | | | Inspect probe membrane, filling solution level. |
| YSI MODEL 50B/51B DISSOLVED OXYGEN METER | X | | | | | Check probe membrane for deterioration. Replace as necessary. |
| CORNING CHECKMATE 90 pH/SC/DO/T° METER | X | | | | | Check probe, call, membrane. |
| FISHER/SLOPE WATER LEVEL METERS | X | | | | | Check probe cord for integrity/cleanliness, meter for response. |

**TABLE 10.3**

**BALANCE CALIBRATION CHECKS**

| Analytical Balance | |
|---|---|
| Class S Weight | Tolerance |
| 0.01 g | ± 0.0002 g |
| 0.1 g | ± 0.0002 g |
| 0.5 g | ± 0.0004 g |
| 1 g | ± 0.0004 g |
| 10 g | ± 0.0005 g |
| 50 g | ± 0.0010 g |
| **Top-Loading Balance** | |
| Class S Weight | Tolerance |
| 0.1 g | ± 0.02 g |
| 0.5 g | ± 0.02 g |
| 1 g | ± 0.04 g |
| 5 g | ± 0.04 g |
| 10 g | ± 0.05 g |
| 50 g | ± 0.10 g |

## 11.0 QUALITY CONTROL CHECKS AND ROUTINES TO ASSESS PRECISION AND ACCURACY AND CALCULATIONS OF METHOD DETECTION LIMITS

The key to a successful QA/QC program is strict adherence to the program during all phases of the project, including: presampling discussions; sample collection, preservation, storage and analyses; and validation and reporting of results. Field and laboratory quality control checks are part of each sampling trip and laboratory analysis and meet or exceed all FL DEP requirements. Without the proper quality control procedures, analyst and method performance cannot be measured.

### 11.1 Field QC Checks

Savannah Laboratories recommends to their clients that proper control procedures meet or exceed the appropriate regulatory agency field QC requirements. If particular field method or project-specific quality assurance plan (QAPjP) QC requirements are more stringent than the general procedures given below, the method QC or QAPjP requirements are followed.

Blanks which are collected in the field are an important link in the quality control data chain for a set of samples. The analytical data derived from these blanks are necessary to assess field sampling operations. These blanks are used to verify that sample containers, preserving reagents and equipment are contaminant-free. Blanks are also used as a check for potential on-site environmental contamination, to evaluate personnel expertise in sample collection and to reveal problems that may occur in sample storage and transport.

The field quality control blanks should not be isolated from actual samples. They must be considered as samples and treated identically (preserved with the same reagents, stored and transported in the same containers as the samples, etc.).

The types and frequency of blanks must be included in all quality assurance plans. In cases where data quality objectives dictate more stringent controls, additional field quality control blanks may be required. The following protocol outlines the minimum field blank requirements necessary to assure the validity and integrity of any sampling episode.

If the client requires or submits field QC check samples, these will be analyzed per client's instructions and invoiced as samples. Since field QC check samples are usually liquids, they are prepared and analyzed by liquid procedures and reported as liquids. Unless requested by clients or required by a project specific QA plan, lab QC deliverables are not provided for field QC check samples.

#### 11.1.1 Trip Blanks

**PURPOSE**: The trip blank is to be used when sampling for volatile organics and other sensitive parameters. The purpose is to determine if contamination has occurred as a result of improper sample container

cleaning, contaminated blank source water, sample contamination during storage and transportation due to exposure to volatile organics (e.g., gasoline fumes) and other environmental conditions during the sampling event.

**PREPARATION**: Trip blanks are prepared prior to the sampling event either by the laboratory providing sample containers, or by field team personnel who are responsible for the initial preparation of sample containers and field equipment. The water must be free of volatile organic contaminants. Any appropriate preservatives must be added at the time that the blanks are prepared. The sample containers are sealed, labeled appropriately, and transported to the field in the same sampling kits as the sample vials. These blanks are not to be opened in the field. They are to be transferred to the sample container designated for volatile sample storage and transport and accompany the samples to the laboratory. Subsequent blanks (field and equipment) for volatile organics should use the same source water as the trip blanks, unless the water used for field and equipment blanks can be proven equivalent.

FREQUENCY: One trip blank for each volatile organic analysis (601, 602, 624, etc.) shall be provided per cooler used for storing and transporting volatile sample vials. If a laboratory requires submission of multiple vials for a method, the same number of vials must be submitted for the trip blank.

11.1.2 Field Blanks

PURPOSE: Field blanks are used to evaluate the effects of on-site environmental contaminants, the purity of reagents used as preservatives or additives and the general sample container filling/collection techniques. Field blanks are recommended for all parameters.

PREPARATION: Field blanks are prepared on-site by filling the sample container(s) with analyte-free water, adding preservatives, sealing the containers and completing the appropriate documentation. The field blanks must be handled in the same manner as the sample group for which it was intended (i.e., blanks must be stored and transported with the sample group).

NOTE: The water for VOA field blanks should be equivalent to the trip blank water (see Trip Blank Preparation).

FREQUENCY: One field blank per parameter group per day or at a frequency of 5% of the samples in the parameter group per day, whichever is greater.

11.1.3 Equipment Blanks

PURPOSE: Equipment blanks are required if sampling equipment is precleaned or field-cleaned. These blanks are used to determine the effectiveness of field cleaning procedures as well as to reveal those sources of contamination that may be found in a trip blank. Equipment

blanks are recommended for all parameter groups and matrices to be collected and analyzed.

**PROCEDURE:** The final rinse water (analyte-free) shall be rinsed on or through the sampling equipment, whether precleaned or field cleaned, collected, and placed in appropriate preserved containers. These blanks must be stored and transported with the samples.

NOTE: The water used for volatile equipment blanks should be from the same or equivalent source as the trip blank water.

**FREQUENCY:** When less than five samples of a similar matrix are taken, one equipment blank prepared on-site for precleaned or field-cleaned equipment should be collected and analyzed for each parameter.

When five to ten samples of a similar matrix are taken, one equipment blank should be collected on field-cleaned equipment or one on-site blank should be collected in precleaned equipment if no equipment is cleaned in the field.

For sampling events involving ten or more samples, a minimum of one blank should be taken on precleaned equipment or at the rate of 5% (whichever is greater) of the samples in each analyte group for all matrices. One blank should be taken on field-cleaned equipment or at the rate of 5% (whichever is greater) of the samples in each analyte group for all matrices.

### 11.1.4 Field Duplicates

Field duplicates are taken, analyzed, reported and invoiced when requested by the client or specified by a project specific QA plan. Savannah Laboratories recommends that a minimum of one duplicate for 10% of samples be taken for all parameter groups and matrices to be collected and analyzed.

### 11.1.5 Field QC Summary

The recommended frequency of field blanks and duplicates is summarized below:

| No. Samples | Precleaned Equipment Blanks | Field-Cleaned Equipment Blanks | Trip Blank (VOCs) | Duplicates |
|---|---|---|---|---|
| 10+ | Minimum of one, then 5% | Minimum of one, then 5% | One per cooler | Minimum of one, then 10% |
| 5-9 | One* | One* | Not required | One |
| < 5 | One* | One* | Not required | Not required |

* Note: For nine or fewer samples, one equipment blank is required from either precleaned or field-cleaned equipment.

If any equipment is cleaned in the field, the blank is to be taken from the field-cleaned equipment.

## 11.2 Laboratory QC Checks

The laboratories employ control samples to assess the validity of the analytical results. Determination of the validity of sample results is based on the acceptance criteria being met by the control samples. The acceptance criteria for each type of control sample are defined in the appropriate SOP. These acceptance criteria are per method requirements or calculated annually from historical data.

For projects which require Florida DEP QAS criteria, matrix spike results will be utilized for laboratory control. If matrix spikes are out of control, laboratory control standard (LCS) results and method control criteria will be utilized for the ultimate determination of control of the analytical batch. For all other projects, LCSs will be utilized primarily to determine if a batch is in control.

Clients are requested to provide sufficient sample for matrix spikes. If the client does not provide sufficient sample replicates for matrix spikes/duplicates, laboratory generated samples will be provided. In cases where laboratory-generated matrices are used, the sample registry in the department logbook will be stamped "Insufficient sample volume was available to perform a batch matrix spike analysis."

For CLP protocols or other cases (i.e., client or QAPjP mandated) where "sample specific" (non-batch) QC is required, matrix spike/duplicate analysis will be conducted on replicate samples provided by the client. In this case, matrix spikes/duplicates will be invoiced as samples. In all other cases, matrix spikes will be on a batch- (not client-, project- or sample-) specific basis.

When possible, aliquots for matrix spikes are taken from the same container as the field sample. In some cases with liquid samples, this is not possible, i.e., semivolatile extractables, oil and grease, TPH, etc.

The control samples are analyzed in the same manner as the field samples. QC check samples are analyzed on an analytical batch frequency unless otherwise stated. An analytical batch is defined as a group of samples which are processed as a unit. If the number of samples in the group is greater than 20, each group of 20 samples or less is handled as a separate batch.

Other QC check samples are analyzed for performance evaluations or as part of internal or external audits as given in Section 14. Unacceptable QC check sample results associated with reported data during project analysis are noted in the project report.

If particular laboratory method or QAPjP QC requirements are more stringent than the general procedures given below, the method QC requirements are followed.

### 11.2.1 Organics

**Method Blanks:** A method blank will be analyzed for each batch of samples.

**Lab Control Standards:** Blank spikes or lab control standards will be processed and analyzed per method requirements with each batch of samples. For drinking water samples, analyte spike concentrations will be at or near reporting limits as specified for lab-fortified blanks in the 500 series methods.

**Surrogates:** Appropriate surrogates (see Tables 5.1 and 5.2) will be added to all samples, standards and blanks.

**Matrix Spikes:** Matrix spikes will be analyzed with each batch at a frequency of 5% of samples if sufficient sample is available. If a method does not specify matrix spiking compounds, the SW-846 or CLP matrix spiking compounds will be used. Appropriate matrix spikes will be used for other chromatographic methods. Matrix spikes containing all compounds will be analyzed periodically to generate accuracy and precision limits.

**Matrix Spike Duplicates/Sample Duplicates:** Duplicate samples or matrix spikes will be analyzed with each batch or at a frequency of 5% of samples if sufficient sample is available. In cases where duplicate matrix spikes are used, precision data are obtained on only the matrix spiking compounds.

### 11.2.2 Inorganic and General Chemistry

**Calibration Blanks:** Calibration blanks are nondigested blanks which are analyzed at a frequency of 10% of samples.

**Method Blanks:** Method blanks should be processed and analyzed with each batch at a frequency of 5% of samples of the same matrix.

**Lab Control Standards:** A blank spike or lab control standard will be processed and analyzed with each batch of samples.

**Matrix Spikes:** Matrix spikes will be analyzed at a frequency of 5% of samples if sufficient sample is available.

**Matrix Spike Duplicates/Sample Duplicates:** Duplicate samples or duplicate matrix spikes will be analyzed at a frequency of 5% of samples if sufficient sample is available.

### 11.2.3 Microbiology

Quality control checks are routinely performed for all microbiological analyses. Strict requirements for the house deionized water must be met before it can be used in any testing. Each monitored parameter, its monitoring frequency, and its acceptance limits is as follows: residual

chlorine, monthly, < 0.1 mg/L; trace metals (total Cd, Cr, Cu, Ni, Pb, Zn), annually, < 1.0 mg/L; conductivity, daily < 1.0 umho/cm; heterotrophic plate count, monthly, < 1000 CFU/mL; inhibitory residue, annually or for each new lot of detergent, less than 15% difference between groups; suitability, annually, ratio between 0.8 and 3.0.

Other laboratory QC practices are utilized to provide accurate microbiological results. These include the use of autoclave tape to insure proper sterilization of sample containers, media, etc. Incubators are maintained at 35 ± 0.5° C and water baths at 44.5 ± 0.2° C. Thermometers used for these monitoring purposes are calibrated annually against an NIST-certified thermometer. Other equipment, such as the dissecting microscope and colony counter are maintained in clean operating condition at all times.

Microbiological samples are analyzed in duplicate at a rate of 10% of positive samples. A positive control sample is analyzed in duplicate with each batch of coliform samples.

Blanks are routinely analyzed with microbiological samples. For membrane filter analyses, a sterile dilution water blank is run initially, after every 10 samples, and at the end of each analytical run. For MPN analysis, sterile dilution water is added to a lauryl tryptose broth tube for a blank for each analytical run.

11.2.4 Radiochemistry

Background Count: Background counts are obtained at a frequency of once per day for gross alpha, gross beta and radium 228; and determined for each flask prior to sample introduction for radium 226.

Method Blanks: Method blanks are analyzed at a frequency of 5% of samples of the same matrix.

Lab Control Standards: Lab control standards are analyzed with each batch of 20 samples of the same matrix.

Matrix Spike/Matrix Spike Duplicate or Sample Duplicates: These are analyzed with each batch of 20 samples of the same matrix.

11.3 Routine Methods Used to Assess Precision and Accuracy

Control charts (Figures 11.1 and 11.2) for precision and accuracy are initiated for each parameter upon method validation. Control charts are based on procedures in *The Handbook for Analytical Quality Control in Water and Wastewater Laboratories* (EPA, 1979) and contain both "warning limits" (± 2 standard deviations) and "control limits" (± 3 standard deviations). Control limits are updated annually for all parameters. A minimum of ten data points is used to update these limits. Formulas used for calculations of precision and accuracy are provided in Section 5.0.

In order to assess precision and accuracy, sample concentrations can be divided into three ranges: low, mid, and high. Low level is defined as concentrations from the minimum detection limit to a level five times the MDL. Mid level is defined as the mean level between the minimum detection level and the upper end of the linear range. High level is defined as the concentration at the upper end of the linear range. The accuracy and precision limits in Tables 5.1, 5.2, and 5.3 were calculated from spikes in the mid-concentration range (Table 11.1) and are used to assess precision and accuracy.

## 11.4 Method Detection Limits and Reporting Limits

Method detection limits (MDLs) are determined biannually in accordance with the procedures in SW-846 and Appendix B of 40 CFR Part 136. This procedure includes analyzing seven or more prepared spikes or standards in reagent water at levels 3-5 times the estimated detection limit. The standard deviation of the replicate measurements is calculated, and the MDL is computed by multiplying by the appropriate Student's t value for the appropriate 99% confidence level (for seven replicates, $t = 3.14$).

The MDL calculated by the procedure described above is defined as the minimum concentration of a substance that can be measured in reagent water and reported with a given confidence that the analyte concentration is greater than zero.

For other protocols (i.e., Contract Laboratory), other procedures are used to estimate detection limits.

Since MDLs are based on the analyses of standards in reagent water, they may not be useful in reporting data for environmental samples. Thus, practical quantitation limits (PQLs) may be used for reporting a non-detected parameter. PQLs are defined as the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.

For data requiring Florida DEP QAS criteria, the PQL can be calculated by multiplying the reported MDL by a factor of four and any required dilution factor.

The term from SW-846, Estimated Quantitation Limit (EQL) is used interchangeably with PQL. In all cases, PQLs are greater than MDLs. When PQLs are defined in SW-846 or the CLP protocols (CRDLs), these defined PQLs are generally used in data reporting provided they are achievable.

FIGURE 11.1
EXAMPLE OF CONTROL CHART FOR % RECOVERY

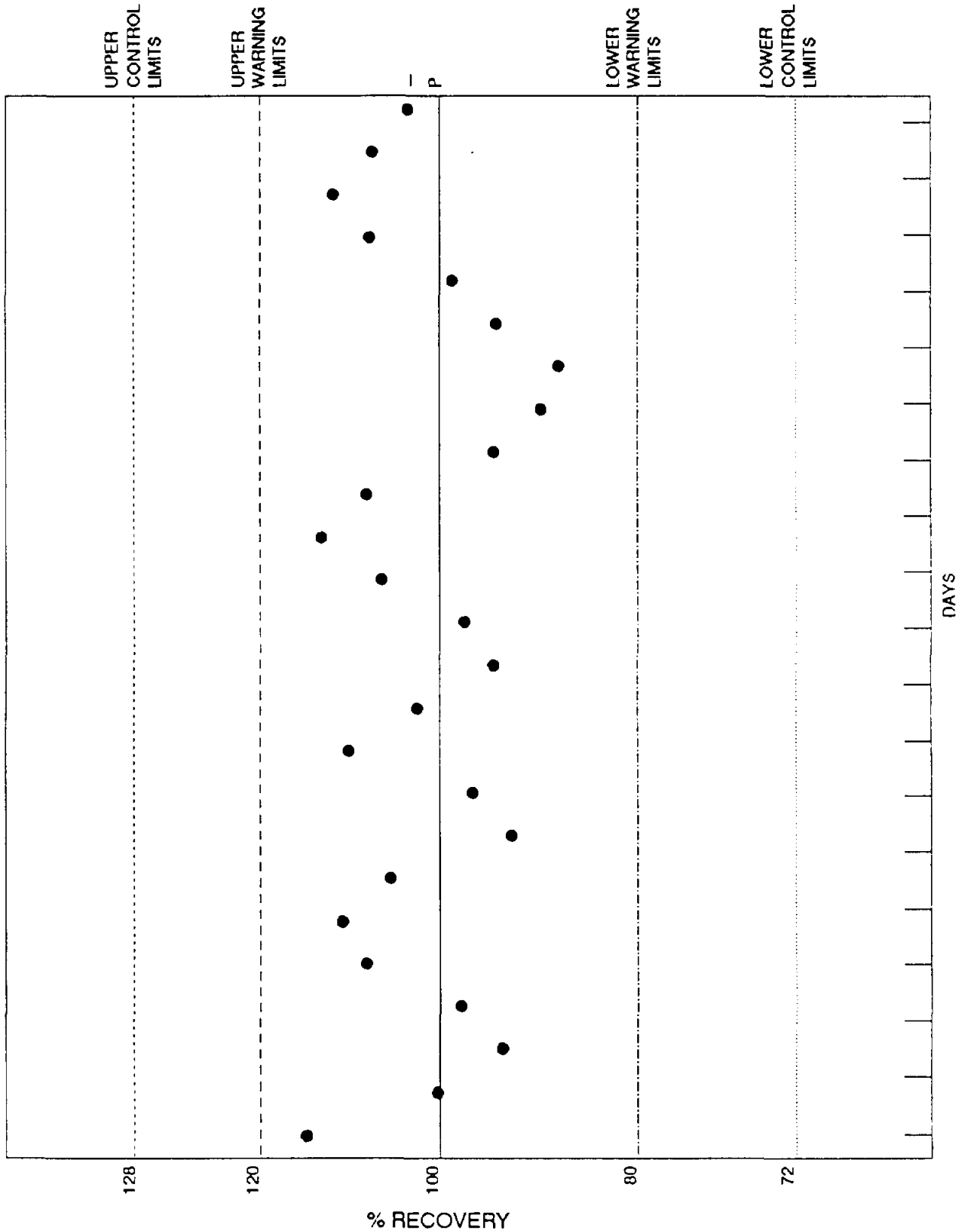


FIGURE 11.2
EXAMPLE OF CONTROL CHART FOR % RPD

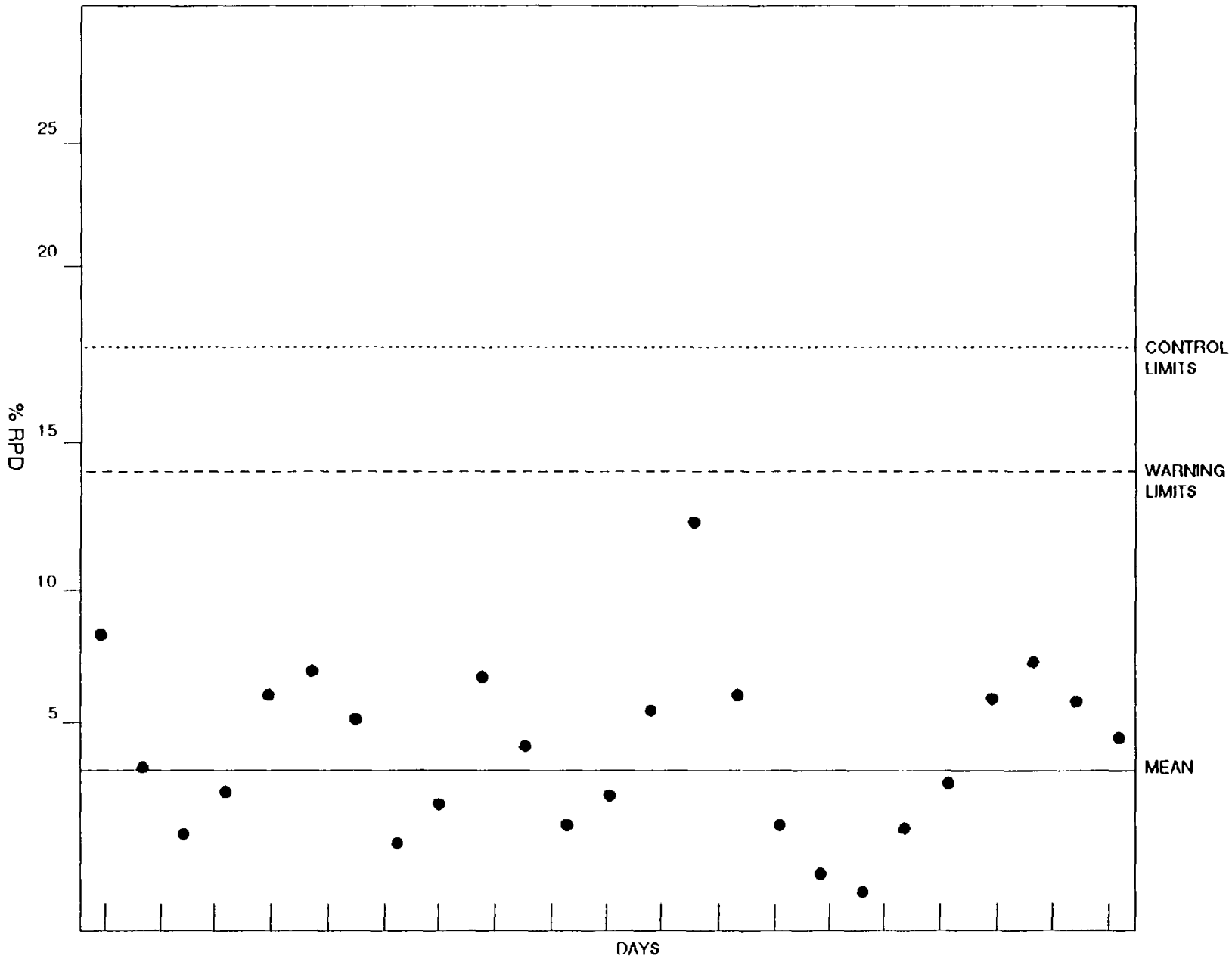


**TABLE 11.1**

**Methods Used to Generate Accuracy and Precision Targets**

| Method | Purpose | Concentration Level | Method References |
|---|---|---|---|
| Quality Control Check Standards (QCCS) or LCS | Accuracy | Mid Level | All metal, general, and organic methods for which a QCCS or LCS is required. |
| Quality Control Check Standards (QCCS) or LCS | Precision | Mid Level | All metal, general, and organic methods for which a QCCS or LCS duplicate is required. |
| Duplicate Samples (DS) | Precision | Mid Level | All methods for which duplicate sample precision is required or a QCCS or LCS is not available. |
| Matrix Spikes (MS) | Accuracy | Mid Level | All metal, general, and organic methods for which an MS is required. |
| Matrix Spike Duplicates (MSD) | Precision | Mid Level | All metal, general, and organic methods for which an MSD is required. |

# 12.0 DATA REDUCTION, REVIEW, AND REPORTING

## 12.1 Introduction

In order to provide the highest quality data possible, an extensive system for sample custody, data reduction, review, and reporting has been implemented.

## 12.2 Sample Custody

Upon receipt of the samples, the custody forms are checked against the sample identifications listed on the containers by the sample custodians, and a unique SL log number is assigned to each sample group. Any discrepancies are noted, including cooler temperatures, broken bottles and/or misidentified samples. Clients are immediately notified if discrepancies exist.

After receipt, the samples are delivered to the appropriate laboratory sections where the samples are checked for proper preservation and this information is recorded in bound notebooks when applicable. When necessary, the samples are then stored in refrigerators that are monitored at least daily for temperature.

## 12.3 Organization and Initiation of Sample Analyses

The key to Savannah Laboratories' sample flow, analysis, data/QA review, archiving, and reporting system is the single LIMS network which controls the day to day production of the laboratories. This system, which is summarized in Figure 12.1, provides project managers, QA personnel, and all analysts immediate information on the status of any sample in all six facilities. This system schedules and prioritizes all work, provides a mechanism for sample tracking, review of reportables and QC data, generation of reports and invoices, and archiving of all reports and associated QC data.

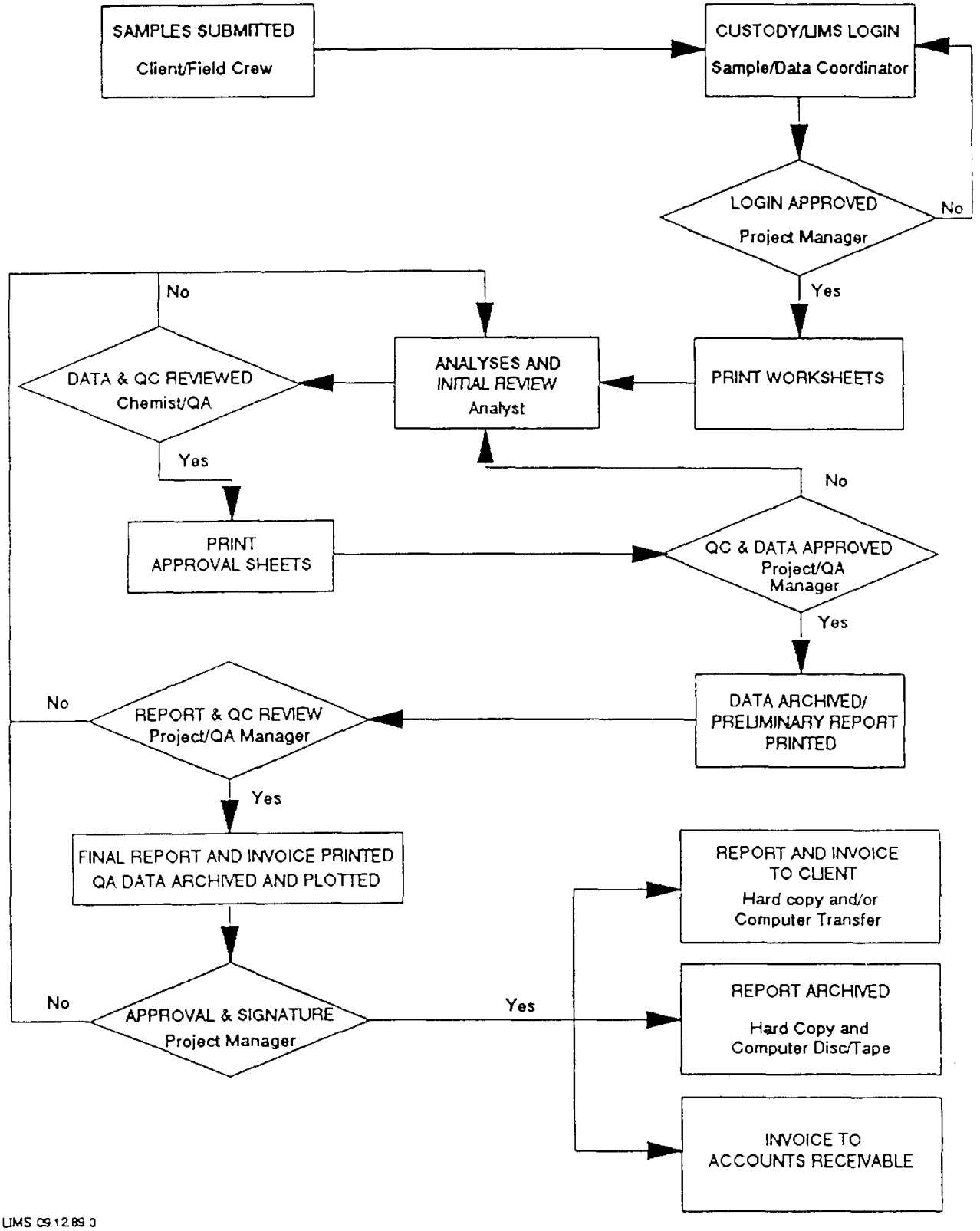
Upon receipt of custody forms, the project manager instructs data management personnel to log the sample analysis request and identification into the LIMS. The LIMS is based on an ADDS Mentor 7000 computer (NCR) which links the laboratories via telephone multiplex. This enables any project manager, section manager, QA manager, laboratory director, or chemist with authority to access and check the status of all projects.

If special handling or data packaging is required, the QA department receives copies of the custody forms and computer acknowledgements, initiates a QA project file and determines the sample batching. A sample delivery group (SDG) sheet is established and distributed to all affected departments including the various laboratory chemists, project managers, and section managers.

After the sample analysis request is logged into the LIMS and approved, the LIMS generates worksheets which are printed and distributed.

FIGURE 12.1

FLOW CHART OF SL COMPUTERIZED LABORATORY INFORMATION MANAGEMENT SYSTEM (LIMS)




LIMS.09.12.89.0

## 12.4 Sample Analysis and Data Reduction

Through the use of the worksheets and/or SDG sheets, the samples are prepared following the procedures given in each of EPA's approved methods. The preparation information is recorded in bound notebooks throughout the laboratory.

### 12.4.1 Data Reduction

Most sample concentration results are read directly from instrumentation without further reduction or calculations. Dilution factors are applied upon the dilution of samples having concentrations above the calibration range. In many cases, these are input into the instrument computer and correct results are calculated automatically. In other cases, a manual calculation may be made. Soil/solid waste concentration results for all laboratory sections are calculated on a dry weight basis prior to reporting by dividing the instrument result by the dry weight fraction.

Other than the cases discussed above, data obtained by the following method/instrument are directly reportable: GC, GC/MS, metals, general chemistry automated colorimetry, TOC, DO, turbidity, and pH.

Methods data requiring reduction prior to reporting include titrimetric methods, BOD, COD, conductivity, manual UV/VIS/IR, residue, TOX, and radiochemical parameters.

Table 12.1 gives equations used in computer-controlled instrumentation for data reduction as well as equations used for the manual calculation of reportable concentration results.

All laboratory pH meters are temperature compensated. Laboratory conductivity is always measured at 25°C.

The laboratory raw data containing the instrument-generated reports, manually calculated results, and all supporting preparation, calibration, and analytical data are retained at the individual work stations until reports are issued unless additional handling or data packaging is required.

All field pH and conductivity meters are temperature compensated. Cell constants for field conductivity meters are determined by laboratory personnel annually as given in Section 9.4.2. Field conductivity is calculated as given in Table 12.1. All other field data are read directly from instrumentation.

Bound field notebooks are used for documentation of required data reduction. Calculations are recorded in waterproof ink.

# TABLE 12.1

## SUMMARY OF EQUATIONS USED IN CALCULATIONS

| Equations | Reporting Units | |
|---|---|---|
| **BN/A Extractables by GC/MS** [Internal Standard Method (625 and 8270)] | **Water** | **Solid*** |
| Response Factor (RF) = $\frac{As \times Cis}{Ais \times Cs}$<br><br>As = area of the characteristic ion of standard<br>Ais = area of the characteristic ion of internal standard<br>Cs = concentration of standard (ug/L)<br>Cis = concentration of the internal standard (ug/L)<br><br>Water Conc., ug/L = $\frac{As}{Ais} \times \frac{Cis}{RF}$<br><br>As = area of the characteristic ion (sample)<br>Ais = area of the characteristic ion (internal standard)<br>Cis = concentration of the standard (ug/L)<br>RF = response factor<br><br>Sediment Conc., ug/kg = $\frac{\text{ug of internal standard}}{(\text{kg of sample})(\%\ \text{solids} \times .01)} \times \frac{As}{Ais} \times \frac{1}{RF}$<br><br>As = area of the characteristic ion (sample)<br>Ais = area of the characteristic ion (internal standard)<br>RF = response factor | ug/L<br>(or mg/L) | ug/kg<br>(or mg/kg) |
| **VOC by GC/MS** [Internal Standard Method - See section on BN/A] | | |
| **VOCs by GC** | | |
| Response Factor (RF) = $\frac{\text{ug/L of compound to be measured}}{\text{peak height}}$<br><br>Water Conc., ug/L = RF x peak height x dilution factor<br><br>Sediment Conc., ug/L = RF x $\frac{\text{peak height x liter equivalent of std. volume}}{(\text{kg of sample})(\%\ \text{solids} \times .01)}$ | ug/L<br>(or mg/L) | ug/kg<br>(or mg/kg) |
| **Pesticides/PCBs and Other GC Procedures** | | |
| Response Factor (RF) (Standard) = $\frac{\text{ug of analyte}}{\text{peak area}}$<br><br>Water Conc., ug/L = RF x peak area x $\frac{\text{extract volume in uL}}{(\text{liters of sample extracted})(\text{injection volume in uL})}$<br><br>Sediment Conc., ug/kg = RF X peak area x $\frac{\text{extract volume in uL}}{(\text{kg of sample extracted})(\%\ \text{solids} \times .01)(\text{injection volume in uL})}$ | ug/L<br>(or mg/L) | ug/kg<br>(or mg/kg) |

# TABLE 12.1

## SUMMARY OF EQUATIONS USED IN CALCULATIONS

| Equations | Reporting Units | |
|---|---|---|
| **Metals** | **Water** | **Solid*** |
| Calibration curve construction<br><br>$y = mx + b$<br><br>y = absorbance<br>m = slope = $\frac{\text{absorbance}}{\text{concentration}}$<br><br>x = concentration (mg/L)<br>b = y intercept<br><br>*Calculation of water sample concentration*<br><br>Water Conc., ug/L = $\frac{y - b}{m}$ x dilution factor<br><br>Sediment Conc., mg/kg =<br>mg/L x dilution factor x $\frac{\text{final volume (liters) of digest}}{\text{(kg of sample)(\% solids x .01)}}$ | ug/L<br>(or mg/L) | ug/kg<br>(or mg/kg) |
| **UV/VIS and IR Procedures** | | |
| Calibration curve construction (see metals)<br><br>Water<br>Conc., mg/L = $\frac{y - b}{m}$ x dilution factor<br><br>Sediment = mg/L x $\frac{\text{liters of leachate (or digest)}}{\text{(kg of sample)(\% solids x .01)}}$<br>Conc. | mg/L | mg/kg |
| **General Titrimetric Procedures** | | |
| Analyte, mg/L = $\frac{N_{titant} \text{ X Titer}}{\text{Vol. of sample titrated}}$ X eq. wt. X 1000 | mg/L | |
| **BOD** | | |
| BOD, mg/L = $\frac{\text{(Int. DO - Final DO) - Seed Correction Factor}}{\text{Vol. fraction of sample}}$ | mg/L | |
| **COD** | | |
| COD, mg/L = $\frac{\text{(Blk titer - sample titer) X } N_{FAS} \text{ X 8000}}{\text{Vol. of sample, mL}}$ | mg/L | |

# TABLE 12.1

## SUMMARY OF EQUATIONS USED IN CALCULATIONS

| Equations | Reporting Units | |
|---|---|---|
| **Conductivity** | **Water** | **Solid*** |
| Cell constant = $\frac{1000}{\text{Observed conductivity of 1000 - } \mu\text{S/cm std.}}$ | µS/cm | |
| **Residue** | | |
| Residue, mg/L = $\frac{\text{Total wt. - Wt. of dish or filter}}{\text{Vol. of sample, L}}$ | mg/L | |
| **TOX** | | |
| TOX, µg/L = $(C_1 + C_2 - 2C_3) \times \frac{1000 \text{ mL}}{\text{Vol. of sample}}$<br>$C_1$ = instrument reading of 1° column<br>$C_2$ = instrument reading of 2° column<br>$C_3$ = instrument reading of blank column<br>TOX, mg/kg = $\frac{\text{instrument reading}}{\mu\text{L injected}} \times \frac{5}{\text{dry wt. fraction}}$ | mg/L | mg/kg |
| **Gross Alpha, Gross Beta** | | |
| Gross α or β = $\frac{(\text{cpm sample - cpm background})\ (1000)}{(2.22)\ E_1)(E_2)(\text{sample volume in mL or sample mass in mg})}$<br>$E_1$ = counting efficiency<br>$E_2$ = self absorption<br>Counting error = $\frac{(A + B)^{1/2}\ (1.96)\ (1000)}{(2.22)(E_1)(E_2)\ (\text{sample volume in mL or sample mass in mg})}$<br>A = gross counts/(count time in min)$^2$<br>B = background counts/(count time in min)$^2$ | pCi/L | pCi/g |
| **Radium 226** | | |
| Ra-226 = $\frac{C}{(2.22)(E)(V)} \times \frac{1}{1-e^{-zt_1}} \times \frac{1}{e^{-zt_2}} \times \frac{zt_3}{1-e^{-zt_3}}$<br>C = net count rate<br>E = calibration constant for system and scintillation cell<br>V = sample volume in liters<br>$t_1$ = elapsed time (days) between first and second de-emanations, and $z = 0.181 \text{ days}^{-1}$<br>$t_2$ = elapsed time (h) between second de-emanation and counting, and $z = 0.00755 \text{ h}^{-1}$<br>$t_3$ = counting time (min), and $z = 1.26\times10^{-4} \text{ h}^{-1}$<br>z = decay constant for Radon 222 | pCi/L | |

## TABLE 12.1

### SUMMARY OF EQUATIONS USED IN CALCULATIONS

| Equations | Reporting Units | |
|---|---|---|
| **Radium 228** | **Water** | **Solid*** |
| $Ra\text{-}228 = \frac{C}{(2.22)(E)(V)(R)} \times \frac{1}{1-e^{-zt_1}} \times \frac{1}{e^{-zt_2}} \times \frac{zt_3}{1-e^{-zt_3}}$<br>C = net count rate<br>E = counter efficiency for Actinium 228<br>V = sample volume in liters<br>R = (fractional chemical yield of yttrium carrier (fractional chemical yield of barium carrier)<br>z = decay constant for Actinium 228 (0.001884 $min^{-1}$)<br>$t_1$ = ingrowth time (min)<br>$t_2$ = time interval between first yttrium hydroxide precipitation and start of counting time<br>$t_3$ = counting time interval (min) | pCi/L | |

* Data for solid or semisolid samples are reported on a dry weight basis.

### 12.4.2 Chromatographic and Data File Identification

Chromatograms and data files are given a unique alphanumeric identification by the chemists initiating the analyses in each section where appropriate. These file identification numbers reflect either the date the sequence was initiated (GC sections), the order in which the samples were analyzed (GC/MS sections), and/or the sample identification and log numbers given by the client and listed on the LIMS.

## 12.5 Data Transfer and Review

### 12.5.1 Data Transfer to LIMS

The analytical results are entered on the sectional worksheets after review. The worksheet data are entered into the LIMS by the data entry technicians. For many parameters, data are directly transferred to the LIMS by instrument interface.

After the data are entered into the LIMS, approval sheets are printed and checked against the information entered into the LIMS for transfer errors and anomalies.

### 12.5.2 Data Review

Laboratory analytical results are reviewed by the chemist responsible for the analysis and/or a peer chemist or a section supervisor. Prior to entering the reportable data into the LIMS, laboratory raw data have been reviewed, stamped, and signed to ensure that all of the method specifications have been met. This includes checking the extraction, digestion, distillation, and other preparation logs, as well as ensuring that all precision and accuracy requirements are addressed, and all steps of the analyses have been completed. If any problems arise during the analysis of the sample batch, it is the responsibility of the chemist and the section supervisor to bring this to the attention of the project manager, section manager, and QA manager through a written corrective action report.

The field/sampling manager is responsible for data review of all field-generated data. This includes verifying that all field descriptive data is recorded as per Section 6, that all field calibration requirements have been met as per Section 9, that all field QC data have met criteria given in Table 5.3, and that field data are entered accurately on worksheets.

For reports on which QA deliverables are required, data flags are used to inform the project manager and the client of any additional information that might aid in the interpretation of the data. The data flagging system incorporates data qualifiers which are similar to flags specified in the Contract Laboratory Program protocols, as well as additional flags used to help explain batch specific events.

When data acquisition and reporting have been completed, the project manager reviews and prepares the final report. Because the project managers have extensive experience in evaluating analytical data, they

have developed both objective and subjective techniques for data review. Each value reported is reviewed in the context of the respective environmental matrix and all available QC/QA data. Outliers or other abnormal values are carefully scrutinized, and samples are reanalyzed if the abnormalities cannot be explained. Where there are cases in which the results from spiked samples suggest interferences, attempts are made to remove the interferences, or alternate analytical procedures are used. If the interference problem cannot be resolved, the data are flagged and/or a narrative is included with the report.

### 12.5.3 Special Project or Data Package Review

If special handling and/or data packages are requested by the client, QA personnel also review the project report and the raw data. This includes checking that holding time requirements are met, checking calibrations, reviewing all quality control data and/or control charts, and initiating any corrective action or reanalyses that might be appropriate.

## 12.6 Reporting

The final report is printed and signed by the project manager after all review has been completed.

Figures 12.2 - 12.4 are examples of SL Level 0, SL Level 1 and SL Level 2 typical reports for liquid samples. SL Level 3 reports are CLP-type data packages for non-CLP parameters. These are either generated on the LIMS or with specified software (or a combination of both). For CLP reports (SL Level 4), the CLP forms from the CLP SOW are generated by instrument software and are submitted to the client. If requested by the client or a project specific QA Plan, hybrid/custom reports or CLP data packages with diskette deliverables can be provided. All LIMS reports can be downloaded onto diskettes or to most clients' computers.

The data flags that may appear in a project report for Levels 0-3 are defined on the signature page, and any additional comments are also footnoted on this page.

If data packaging is requested, a paginated data package is provided in addition to the project report. The format of the project report and/or data package can be adjusted to meet the needs of the client.

## 12.7 Data Storage

The raw data are stored in metal filing cabinets at each work station until the cabinets are filled to capacity. The data are then transferred to a secured area and filed chronologically by laboratory section in banker's boxes and maintained for three years. If the data are to be purged to the client or need to be separated from the general raw data files, the data can be boxed, labeled and stored in a separate secured area.

Hard copies of all LIMS reports are maintained for five years in client files. All LIMS reports and associated QC data are kept for a minimum of

three years on the LIMS hard diskettes and/or magnetic tape. All data on the LIMS are backed up daily on magnetic tape.

All in-lab data generated by computer systems are stored to tape when the capability exists. The tapes are labeled and stored at the individual work stations.

Keys to the data storage areas are retained by the QA staff and the section/department managers.

**FIGURE 12.2**

**EXAMPLE OF RESULTS ONLY REPORT**

**SL** SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: SE-FLQAP0

Received: 12 MAY 94

Dr. James Andrews
Savannah Laboratories
P.O. Box 13548
Savannah, Georgia 31406

Project: Level 0 (Results Only) Example
Sampled By: Client

REPORT OF RESULTS



| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE SAMPLED |
|---|---|---|
| FLQAP0-1 | Water Sample | 05-12-94 |

| PARAMETER | FLQAP0-1 |
|---|---|
| Volatiles by GC/MS (8240) | |
| Chloromethane, ug/l | <10 |
| Bromomethane, ug/l | <10 |
| Vinyl Chloride, ug/l | <10 |
| Chloroethane, ug/l | <10 |
| Methylene Chloride (Dichloromethane), ug/l | <5.0 |
| Acetone, ug/l | <50 |
| Carbon Disulfide, ug/l | <5.0 |
| 1,1-Dichloroethene, ug/l | <5.0 |
| 1,1-Dichloroethane, ug/l | <5.0 |
| Trans-1,2-Dichloroethylene, ug/l | <5.0 |
| cis-1,2-Dichloroethylene, ug/l | <5.0 |
| Chloroform, ug/l | <5.0 |
| 1,2-Dichloroethane, ug/l | <5.0 |
| 2-Butanone (MEK), ug/l | <50 |
| 1,1,1-Trichloroethane, ug/l | <5.0 |
| Carbon Tetrachloride, ug/l | <5.0 |
| Vinyl Acetate, ug/l | <10 |
| Bromodichloromethane, ug/l | <5.0 |
| 1,1,2,2-Tetrachloroethane, ug/l | <5.0 |
| 1,2-Dichloropropane, ug/l | <5.0 |
| trans-1,3-Dichloropropene, ug/l | <5.0 |
| Trichloroethene, ug/l | <5.0 |
| Dibromochloromethane, ug/l | <5.0 |

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: SE-FLQAP0

Received: 12 MAY 94

Dr. James Andrews
Savannah Laboratories
P.O. Box 13548
Savannah, Georgia 31406

Project: Level 0 (Results Only) Example
Sampled By: Client

REPORT OF RESULTS



| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE SAMPLED |
|---|---|---|
| FLQAP0-1 | Water Sample | 05-12-94 |

| PARAMETER | FLQAP0-1 |
|---|---|
| 1,1,2-Trichloroethane, ug/l | <5.0 |
| Benzene, ug/l | <5.0 |
| cis-1,3-Dichloropropene, ug/l | <5.0 |
| 2-Chloroethylvinyl Ether, ug/l | <50 |
| Bromoform, ug/l | <5.0 |
| 2-Hexanone, ug/l | <50 |
| 4-Methyl-2-pentanone (MIBK), ug/l | <50 |
| Tetrachloroethene, ug/l | <5.0 |
| Toluene, ug/l | <5.0 |
| Chlorobenzene, ug/l | <5.0 |
| Ethylbenzene, ug/l | <5.0 |
| Styrene, ug/l | <5.0 |
| Xylenes, ug/l | <5.0 |

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Project: Level 0 (Results Only) Example
Sampled By: Client

REPORT OF RESULTS



| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES |
|---|---|
| FLQAP0-2 | Method Detection Limit (MDL) |

| PARAMETER | FLQAP0-2 |
|---|---|
| Volatiles by GC/MS (8240) | |
| Chloromethane, ug/l | 4.5 |
| Bromomethane, ug/l | 2.2 |
| Vinyl Chloride, ug/l | 2.8 |
| Chloroethane, ug/l | 3.5 |
| Methylene Chloride (Dichloromethane), ug/l | 1.9 |
| Acetone, ug/l | 7.1 |
| Carbon Disulfide, ug/l | 1.1 |
| 1,1-Dichloroethene, ug/l | 1.7 |
| 1,1-Dichloroethane, ug/l | 0.56 |
| Trans-1,2-Dichloroethylene, ug/l | 1.3 |
| cis-1,2-Dichloroethylene, ug/l | 1.1 |
| Chloroform, ug/l | 0.62 |
| 1,2-Dichloroethane, ug/l | 0.56 |
| 2-Butanone (MEK), ug/l | 3.2 |
| 1,1,1-Trichloroethane, ug/l | 0.75 |
| Carbon Tetrachloride, ug/l | 0.54 |
| Vinyl Acetate, ug/l | 1.8 |
| Bromodichloromethane, ug/l | 0.37 |
| 1,1,2,2-Tetrachloroethane, ug/l | 1.4 |
| 1,2-Dichloropropane, ug/l | 2.4 |
| trans-1,3-Dichloropropene, ug/l | 0.59 |
| Trichloroethene, ug/l | 1.6 |
| Dibromochloromethane, ug/l | 0.53 |

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REPORT OF RESULTS



LOG NO SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES

FLQAP0-2 Method Detection Limit (MDL)

| PARAMETER | FLQAP0-2 |
|---|---|
| 1,1,2-Trichloroethane, ug/l | 0.70 |
| Benzene, ug/l | 1.1 |
| cis-1,3-Dichloropropene, ug/l | 0.59 |
| 2-Chloroethylvinyl Ether, ug/l | 1.7 |
| Bromoform, ug/l | 0.98 |
| 2-Hexanone, ug/l | 3.6 |
| 4-Methyl-2-pentanone (MIBK), ug/l | 2.7 |
| Tetrachloroethene, ug/l | 0.79 |
| Toluene, ug/l | 1.4 |
| Chlorobenzene, ug/l | 0.55 |
| Ethylbenzene, ug/l | 0.65 |
| Styrene, ug/l | 4.8 |
| Xylenes, ug/l | 1.3 |

Methods: EPA SW-846

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Final Page Of Report

**FIGURE 12.3**

**EXAMPLE OF SL LEVEL I REPORT**

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Project: Level I Example Report
Sampled By: Client

REPORT OF RESULTS



| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE SAMPLED |
|---|---|---|
| FLQAP1-1 | Water Sample | 05-12-94 |

| PARAMETER | FLQAP1-1 |
|---|---|
| Volatiles by GC/MS (8240) | |
| Chloromethane, ug/l | <10 |
| Bromomethane, ug/l | <10 |
| Vinyl Chloride, ug/l | <10 |
| Chloroethane, ug/l | <10 |
| Methylene Chloride (Dichloromethane), ug/l | <5.0 |
| Acetone, ug/l | <50 |
| Carbon Disulfide, ug/l | <5.0 |
| 1,1-Dichloroethene, ug/l | <5.0 |
| 1,1-Dichloroethane, ug/l | <5.0 |
| Trans-1,2-Dichloroethylene, ug/l | <5.0 |
| cis-1,2-Dichloroethylene, ug/l | <5.0 |
| Chloroform, ug/l | <5.0 |
| 1,2-Dichloroethane, ug/l | <5.0 |
| 2-Butanone (MEK), ug/l | <50 |
| 1,1,1-Trichloroethane, ug/l | <5.0 |
| Carbon Tetrachloride, ug/l | <5.0 |
| Vinyl Acetate, ug/l | <10 |
| Bromodichloromethane, ug/l | <5.0 |
| 1,1,2,2-Tetrachloroethane, ug/l | <5.0 |
| 1,2-Dichloropropane, ug/l | <5.0 |
| trans-1,3-Dichloropropene, ug/l | <5.0 |
| Trichloroethene, ug/l | <5.0 |
| Dibromochloromethane, ug/l | <5.0 |

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Project: Level I Example Report
Sampled By: Client

REPORT OF RESULTS

Page 2

| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE SAMPLED |
|---|---|---|
| FLQAP1-1 | Water Sample | 05-12-94 |

| PARAMETER | FLQAP1-1 |
|---|---|
| 1,1,2-Trichloroethane, ug/l | <5.0 |
| Benzene, ug/l | <5.0 |
| cis-1,3-Dichlorcpropene, ug/l | <5.0 |
| 2-Chloroethylvinyl Ether, ug/l | <50 |
| Bromoform, ug/l | <5.0 |
| 2-Hexanone, ug/l | <50 |
| 4-Methyl-2-pentanone (MIBK), ug/l | <50 |
| Tetrachloroethene, ug/l | <5.0 |
| Toluene, ug/l | <5.0 |
| Chlorobenzene, ug/l | <5.0 |
| Ethylbenzene, ug/l | <5.0 |
| Styrene, ug/l | <5.0 |
| Xylenes, ug/l | <5.0 |

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REPORT OF RESULTS



LOG NO SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES

FLQAP1-2 Method Detection Limit (MDL)

| PARAMETER | FLQAP1-2 |
|---|---|
| Volatiles by GC/MS (8240) | |
| Chloromethane, ug/l | 4.5 |
| Bromomethane, ug/l | 2.2 |
| Vinyl Chloride, ug/l | 2.8 |
| Chloroethane, ug/l | 3.5 |
| Methylene Chloride (Dichloromethane), ug/l | 1.9 |
| Acetone, ug/l | 7.1 |
| Carbon Disulfide, ug/l | 1.1 |
| 1,1-Dichloroethene, ug/l | 1.7 |
| 1,1-Dichloroethane, ug/l | 0.56 |
| Trans-1,2-Dichloroethylene, ug/l | 1.3 |
| cis-1,2-Dichloroethylene, ug/l | 1.1 |
| Chloroform, ug/l | 0.62 |
| 1,2-Dichloroethane, ug/l | 0.56 |
| 2-Butanone (MEK), ug/l | 3.2 |
| 1,1,1-Trichloroethane, ug/l | 0.75 |
| Carbon Tetrachloride, ug/l | 0.54 |
| Vinyl Acetate, ug/l | 1.8 |
| Bromodichloromethane, ug/l | 0.37 |
| 1,1,2,2-Tetrachloroethane, ug/l | 1.4 |
| 1,2-Dichloropropane, ug/l | 2.4 |
| trans-1,3-Dichloropropene, ug/l | 0.59 |
| Trichloroethene, ug/l | 1.6 |
| Dibromochloromethane, ug/l | 0.53 |

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REPORT OF RESULTS



LOG NO SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES

FLQAP1-2 Method Detection Limit (MDL)

| PARAMETER | FLQAP1-2 |
|---|---|
| 1,1,2-Trichloroethane, ug/l | 0.70 |
| Benzene, ug/l | 1.1 |
| cis-1,3-Dichloropropene, ug/l | 0.59 |
| 2-Chloroethylvinyl Ether, ug/l | 1.7 |
| Bromoform, ug/l | 0.98 |
| 2-Hexanone, ug/l | 3.6 |
| 4-Methyl-2-pentanone (MIBK), ug/l | 2.7 |
| Tetrachloroethene, ug/l | 0.79 |
| Toluene, ug/l | 1.4 |
| Chlorobenzene, ug/l | 0.55 |
| Ethylbenzene, ug/l | 0.65 |
| Styrene, ug/l | 4.8 |
| Xylenes, ug/l | 1.3 |

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Sampled By: Client

REPORT OF RESULTS



| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES |
|---|---|
| FLQAP1-3 | Method Blank |
| FLQAP1-4 | Lab Control Standard (LCS) % Recovery |

| PARAMETER | FLQAP1-3 | FLQAP1-4 |
|---|---|---|
| Volatiles by GC/MS (8240) | | |
| Chloromethane, ug/l | <10 | --- |
| Bromomethane, ug/l | <10 | --- |
| Vinyl Chloride, ug/l | <10 | --- |
| Chloroethane, ug/l | <10 | --- |
| Methylene Chloride (Dichloromethane), ug/l | <5.0 | --- |
| Acetone, ug/l | <50 | --- |
| Carbon Disulfide, ug/l | <5.0 | --- |
| 1,1-Dichloroethene, ug/l | <5.0 | 98 % |
| 1,1-Dichloroethane, ug/l | <5.0 | --- |
| Trans-1,2-Dichloroethylene, ug/l | <5.0 | --- |
| cis-1,2-Dichloroethylene, ug/l | <5.0 | --- |
| Chloroform, ug/l | <5.0 | --- |
| 1,2-Dichloroethane, ug/l | <5.0 | --- |
| 2-Butanone (MEK), ug/l | <50 | --- |
| 1,1,1-Trichloroethane, ug/l | <5.0 | --- |
| Carbon Tetrachloride, ug/l | <5.0 | --- |
| Vinyl Acetate, ug/l | <10 | --- |
| Bromodichloromethane, ug/l | <5.0 | --- |
| 1,1,2,2-Tetrachloroethane, ug/l | <5.0 | --- |
| 1,2-Dichloropropane, ug/l | <5.0 | --- |
| trans-1,3-Dichloropropene, ug/l | <5.0 | --- |
| Trichloroethene, ug/l | <5.0 | 104 % |

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REPORT OF RESULTS



| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES |
|---|---|
| FLQAP1-3 | Method Blank |
| FLQAP1-4 | Lab Control Standard (LCS) % Recovery |

| PARAMETER | FLQAP1-3 | FLQAP1-4 |
|---|---|---|
| Dibromochloromethane, ug/l | <5.0 | --- |
| 1,1,2-Trichloroethane, ug/l | <5.0 | --- |
| Benzene, ug/l | <5.0 | 100 % |
| cis-1,3-Dichloropropene, ug/l | <5.0 | --- |
| 2-Chloroethylvinyl Ether, ug/l | <50 | --- |
| Bromoform, ug/l | <5.0 | --- |
| 2-Hexanone, ug/l | <50 | --- |
| 4-Methyl-2-pentanone (MIBK), ug/l | <50 | --- |
| Tetrachloroethene, ug/l | <5.0 | --- |
| Toluene, ug/l | <5.0 | 97 % |
| Chlorobenzene, ug/l | <5.0 | 110 % |
| Ethylbenzene, ug/l | <5.0 | --- |
| Styrene, ug/l | <5.0 | --- |
| Xylenes, ug/l | <5.0 | --- |

Methods: EPA SW-846

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Final Page Of Report

FIGURE 12.4

EXAMPLE OF SL LEVEL II REPORT

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Project: SL Level II Example Report
Sampled By: Client

REPORT OF RESULTS

Page 1

| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE SAMPLED |
|---|---|---|
| FLQAP2-1 | Water Sample | 05-12-94 |

| PARAMETER | FLQAP2-1 |
|---|---|
| Volatiles by GC/MS (8240) | |
| Chloromethane, ug/l | <10 |
| Bromomethane, ug/l | <10 |
| Vinyl Chloride, ug/l | <10 |
| Chloroethane, ug/l | <10 |
| Methylene Chloride (Dichloromethane), ug/l | <5.0 |
| Acetone, ug/l | <50 |
| Carbon Disulfide, ug/l | <5.0 |
| 1,1-Dichloroethene, ug/l | <5.0 |
| 1,1-Dichloroethane, ug/l | <5.0 |
| Trans-1,2-Dichloroethylene, ug/l | <5.0 |
| cis-1,2-Dichloroethylene, ug/l | <5.0 |
| Chloroform, ug/l | <5.0 |
| 1,2-Dichloroethane, ug/l | <5.0 |
| 2-Butanone (MEK), ug/l | <50 |
| 1,1,1-Trichloroethane, ug/l | <5.0 |
| Carbon Tetrachloride, ug/l | <5.0 |
| Vinyl Acetate, ug/l | <10 |
| Bromodichloromethane, ug/l | <5.0 |
| 1,1,2,2-Tetrachloroethane, ug/l | <5.0 |
| 1,2-Dichloropropane, ug/l | <5.0 |
| trans-1,3-Dichloropropene, ug/l | <5.0 |
| Trichloroethene, ug/l | <5.0 |
| Dibromochloromethane, ug/l | <5.0 |

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Project: SL Level II Example Report
Sampled By: Client

REPORT OF RESULTS



| LOG NO | SAMPLE DESCRIPTION , LIQUID SAMPLES | DATE SAMPLED |
|---|---|---|
| FLQAP2-1 | Water Sample | 05-12-94 |

| PARAMETER | FLQAP2-1 |
|---|---|
| 1,1,2-Trichloroethane, ug/l | <5.0 |
| Benzene, ug/l | <5.0 |
| cis-1,3-Dichloropropene, ug/l | <5.0 |
| 2-Chloroethylvinyl Ether, ug/l | <50 |
| Bromoform, ug/l | <5.0 |
| 2-Hexanone, ug/l | <50 |
| 4-Methyl-2-pentanone (MIBK), ug/l | <50 |
| Tetrachloroethene, ug/l | <5.0 |
| Toluene, ug/l | <5.0 |
| Chlorobenzene, ug/l | <5.0 |
| Ethylbenzene, ug/l | <5.0 |
| Styrene, ug/l | <5.0 |
| Xylenes, ug/l | <5.0 |
| Surrogate - Toluene-d8 | 94 % |
| Surrogate - 4-Bromofluorobenzene | 100 % |
| Surrogate - 1,2-Dichloroethane-d4 | 92 % |
| Date Analyzed | 05.13.94 |
| Prep or Extraction Date | 05.13.94 |

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REPORT OF RESULTS



LOG NO SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES

FLQAP2-2 Method Detection Limit (MDL)

| PARAMETER | FLQAP2-2 |
|---|---|
| Volatiles by GC/MS (8240) | |
| Chloromethane, ug/l | 4.5 |
| Bromomethane, ug/l | 2.2 |
| Vinyl Chloride, ug/l | 2.8 |
| Chloroethane, ug/l | 3.5 |
| Methylene Chloride (Dichloromethane), ug/l | 1.9 |
| Acetone, ug/l | 7.1 |
| Carbon Disulfide, ug/l | 1.1 |
| 1,1-Dichloroethene, ug/l | 1.7 |
| 1,1-Dichloroethane, ug/l | 0.56 |
| Trans-1,2-Dichloroethylene, ug/l | 1.3 |
| cis-1,2-Dichloroethylene, ug/l | 1.1 |
| Chloroform, ug/l | 0.62 |
| 1,2-Dichloroethane, ug/l | 0.56 |
| 2-Butanone (MEK), ug/l | 3.2 |
| 1,1,1-Trichloroethane, ug/l | 0.75 |
| Carbon Tetrachloride, ug/l | 0.54 |
| Vinyl Acetate, ug/l | 1.8 |
| Bromodichloromethane, ug/l | 0.37 |
| 1,1,2,2-Tetrachloroethane, ug/l | 1.4 |
| 1,2-Dichloropropane, ug/l | 2.4 |
| trans-1,3-Dichloropropene, ug/l | 0.59 |
| Trichloroethene, ug/l | 1.6 |
| Dibromochloromethane, ug/l | 0.53 |

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REPORT OF RESULTS



LOG NO SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES

FLQAP2-2 Method Detection Limit (MDL)

| PARAMETER | FLQAP2-2 |
|---|---|
| 1,1,2-Trichloroethane, ug/l | 0.70 |
| Benzene, ug/l | 1.1 |
| cis-1,3-Dichloropropene, ug/l | 0.59 |
| 2-Chloroethylvinyl Ether, ug/l | 1.7 |
| Bromoform, ug/l | 0.98 |
| 2-Hexanone, ug/l | 3.6 |
| 4-Methyl-2-pentanone (MIBK), ug/l | 2.7 |
| Tetrachloroethene, ug/l | 0.79 |
| Toluene, ug/l | 1.4 |
| Chlorobenzene, ug/l | 0.55 |
| Ethylbenzene, ug/l | 0.65 |
| Styrene, ug/l | 4.8 |
| Xylenes, ug/l | 1.3 |

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REPORT OF RESULTS

Page 5

| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES |
|---|---|
| FLQAP2-3 | Method Blank |
| FLQAP2-4 | Lab Control Standard (LCS) % Recovery |
| FLQAP2-5 | Matrix Spike (MS) % Recovery |
| FLQAP2-6 | Matrix Spike Duplicate (MSD) % Recovery |
| FLQAP2-7 | Precision (% RPD for MS/MSD) |

| PARAMETER | FLQAP2-3 | FLQAP2-4 | FLQAP2-5 | FLQAP2-6 | FLQAP2-7 |
|---|---|---|---|---|---|
| Volatiles by GC/MS (8240) | | | | | |
| Chloromethane, ug/l | <10 | --- | --- | --- | --- |
| Bromomethane, ug/l | <10 | --- | --- | --- | --- |
| Vinyl Chloride, ug/l | <10 | --- | --- | --- | --- |
| Chloroethane, ug/l | <10 | --- | --- | --- | --- |
| Methylene Chloride (Dichloromethane), ug/l | <5.0 | --- | --- | --- | --- |
| Acetone, ug/l | <50 | --- | --- | --- | --- |
| Carbon Disulfide, ug/l | <5.0 | --- | --- | --- | --- |
| 1,1-Dichloroethene, ug/l | <5.0 | 98 % | 100 % | 98 % | 2.0 % |
| 1,1-Dichloroethane, ug/l | <5.0 | --- | --- | --- | --- |
| Trans-1,2-Dichloroethylene, ug/l | <5.0 | --- | --- | --- | --- |
| cis-1,2-Dichloroethylene, ug/l | <5.0 | --- | --- | --- | --- |
| Chloroform, ug/l | <5.0 | --- | --- | --- | --- |
| 1,2-Dichloroethane, ug/l | <5.0 | --- | --- | --- | --- |
| 2-Butanone (MEK), ug/l | <50 | --- | --- | --- | --- |
| 1,1,1-Trichloroethane, ug/l | <5.0 | --- | --- | --- | --- |
| Carbon Tetrachloride, ug/l | <5.0 | --- | --- | --- | --- |
| Vinyl Acetate, ug/l | <10 | --- | --- | --- | --- |
| Bromodichloromethane, ug/l | <5.0 | --- | --- | --- | --- |

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REPORT OF RESULTS



| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES |
|---|---|
| FLQAP2-3 | Method Blank |
| FLQAP2-4 | Lab Control Standard (LCS) % Recovery |
| FLQAP2-5 | Matrix Spike (MS) % Recovery |
| FLQAP2-6 | Matrix Spike Duplicate (MSD) % Recovery |
| FLQAP2-7 | Precision (% RPD for MS/MSD) |

| PARAMETER | FLQAP2-3 | FLQAP2-4 | FLQAP2-5 | FLQAP2-6 | FLQAP2-7 |
|---|---|---|---|---|---|
| 1,1,2,2-Tetrachloroethane, ug/l | <5.0 | --- | --- | --- | --- |
| 1,2-Dichloropropane, ug/l | <5.0 | --- | --- | --- | --- |
| trans-1,3-Dichloropropene, ug/l | <5.0 | --- | --- | --- | --- |
| Trichloroethene, ug/l | <5.0 | 92 % | 98 % | 103 % | 2.5 % |
| Dibromochloromethane, ug/l | <5.0 | --- | --- | --- | --- |
| 1,1,2-Trichloroethane, ug/l | <5.0 | --- | --- | --- | --- |
| Benzene, ug/l | <5.0 | 100 % | 102 % | 97 % | 5.0 % |
| cis-1,3-Dichloropropene, ug/l | <5.0 | --- | --- | --- | --- |
| 2-Chloroethylvinyl Ether, ug/l | <50 | --- | --- | --- | --- |
| Bromoform, ug/l | <5.0 | --- | --- | --- | --- |
| 2-Hexanone, ug/l | <50 | --- | --- | --- | --- |
| 4-Methyl-2-pentanone (MIBK), ug/l | <50 | --- | --- | --- | --- |
| Tetrachloroethene, ug/l | <5.0 | --- | --- | --- | --- |
| Toluene, ug/l | <5.0 | 99 % | 89 % | 98 % | 9.5 % |
| Chlorobenzene, ug/l | <5.0 | 104 % | 94 % | 94 % | 6.2 % |
| Ethylbenzene, ug/l | <5.0 | --- | --- | --- | --- |
| Styrene, ug/l | <5.0 | --- | --- | --- | --- |
| Xylenes, ug/l | <5.0 | --- | --- | --- | --- |
| Surrogate - Toluene-d8 | 98 % | --- | --- | --- | --- |
| Surrogate - 4-Bromofluorobenzene | 94 % | --- | --- | --- | --- |
| Surrogate - 1,2-Dichloroethane-d4 | 100 % | --- | --- | --- | --- |
| Date Analyzed | 05.13.94 | --- | --- | --- | --- |
| Prep or Extraction Date | 05.13.94 | --- | --- | --- | --- |

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: SE-FLQAP2

Received: 12 MAY 94

Dr. James Andrews
Savannah Laboratories
P.O. Box 13548
Savannah, Georgia 31406

Project: SL Level II Example Report
Sampled By: Client

REPORT OF RESULTS

Page 7

| LOG NO | SAMPLE DESCRIPTION , QC REPORT FOR LIQUID SAMPLES |
|---|---|
| FLQAP2-3 | Method Blank |
| FLQAP2-4 | Lab Control Standard (LCS) % Recovery |
| FLQAP2-5 | Matrix Spike (MS) % Recovery |
| FLQAP2-6 | Matrix Spike Duplicate (MSD) % Recovery |
| FLQAP2-7 | Precision (% RPD for MS/MSD) |

| PARAMETER | FLQAP2-3 | FLQAP2-4 | FLQAP2-5 | FLQAP2-6 | FLQAP2-7 |
|---|---|---|---|---|---|

Methods: EPA SW-846

J. W. Andrews, Ph. D.

Final Page Of Report

## CLP EQUIVALENT SUPPLEMENTAL DATA PACKAGE INCLUDES

1. Run sequence log
2. Five-point curves or data with chromatograms or instrument printouts
3. Daily check standard/continuing calibration form and standard chromatograms or instrument printouts
4. Sample spike, (LCS and matrix), method blank chromatograms, quant reports, and/or instrument printouts
5. Project narrative

## 13.0 CORRECTIVE ACTION

Corrective action will be initiated when data are determined to be questionable or QC criteria are out of control. For routine operational problems, the analysts correct the problem and note the problem/corrective action on the run log or bench data sheet.

When formal corrective action is required, a nonconformance report (NCR) is prepared on the NCR form (Figure 13.1). NCRs are required for:

1. Chronic problems which could affect data quality or production and are due to equipment or facility disrepair or inadequacy, improper training, employee attitude or ineptness, supply, reagent or standard quality, SOP inadequacy or error, or any other problems which could be corrected by management. NCRs for this type of problem should be prepared by the analyst and channelled through the department manager/lab manager to the laboratory director. The box by "Request Lab Director's Attention" should be checked and final action should be taken by the lab director.

2. For uncorrectable nonconformance problems which are noted by an asterisk (*) in Table 13.1 which could affect the quality of report data, corrective action is initiated by the analyst or department manager. Before an NCR is prepared, the analyst/department manager will review raw data, calculations, and operating conditions of the instrument. If this does not resolve the problem, analysis of the batch (samples plus QC samples) is repeated provided sufficient sample is available. If data are submitted in cases where QC is not in compliance, this is documented in a case narrative which is part of the data report. The action must be approved by the project manager who submits the report.

3. When QA problems are discovered during internal data review, internal system audits, client inquiries, or external data review or validation, an NCR is prepared by the QA, project, or department manager, as appropriate, and is filed in the QA department.

The status of all NCRs is tracked through an NCR registry which lists the NCR number, date initiated, originator initials, department, SL log number, nonconformance and corrective action codes, and closeout date.

Copies of completed, closed-out NCRs are filed in departmental notebooks. The original NCRs are filed in the QA department.

Control charts are periodically reviewed and evaluated by department managers or departmental staff. All quality control data at Savannah Laboratories are evaluated on a "real-time" basis by laboratory staff against annually updated limits. This evaluation is done prior to control charting. Thus, control charts are used only to track trends and satisfy certain agency requirements. Corrective action is taken as required if control chart trends do not meet specified agency protocols.

Corrective action responses to agencies addressing any parameters found to be outside the acceptance limits in WP, WS or similar performance audits are made in a formal corrective action response letter. This letter details the results of data review and investigation, describes causative factors if found, and the corrective action taken to address any problems uncovered in the review or investigation. Copies of the corrective action letters are appended to the performance audit results and submitted when results are requested. Blind performance audit samples are generally analyzed as corrective action to unacceptable results.

Savannah Laboratories will abide by any corrective action deemed necessary by all pertinent agencies.

# FIGURE 13.1

## NONCONFORMANCE REPORT (NCR)

NCR #_____

Date Initiated: _____ Client ID: _____ Client _____

SL Log No. _____ Analysis: _____ Date of Analysis: _____

Analyst: _____ Department Manager: _____ Project Manager: _____

Nonconformance Code: _____ Description: _____

_____

_____

_____

_____

_____

_____

_____

Project Manager's Initials: _____ Date: _____

QA Manager's Initials: _____ Date: _____

☐ Request Lab Director's attention LD Initials: _____ Date: _____

Corrective Action Code: _____ Description: _____

_____

_____

_____

_____

_____

Corrective Action Completed: Department Manager's Initials: _____ Date: _____

QA Manager's Initials: _____ Date: _____

Copies of this report should be filed in the departmental Corrective Action Notebook and in the report file. The original is retained by the QA department.

FAN002:04.13.93:0

**TABLE 13.1**

CORRECTIVE ACTION

| | QC Activity | Acceptance Criteria | Recommended Corrective Action |
|---|---|---|---|
| * | GC/MS tuning or ICP/AA | Per SOPs or Chapter 9.0 | Do not analyze samples unless criteria are met. |
| * | Initial calibration standards | Per SOPs or Chapter 9.0 | Reanalyze standards. If still unacceptable, remake standards or instrument corrections. |
| * | QC check/continuing calibration standard | Per SOPs, See Chapter 9.0 | Reanalyze standard. If still unacceptable, remake standards, or recalibrate. |
| * | Method blank | < PQL (for CLP procedures, use SOW guidelines) | Reanalyze blank. If problem, determine source of contamination. If necessary or possible, redigest/extract batch and reanalyze. |
| * | Surrogate recovery (GC/MS semivolatiles) | Tables 5.1 and 5.2. One acid and one base may be out of criteria. | Follow method guidelines. |
| * | Surrogate recovery (GC/MS volatiles) | 0 outside criteria in Tables 5.1 and 5.2 | Follow SW-846 method or CLP guidelines. |
| * | Surrogate recovery GC or LC | Tables 5.1 and 5.2 | Check for possible matrix interferences or other causes and follow method guidelines. |
| | Matrix spike recoveries | Tables 5.1 and 5.2** | Check for possible matrix interferences or other causes. If still out, evaluate LCS. |
| * | Lab control standard (LCS) recoveries | In-house or protocol-required limits.** | Check calculations, reanalyze standards, and if necessary or possible, redigest or extract batch and reanalyze. |
| * | Internal standards (organics) | Method or protocol-required limits*** | Follow method or protocol guidelines |

* If criteria cannot be met, an NCR must be prepared and approved by QA manager and project manager.

** For projects subject to Florida DEP QAS criteria, matrix spikes are utilized for control criteria. If matrix spikes are out, LCSs are evaluated.

*** Not usually required for 500, 600 and 8000 series methods.

# 14.0 PERFORMANCE AND SYSTEM AUDITS

Performance and system audits are performed in each laboratory throughout the year.

## 14.1 Internal System Audits

### 14.1.1 Corporate Audits

Periodically, as directed by the president or corporate QA manager, an on-site systems audit is conducted on all or selected aspects of the laboratory and field operations at each facility. This audit is coordinated by the president and the corporate QA managaer and is conducted by a multiperson audit team which may be comprised of individuals with expertise in the organic, inorganic, QA, project custody, data management, and field sampling areas, the corporate safety director, and a representative from the business office. This on-site audit may be supplemented by review of reports and QA data in the LIMS network and review of selected data packages. An audit report is issued by the team, to the president within two weeks of completion of the audit and a copy is provided by the QA manager to the lab director.

The corporate system audits consist of an examination of laboratory procedures and documentation to ensure that the entire laboratory is being operated according to established protocol. The auditors will audit that the proper frequency of quality control standards, spikes, duplicates, etc., are incorporated with each sample analytical run, and all results are documented, up to date, and accessible for review. Control charts are checked to ensure their proper maintenance. Calculations are spot checked and data procedures are reviewed to ensure SOPs are being followed, and special attention is given to calibration procedures. The systems audit check also ascertains whether proper documentation exists to trace working analytical standards back to stock standards. Finally, analysts' techniques are evaluated against techniques as defined in the SOPs, the SL Training SOP, and recognized good laboratory practices.

The QA manager and laboratory director coordinate the response to the audit and are responsible for documenting required corrective action.

### 14.1.2 Laboratory Audits

Semiannual internal laboratory systems audits are conducted by QA managers at each division. The scope and depth of the audit are determined by each QA manager according to requirements of the division. Prepared checklists are generally used to assist the auditing process. These checklists are periodically changed to audit various aspects of the operation of the laboratory and to ensure they are current with all quality control procedures. An internal laboratory systems audit may include any of the audit items of the corporate internal systems audit described above. It may also consist of or include tracing an SL log number through the laboratory and auditing all associated quality control documentation. The audit may check that corrective actions for past external on-site inspections have been fully implemented. A report of the audit is prepared and submitted to the lab director and corporate QA manager. An

example page from an internal laboratory systems audit checklist is given in Figure 14.1. This particular example contains quality assurance questions directed to the custody section of the laboratory.

### 14.1.3 Field Audits

An internal field systems audit of each divisional field sampling operation is performed annually. These audits are conducted by each field/sampling manager and may include all aspects of field sampling operations. An example page from an internal field systems audit checklist is given in Figure 14.2.

## 14.2 External System Audits

Each laboratory may be certified by a number of state agencies, governmental agencies or private certification programs. Most of these programs require continuing on-site system audits of the laboratory. The laboratories submit to these on-sites as required by these certifying agencies and organizations and respond to any noted nonconformances with corrective actions.

Field system audits are performed periodically by various federal and state regulatory agencies. Field sampling and documentation procedures are examined to ensure sampling is performed according to the agency protocols.

## 14.3 Performance Audits

### 14.3.1 Internal Performance Audits

Internal performance audits or evaluations are routinely performed by Savannah Laboratories. Single blind performance audits are employed for several reasons. One purpose is to provide corrective action for parameters judged to be unacceptable on WP, WS or other major external performance audits. Periodic internal performance audits are also used to test parameters that are not routinely tested by external performance audits. Finally, single blind performance audits are employed to satisfy certain certification requirements, to satisfy auditors' specific requests for performance audit samples, or provide additional evidence of data quality to clients with specific questions regarding laboratory performance.

In addition to internal single blind performance audits, Savannah Laboratories performs double blind performance audits periodically. In this type audit (which are initiated by the corporate QA manager), analysts do not know a sample's identity as an audit sample. This performance audit tests parameters included in most major methods.

FIGURE 14.1

| LABORATORY INTERNAL SYSTEMS AUDIT CHECKLIST | | |
|---|---|---|
| | Yes | No |
| I. CU (Custody) Section<br>Contacts: _____ | | |
| A. Are comprehensive, up-to-date SOPs available for this section?<br>Comments: _____ | | |
| B. Are custody logbooks properly maintained?<br>Comments: _____ | | |
| C. Is sample preservation checked and documented on arriving samples?<br>Comments: _____ | | |
| D. Is the temperature of each lab pack recorded and documented upon arrival?<br>Comments: _____ | | |
| E. Are sample custody excursion forms used if required?<br>Comments: _____ | | |
| F. Are chain-of-custody forms properly filed?<br>Comments: _____ | | |

FIGURE 14.2

| FIELD INTERNAL SYSTEMS AUDIT CHECKLIST | | |
|---|---|---|
| | Yes | No |
| I. General Procedures<br><br>Contacts: _____<br>_____ | | |
| A. Were sampling locations identified by map or facility tour by the client?<br><br>Comments: _____<br>_____ | | |
| B. Were the wells locked?<br><br>Comments: _____<br>_____ | | |
| C. Were samples collected starting with the least likely contaminated and proceeding to the most likely contaminated?<br><br>Comments: _____<br>_____ | | |
| D. Were new disposable rubber gloves worn during collection of all samples?<br><br>Comments: _____<br>_____ | | |
| E. Was sampling equipment wrapped in aluminum foil and protected from possible contamination prior to sample collection?<br><br>Comments: _____<br>_____ | | |

### 14.3.2 External Performance Audits

All facilities participate in each of the following performance evaluation audits semiannually:

1. U. S. EPA Water Supply Study (WS Series).
2. U. S. EPA Water Pollution Study (WP Series).

Additionally, the laboratories participate in several regulatory agency, certifying group, or client requested performance audits. Results from these performance audits are reported to management, agencies, and clients as required.

Results from agency performance audits are supplied to clients upon request.

# 15.0 QUALITY ASSURANCE REPORTS

## 15.1 Internal Reports

The QA manager of each division is responsible for providing quality assurance reports to division and/or corporate management. QA managers report all performance evaluation results (such as WP and WS study results) to the laboratory director and corporate QA manager. These submissions include any required corrective action responses and are made upon completion of the responses.

Reports are also made to the laboratory director and corporate QA manager of any external audits or on-site inspections of each laboratory that result in a written report from the auditor or inspector. If the inspection requires corrective actions, the corrective action response will be included in the reports.

Reports of any changes in certification status are reported to the marketing director, corporate QA manager, and all laboratory directors and vice presidents. New or updated certificates of certification and new or revised certified parameter lists are submitted as soon as they are received by the division QA manager.

An annual report addressing any revisions to the QA plan and including data for updating control limits and MDLs is due two months prior to the anniversary date of the QA plan and is submitted to the vice presidents and corporate QA manager. Any suggestions for additions, deletions, or modifications to the text, updated equipment lists and organizational charts, method/parameter additions or deletions, and any required method validation studies are submitted with this report.

Results of semiannual internal systems audits are reported to the laboratory director and the corporate QA manager as completed. These reports are maintained in both the divisional and corporate QA files.

Requests for SOP changes or new SOPs are made to the corporate QA manager as required. Technical changes to the SOPs are approved by the corporate organics or inorganics manager as appropriate.

QA managers from all divisions meet periodically to report on and discuss issues of common concern. These topics may include SL's quality assurance plan, SOPs, chronic nonconformances, training, control charts, document control, and general quality control issues. The president is present during these meetings so that decisions reached may be implemented with full understanding and support of upper management. Each QA manager reports on QA issues that may be specific to their division and resolutions are suggested to any QA problems that manager has identified.

The corporate QA manager reviews all QA reports and summarizes them in a presentation to the president and vice presidents.

## 15.2 External Reports

Monthly progress reports are made to all required agencies or offices such as HAZWRAP, NEESA and the UMTRA Project Office. The scope and content of these reports is generally defined by the agency or office.

When required, QA reports are submitted to DEP QAS as provided for in Table VI, Appendix D of DER-QA-001/90. Each project-specific report is submitted at the recommended frequency, and includes a title page, a table of contents, specific information for either the performance or systems audits, significant QA/QC problems, and corrective action status as described in Appendix D. If no project audits are performed and no significant QA/QC problems occur for the duration of a project requiring a DEP QA report, a letter stating these facts will be submitted in lieu of the QA report.

# C APP IX B

ffic C nce,
and re alibratio
rutin uction

## HOW TO USE YOUR POLYMER BODY, SEALED REFERENCE COMBINATION pH ELECTRODE

Your new polymer body combination electrode affords a unique ease of use. Because the pH bulb is recessed inside the polymer body, the electrode can be allowed to rest against the bottom of a beaker without damaging the glass bulb. In many measurements this recessed bulb design eliminates the need for electrode holders and the electrode actually can be used as a stirring rod. The sealed reference design eliminates the need to add filling solutions, and minimizes reference dryout.

### HELPFUL OPERATING TECHNIQUES

1. As shipped, the electrode tip is covered by a protective cap which serves both to keep the reference from drying and to prevent breakage. This cap is a snug fit and it contains a pressure relief hole to facilitate removal and installation. As supplied, this hole is covered by a piece of vinyl tape to retain moisture inside the cap. Before removing or reinstalling this cap, the tape must be removed to expose the pressure relief hole.
2. During shipment, the air pocket in the electrode's stem may move into the bulb area. If bubbles are seen in the bulb area, hold the electrode by its cap and shake downwards as is done with a clinical thermometer.
3. Vigorously stir the electrode in the sample, buffer or rinse solution. This action will bring solution to the electrode's surface more quickly and improve speed of response.
4. After exposure to a sample, buffer or rinse solution, shake the electrode with a snap motion to remove residual drops of solution. This action will minimize contamination from carryover.
5. As a rinse solution, use a part of the next sample or buffer which is to be measured. This action also will minimize contamination from carryover.
6. When calibrating, use a buffer close in value to that expected from the sample. This action will minimize any span errors.
7. Keep buffers and samples at the same temperature. This action will eliminate the need to correct values for temperature effects.
8. pH readings stabilize faster in some solutions than others; allow time for the reading to stabilize. In general, buffers provide stable readings in several seconds (tris buffers take somewhat longer) while samples usually take longer.
9. Keep in mind that all pH electrodes "age" with time. Aging is characterized by shortened span and slower speed of response. The pH meter "slope" (span) control can be adjusted to compensate for electrode span errors but will not affect speed of response. When the slope control can no longer be adjusted to compensate for the span errors, the electrode should be cleaned and/or reconditioned. If reconditioning does not restore performance, the electrode should be replaced.

### CALIBRATION

The frequency of calibration is a function of both the electrode and the pH meter. They should be calibrated together with the calibration frequency determined by experience. The following step-wise procedure has been found useful:

1. Remove the vinyl tape from the electrode's protective cap to open the pressure relief hole and then remove and save the cap.
2. Vigorously stir the electrode in a rinse solution.
3. Shake the electrode with a snap action to remove residual drop of solution.
4. Vigorously stir the electrode in a 7.0 buffer and allow the electrode to rest against the beaker's side.
5. Allow the reading to stabilize and use the pH meter zero adjustment to make the meter read the buffer value (remember to adjust to the buffer's pH value at the temperature of the buffer).
6. Repeat steps 2 & 3.
7. Vigorously stir the electrode in a second buffer whose value is near that expected from the sample, and allow the electrode to rest against the beaker's side.
8. Allow the reading to stabilize, and use the pH meter slope adjustment to make the meter read the buffer value (remember to adjust to the buffer's pH value at the temperature of the buffer).
9. Repeat steps 2 thru 5, and then repeat steps 2 & 3 and 7 & 8. It may be necessary to work back and forth between the two buffers several times to secure adjustments which do not require changing between buffers.
10. If the unit is in frequent use, with the same electrode, steps 7 & 8 (slope adjustment) need not be repeated more than once a day, but steps 2 thru 5 should be repeated for each group of readings.

## OPERATION

Operating steps are similar to calibration procedures and are as follows:

1. Remove the vinyl tape from the electrode's protective cap to open the pressure relief hole and then remove and save the cap.
2. Vigorously stir the electrode in a rinse solution.
3. Shake the electrode with a snap action to remove residual drops of solution.
4. Vigorously stir the electrode in the sample and allow the electrode to rest against the beaker's wall.
5. Allow the reading to stabilize and then take the reading.
6. Repeat these steps for each sample determination.
7. Between readings, place the electrode in a beaker containing about 2 cm (1 inch) of distilled or tap water.

## ELECTRODE STORAGE

When pH readings are made infrequently, for example, several days or weeks apart, the electrode can be stored simply by replacing its protective cap. Make certain that the cotton inside the cap is wet (use distilled water), that the cap pressure relief hole is open and slowly push the cap into position. Then, cover the hole in the cap's side with a piece of tape. For very long term storage, taping the top of the cap to the electrode's body will provide additional protection against water loss.

## ELECTRODE CLEANING

Coating of the pH bulb can lead to erroneous readings including shortened span. The type of coating will determine the cleaning technique. Soft coatings can be removed by vigorous stirring or by use of a squirt bottle. Organic chemical or hard coatings should be chemically removed. In no case should the bulb be mechanically cleaned, because abrasion can lead to permanent damage.

## RECONDITIONING

When reconditioning is required due to electrode aging (see Helpful Operating Techniques, Part 9), the following chemical treatments should be tried. They are presented in the order of the severity of their attack on the pH glass.

NOTE: Use proper precautions when handling these hazardous chemicals.

1. Immerse the electrode tip in 0.1N HCl for 15 seconds, rinse in tap water and then immerse tip in 0.1N NaOH for 15 seconds and rinse in tap water. Repeat this sequence several times and then recheck electrode performance. If performance has not been restored, try Step 2.

2. Immerse the tip in a 20% solution of $NH_4F.HF$ (ammonium bifluoride) for 2 to 3 minutes, rinse in tap water and recheck performance. If performance has not been restored, try Step 3.

3. Immerse electrode tip in 10% HF for 10 to 15 seconds, rinse well in tap water, quickly rinse in 5N HCl, rinse well in tap water and recheck performance. If performance has not been restored it is time to get a replacement electrode.

## CALIBRATION

Temperature and Conductance are factory calibrated. You may check conductance accuracy with a solution of known conductance and recalibrate, if necessary.

See Figure 2. To recalibrate conductance, remove black plug revealing the adjustment potentiometer screw. Add standard solution to cup, discard and refill. Repeat procedure until the digital display indicates the same value twice in a row. Adjust the potentiometer until the digital display indicates the known value of conductance. To increase the digital display reading, turn the adjustment potentiometer screw counterclockwise (clockwise to decrease).

To standardize the pH electrode and meter, place the pH electrode in the 7.0 buffer bottle. Adjust the "ZERO" potentiometer on the face of the tester so that the digital display indicates 7.00.

Then place the pH electrode in the 4.0 or 10.0 buffer bottle (depending on where you expect the actual measurement to be). Adjust the "SLOPE" potentiometer on the face of the tester so that the digital display indicates the value of the buffer chosen.

NOTE: There is interaction between the "ZERO" and "SLOPE" adjustments, so the procedure should be repeated several times.

# Remedial Design for Operable Unit No. 1 Health and Safety Plan

# at

# Woolfolk Chemical Works Superfund Site Fort Valley, Georgia

August 1994

*Prepared by*

**ERM-Southeast, Inc.**
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Kennesaw, Georgia 30144

*TABLE OF CONTENTS*


| | | |
|---|---|---|
| ***1.0*** | ***INTRODUCTION*** | ***1-1*** |
| *1.1* | *PROJECT BACKGROUND AND PLANNED SITE ACTIVITIES* | *1-2* |
| *1.2* | *PHYSICAL HAZARDS* | *1-3* |
| | *1.2.1 Heat Stress/Cold Exposure* | *1-3* |
| | *1.2.2 Heavy Machinery/Equipment* | *1-5* |
| | *1.2.3 Construction Materials and Site Refuse* | *1-5* |
| *1.3* | *CHEMICAL HAZARDS* | *1-5* |
| *1.4* | *APPLICABLE REGULATIONS* | *1-6* |
| ***2.0*** | ***PROJECT ORGANIZATION AND RESPONSIBILITIES*** | ***2-1*** |
| ***3.0*** | ***MEDICAL MONITORING AND PERSONNEL TRAINING REQUIREMENTS*** | ***3-1*** |
| *3.1* | *PERSONNEL TRAINING* | *3-3* |
| *3.2* | *AIR MONITORING AT SITE* | *3-4* |
| *3.3* | *EXPLOSIVITY* | *3-5* |
| ***4.0*** | ***PERSONAL PROTECTIVE EQUIPMENT*** | ***4-1*** |
| *4.1* | *PROTECTIVE EQUIPMENT* | *4-1* |
| ***5.0*** | ***DECONTAMINATION*** | ***5-1*** |
| ***6.0*** | ***SITE ACCESS AND SITE CONTROL*** | ***6-1*** |
| ***7.0*** | ***EMERGENCY RESPONSE*** | ***7-1*** |
| *7.1* | *ACCIDENTS AND INJURIES* | *7-1* |
| *7.2* | *COMMUNICATIONS* | *7-4* |
| *7.3* | *DIRECTIONS TO NEAREST HOSPITAL* | *7-4* |

| | | |
|---|---|---|
| ***8.0*** | ***SPECIAL PRECAUTIONS AND PROCEDURES*** | ***8-1*** |
| *8.1* | *HEAVY MACHINERY/EQUIPMENT* | *8-1* |
| *8.2* | *SITE EVACUATION* | *8-2* |
| *8.3* | *GENERAL SAFETY PRACTICES* | *8-2* |
| ***9.0*** | ***SITE DOCUMENTATION*** | ***9-1*** |
| ***10.0*** | ***PROCEDURES FOR PROTECTING THIRD PARTIES*** | ***10-1*** |
| *10.1* | *SUBCONTRACTORS AND OTHER PERSONNEL* | *10-1* |
| *10.2* | *AREA CONDITIONS* | *10-1* |

## *LIST OF FIGURES*


| | | |
|---|---|---|
| *Figure 7-1* | *Route to Peach County Hospital* | *7-5* |
| *Figure 9-1* | *Daily Field Activity Form* | *9-2* |
| *Figure 9-2* | *ERM Incident Report* | *9-3* |

## *LIST OF TABLES*


*Table 1-1 Known Soil Contaminants* 1-4

*Table 1-2 Potential Health and Safety Hazards* 1-5

*Table 1-3 Applicable Standards* 1-8

*Table 3-1 Medical Monitoring Examinations* 3-2

*Table 7-1 Emergency Response* 7-2,3

*Table 10-1 Subcontractor Occupational Safety and Health Certification* 10-2

## *LIST OF APPENDICES*


| | |
|---|---|
| *A* | *Personal Protective Equipment* |
| *B* | *Decontamination* |
| *C* | *Heat Stress Guidelines* |
| *D* | *Cold Stress* |
| *E* | *Excavation, Trenching, and Shoring* |
| *F* | *MSDSs for Lead and Arsenic* |

## *1.0 INTRODUCTION*

This Health and Safety Plan (HSP) is intended to provide a framework for the safe conduct of ground water monitoring well installation and related activities at the Woolfolk Chemical Works Site. As such, this plan provides procedures to be followed to prevent accidents due to physical hazards and to reduce the potential for exposure of personnel to chemical contaminants which may be present in the air, water, and soil.

This HSP is intended to provide for the protection of personnel performing the field activities at the site. Unauthorized personnel will, to the extent feasible, be excluded from the work areas at all times. If necessary, exclusion zones with access corridors will be established to prevent unauthorized personnel from entering potentially contaminated areas.

It is important that all personnel participating in the activities at the site adhere to the health and safety protocols specified in this plan. Additionally, all personnel are to maintain a high level of safety consciousness so that immediate corrective actions can be taken to solve or avoid potentially threatening conditions or practices. It is essential that all personnel associated with this project review this plan to enhance the level of health and safety during site activities. All personnel will be provided with a copy of the HSP. In addition, all field personnel and other persons entering the site will be required to sign the HSP Site Log to confirm that they have reviewed, understood, and will comply with the HSP.

ERM EnviroClean-Southeast, Inc., (ERM) has prepared this HSP for use at the Woolfolk Chemical Works Site located in Fort Valley, Georgia. ERM will provide copies of the HSP to its subcontractors working on the Site. ERM's preparation of the HSP is in conformity with that degree of care ordinarily exercised by environmental professionals providing such services. Each

subcontractor shall review the HSP to ensure its appropriateness for the work being conducted by the subcontractor and any use by the subcontractor of the HSP shall be in addition to the subcontractor's maintaining a safety program in accordance with the subcontractor's established practices. Each subcontractor shall have sole responsibility for implementing its own safety programs. ERM shall not be responsible for supervising the implementation of the HSP by any subcontractor's or subcontractors' employees. The services performed by ERM shall in no way inure to the benefit of any subcontractor so as to give rise to any cause of action to any subcontractor or its employees.

## *1.1 PROJECT BACKGROUND AND PLANNED SITE ACTIVITIES*

The Woolfolk Chemical Works Site is located in Fort Valley, Georgia. The facility has been in operation since 1910 making both inorganic and organic pesticides. During this operation the facility has used lead, arsenic, and has made several different agricultural chemicals to include; DDT, toxaphene, chlordane, heptachlor, methyl parathion, dieldrin, aldrin and matalhion. Contamination of soil and ground water at the site and the surrounding area has resulted. A site location map is provided in Figure 1-1 of the Remedial Design Work Plan (the work plan).

Planned activities at the Woolfolk site include installation of additional ground water monitoring wells, construction activities associated with existing monitoring wells for which closure is planned, and conducting aquifer tests and ground water sampling at various designated monitoring wells associated with the site. Figure 1-2, provided in the work plan, depicts existing ground water monitoring wells currently located at the Woolfolk site. Figures 1-2, 2-4, 2-5, and 2-6, which are also provided in the work plan, provide schematic illustrations of existing or planned monitoring well locations where site work will take place during the Remedial Design phase. Figure 2-3 of the work plan illustrates the locations of

existing monitoring wells at the site for which closure is planned. Activities planned for the designated work zones are expected to be conducted in Level D protective gear. Level C protective attire and gear will be available and accessible in proximity to the work zone.

Table 1-1 provides the exposure limits and other information pertaining to contaminants present at the site.

## *1.2 PHYSICAL HAZARDS*

Physical hazards associated with the activities at the site will include the presence of heavy machinery and vehicular traffic secondary to site remediation operations at the Woolfolk Chemical Works site. Other potential hazards that are associated with site activities may include noise exposure, heat stress or cold exposure, and site refuse, and potential high ground water that has been observed by ERM to cause near "quick" conditions. Table 1-2 provides a summary of general hazards that may be present at the Woolfolk Chemical Works site with the associated precautions to be observed. Precautionary measures have been established to reduce these risks to a minimum during site activities.

### *1.2.1 Heat Stress/Cold Exposure*

Heat stress/cold exposure may pose a threat to the health and safety of site personnel. Work/rest regimens will be employed as necessary so that personnel do not suffer adverse effects from heat stress/cold exposure. Special clothing and an appropriate diet and fluid intake will be recommended to all site personnel to further reduce these temperature-related hazards. The work/rest regimes will be developed following the guidelines in the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values and Biological Exposure

## TABLE 1-1
## POTENTIAL SITE COMPOUNDS AND ASSOCIATED EXPOSURE INFORMATION

| Compound | CAS[a] | Exposure Limits[b] | Characteristics | Route of Exposure | Symptoms of Overexposure[c] | Target Organs |
|---|---|---|---|---|---|---|
| Acetone | 67-64-1 | PEL: 250 ppm (590 mg/m$^3$) IDLH: 20,000 ppm | Colorless liquid with fragrant mint-like odor | Inhalation, ingestion, skin contact | Irritation of eyes, nose, throat, & respiratory tract; headache; dizziness | Respiratory system, skin |
| Chlorobenzene | 108-90-7 | PEL: 75 ppm (350 mg/m$^3$) IDLH: 2,400 ppm | Colorless liquid with almond-like odor | Inhalation, ingestion, skin contact | Irritation of skin, eyes, nose; drowsiness; reduced coordination | Respiratory system, skin, eyes, liver, nervous system |
| Chloroform | 67-66-3 | PEL: 2 ppm (9.78 mg/m$^3$) IDLH: 1,000 ppm | Colorless with pleasant odor | Inhalation, ingestion, skin contact | Dizziness, nausea, confusion, irritation of eyes and skin, headache, fatigue cough | Liver, kidneys, heart, eyes, skin |
| Ethylbenzene | 100-41-4 | PEL: 100 ppm (435 mg/m$^3$) IDLH: 2,000 ppm | Colorless liquid with aromatic odor | Inhalation, ingestion, skin absorption, contact | Irritation of eyes and mucous membrane, headache, contact dermatitis, coma | Eyes, upper respiratory system, skin, central nervous system |
| Tetrachloroethene | 127-18-4 | PEL: 25 ppm (170 mg/m$^3$) IDLH: unknown | Clear, colorless liquid with mild, chloroform-like odor | Inhalation, ingestion, skin contact | Irritation of eyes, nose, throat; nausea; flushed face/neck; dizziness; liver damage | Liver, kidneys, eyes, upper respiratory system, central nervous system |
| Xylenes | 1330-20-7 | PEL: 100 ppm (435 mg/m$^3$) IDLH: 1,000 ppm | Colorless liquid with an aromatic odor | Inhalation, ingestion, skin contact, absorption | Dizziness; excitement; drowsiness; confusion; staggering gait; irritation of eyes, skin, nose, throat; nausea; vomiting; abdominal pain | Central nervous system, eyes, gastrointestinal tract, blood, liver, kidneys, skin |

[a] Chemical Abstract Service (CAS) Registry number.
[b] Exposure Limits = OSHA Permissible Exposure Limit (PEL) and Immediately Dangerous to Life and Health (IDLH) levels if established.
[c] Symptoms may include any or all listed, depending upon concentration, duration, and route(s) of exposure.

# TABLE 1-2

# POTENTIAL HEALTH AND SAFETY HAZARDS

| Hazard | Description | Location | Procedure Used to Monitor/Reduce Hazard |
|---|---|---|---|
| Heavy Equipment | Loaders, trucks, mixer. | Work zone and surrounding areas | Personnel maintain eye contact with operators; wear hard hats, safety shoes, and eye protection (as appropriate) during equipment operation. |
| Overhead/Underground Utilities | Electrical, sewer, gas, water. | Work zone and surrounding areas | Locate existing utilities prior to site operations; design installation of additional utilities so that they do not interfere with site operations. |
| Refuse and Materials | Construction refuse and construction materials. | Work zone and surrounding areas | Maintain clean work areas; dispose of refuse immediately; do not block access routes with materials. |
| Heat Producing/Electric Equipment | Generators/heavy equipment. | Work zone and surrounding areas | Operate equipment away from vegetation and other materials that may ignite; maintain fire-fighting equipment in the vicinity of operating equipment. |
| Heat Stress/Cold Exposure | Personnel working under extreme temperature are subject to adverse temperature-related effects. | Work zone and surrounding areas | Employ buddy system; visually monitor work partner for signs of heat stress, safety, or other hazard exposure; all site personnel monitor work conditions, establish work/rest regimens and appropriate diet. |
| Chemical Exposure | Personnel can be exposed to various compounds associated with the site. | Work zone and surrounding areas | Follow guidelines in HSP; be familiar with signs and symptoms of exposure and first aid procedures; report suspected over-exposure to supervisor immediately. |
| Heavy Traffic | Vehicular traffic. | Work zone and surrounding areas | Barricade heavy equipment and excavation areas from the general public; maintain eye contact with operator of all heavy equipment and vehicles entering and exiting the site; employ buddy system. |
| Fugitive Dust | Heavy equipment and associated activities may result in airborne dusts or mists | Work zone and surrounding areas | Follow HSP guidelines and observe soil conditions to assess airborne dust potential; if indicated, use wetting mists to control or reduce dust hazard. |
| Excessive Noise | Machinery/equipment may result in excessive noise levels | Work zone and surrounding areas | Follow HSP guidelines; increase visual appraisal of hazard potential to compensate for decreased ability to hear warning sounds; use hand signals and maintain eye contact with equipment operators. |

Indices for 1992-1993. See Appendix C for specific heat stress guidance and Appendix D for cold exposure guidelines.

### *1.2.2 Heavy Machinery/Equipment*

All personnel must remain aware of those site activities that involve the use of heavy equipment and machinery. Respiratory protection, ear plugs, and protective eyewear may be worn during site activities. This protective equipment significantly reduces peripheral vision and verbal communication of the wearer. Therefore, it is essential that all employees at the site exercise extreme caution during operation of equipment and machinery to avoid physical injury to themselves or others.

### *1.2.3 Construction Materials and Site Refuse*

All construction materials and site refuse should be contained in appropriate areas or facilities. Site personnel should make certain that fencing, cement, etc., are not scattered throughout the area of activity and that all trash and scrap materials are immediately and properly disposed of.

## *1.3 CHEMICAL HAZARDS*

The potential chemical hazards at the site are the result of the presence of hazardous substances. Table 1-1 lists the chemical compounds that are believed to be present at the site and that could potentially impact field conditions during ground water monitoring well installation and related field activities.

## *1.4 APPLICABLE REGULATIONS*

Federal and state agencies have established standards and guidelines addressing worker protection and safe work practices. These regulations are expected to impact the manner in which the site operations are conducted. Table 1-3 summarizes key regulations likely to be applicable to some of the field activities planned for the site.

**TABLE 1-3**
**APPLICABLE STANDARDS**

| Agency | Standard Reference | Subject of Regulation |
|---|---|---|
| Occupational Safety and Health Administration | 1910.20 | Recordkeeping |
| Occupational Safety and Health Administration | 1910.120 | Hazardous Waste Site Operations |
| Occupational Safety and Health Administration | 1910.134 | Respiratory Protection |
| Occupational Safety and Health Administration | 1910.1000 | Toxic and Hazardous Substances |
| Occupational Safety and Health Administration | 1910.1025 | Lead |
| Occupational Safety and Health Administration | 1910.151 | Medical Services and First Aid |

## 2.0 *PROJECT ORGANIZATION AND RESPONSIBILITIES*

The following organization and responsibilities have been established for the site activities.

*Project Manager:* The Project Manager is responsible for delegating responsibilities and supervising all aspects of the project. The Project Manager for the Woolfolk Chemical Works site activities will be Jack Riggenbach. The Project Manager will work directly with the Field Operations Manager to see that all tasks are completed safely. The Project Manager will serve as the Sample Custodian during sampling activities conducted at the site or will designate an individual for this responsibility in his absence.

*Field Operations Manager:* The Field Operations Manager will serve in a supervisory capacity relating to the implementation of field activities, including observing all subcontractor work and all day-to-day field-related activities. An ERM employee will be assigned to serve as the Field Operations Manager at the Woolfolk site. The Field Operations Manager will be responsible for:

- implementing and evaluating the HSP in field operations, and, if necessary, modifying the HSP in response to field conditions;

- maintaining adequate supplies of all personal protective equipment and calibration and maintenance of all monitoring instruments;

- ensuring that all subcontractors, outside observers, and other authorized visitors to the site follow all health and safety precautions; and

- suspending work at the site in the event of nonconformance to, or problems with, the HSP.

The Field Operations Manager for the Woolfolk Chemical Works site will be designated prior to the initiation of field activities.

*Site Safety Supervisor:* The Site Safety Supervisor will be designated by the Project Manager and will meet the following requirements:

- possess a working knowledge of state and federal occupational safety and health regulations;
- have completed formal training and work experience in safety-related work at hazardous waste sites;
- have the authority to suspend work at the site in the event of nonconformance to, or problems with, the HSP; and
- be responsible for overseeing the implementation of the site Health and Safety Plan.

The Site Safety Supervisor for this project will also be responsible for ensuring that all personnel are familiar with and understand the stipulations of the HSP. The Site Safety Supervisor will also ensure that site personnel have an understanding of the inherent risks of chemical exposure associated with a project of this nature and that site personnel have received appropriate training in the use of advanced safety equipment and protective clothing designed to protect against chemical exposure. The Site Safety Supervisor will be designated by the ERM Project Manager prior to the initiation of field activities at the Woolfolk Chemical Works site.

## 3.0 *MEDICAL MONITORING & PERSONNEL TRAINING REQUIREMENTS*

A Medical Monitoring Program has been established for this project in order to monitor and reduce health risks for field personnel who may be at risk or have the potential for exposure to hazardous materials at the site. Table 3-1 outlines the tests covered by this medical monitoring program. This program is based on Occupational Safety and Health Administration (OSHA) equirements as detailed in the Code of Federal Regulations (CFR), pecifically, 29 CFR 1910.120, as well as 29 CFR 1910.1018 and 29 CFR 1910.1025, OSHA standards pertaining to arsenic and lead, respectively. The edical Monitoring Program has been designed to provide baseline medical data for individuals taking part in site activities including field operations as well as to determine the capacity of field personnel to perform necessary field activities while wearing personal protective equipment (PPE) and respirators, f such equipment is determined to be necessary during specific activities. The Medical Monitoring Program is based on the assumption that all field ersonnel will have completed necessary baseline and annual medical xaminations as well as all additional medical screening that may be indicated by prior symptoms of exposures or activities that may have resulted in exposures. These examinations will have been provided by the employer ithout cost or loss of pay to the employee.

Employees who wear or may wear respiratory protection must be provided respirators, as regulated by 29 CFR 1910.134 and 29 CFR 1910.1025. The Medical Monitoring Program must determine the individual's ability to wear respiratory protection while performing designated duties. Although some features of medical monitoring under 29 CFR 1910.120 overlap with stipulations of Respiratory Protection as described in 29 CFR 1910.134 and 29 CFR 1910.1025, the most stringent of specific applicable OSHA requirements governing respiratory protection will be met. An appropriate Respiratory

## TABLE 3-1
## MEDICAL MONITORING EXAMINATIONS

| Description | Frequency | |
|---|---|---|
| Medical History Review & Physical Exam | Baseline | Annual |
| Pulmonary Function Test | Baseline | Annual |
| Audiogram | Baseline | Annual |
| Visual Acuity | Baseline | Annual |
| Routine Laboratory Tests<br>SMAC 25<br>Coronary Risk Profile<br>Urinalysis<br>CBC | Baseline | Annual |
| Chest X-Ray | Baseline | Annual |
| Treadmill Exercise Test | Baseline, as indicated by risk factors | Follow-up as indicated by risk factors |
| Pulmonary Diffusion Test | Baseline, as indicated by risk factors | Follow-up as indicated by risk factors |
| Referral Laboratory Tests<br>Heavy Metals<br>RBC and Serum Cholinesterase | Baseline, as indicated by exposure history | As indicated by exposure potential |

Protection Program that complies with the applicable OSHA standards will be implemented, as necessary.

## 3.1 *PERSONNEL TRAINING*

At a minimum, all personnel conducting field activities at the Woolfolk Chemical Works site will meet training requirements specified by applicable OSHA standards. In addition to general requirements under these standards, field personnel must have a working knowledge of:

- the responsibilities and lines of authority for members of the field team at the site;
- the site-specific hazards related to site conditions and site operations;
- the proper use of personal protective equipment, including respirators, that may be used during field activities;
- appropriate work practices and engineering controls that may be used to reduce the risk of exposure to site hazards;
- the use of monitoring instruments and other safety equipment that may be used at the site;
- the requirements for medical surveillance of hazardous waste site workers;
- site methods used to reduce exposure to on-site and off-site personnel;
- proper decontamination operations and procedures for use with equipment and materials at the site;

- appropriate emergency response operations and procedures; and

- standards concerning excavations, and other special hazards that may pertain to the site and anticipated field activities (e.g., buddy system, etc.)

Members of the field team participating in activities at the site must provide documentation of completion of required training prior to participating in activities at the site. This training is expected to include, at a minimum, 40 hours of hazardous waste site operations training in combination with three days of field experience under the direct supervision of an appropriately trained, experienced supervisor. In addition, field personnel will have completed appropriate training required under the OSHA Lead and Arsenic Standards, respectively. Workers will also have completed the required OSHA 8-hour Update course annually.

## *3.2 AIR MONITORING AT SITE*

Planned field activities and associated site conditions in the vicinity of the work zone are expected to have minimal potential for creating hazardous conditions. Intrusive site activities are limited to drilling conducted in the course of monitoring well installation and do not include demolition or excavation of structures or soils at the site. Based on these planned site activities, hazardous substances are not expected to be released into the work zone or breathing space. Periodic air monitoring will be conducted to confirm the absence of volatile organic compounds (VOCs) using a photoionization detector (PID) unit. Field conditions will also be periodically observed to verify the absence of airborne particulates or dusts producing conditions in the work zone.

Planned site activities will be conducted in Level D gear. Of the VOCs listed in Table 1-1 which have been detected in site soils in some areas, chloroform has the lowest permissible exposure limit (PEL). The PEL for chloroform is 2 parts per million (ppm) or 78 milligrams per cubic meter ($mg/m^3$). The highest level of chloroform which has been detected in surface and subsurface soils at the site is 0.17 mg/kilogram (kg). Based on an assessment of site findings, levels of chemicals detected in area soils are not expected to result in airborne VOCs in work zones. Frequent monitoring of site conditions will ensure that personal protective measures will be upgraded in the event that site conditions change to warrant such measures.

## *3.3 EXPLOSIVITY*

The contaminants of concern at the Woolfolk Chemical Works site are not believed likely to result in an increased flammability or explosivity hazard at the site during field operations. If site conditions should change such that an increased flammability or explosivity hazard is believed to exist at the site, this HSP will be modified and appropriate monitoring will be conducted.

## *4.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)*

### *4.1 PROTECTIVE EQUIPMENT*

Work being conducted as a part of the Remedial Design Work Plan will be conducted in Level D gear as described in this section. In addition, Level C personal protective equipment will kept available during site activities in the event that changed site conditions warrant upgrading personnel attire to a more protective level. All personnel will be properly trained in the use of safety equipment before the start of field activities, in accordance with OSSA requirements. Safety equipment and protective clothing will be used as directed by the Site Safety Officer or Field Operations Manager. All such equipment and clothing will be cleaned and will be maintained in proper condition by project personnel.

Appropriate field attire, including protective coveralls (polyurethane-coated Tyveks®), gloves, footwear and hard hats, will be worn at all times during field activities for this project. Specific levels of protective clothing and equipment are determined based on site activities, with Level D protection being the minimum requirement for all planned field activities inside the work zone. Specific requirements for the levels of protection which may be used during the field activities at the Woolfolk Chemical Works site are detailed on the following pages. Planned field activities and information known regarding the site conditions are not believed likely to result in continuing field work under conditions which would require Level C protection. If site conditions change or site activities are expanded necessitating the use of Level C PE, the site HSP will be reevaluated and modified as necessary. Site activities and site conditions are not expected to require the implementation of Level B or Level A protective gear. Site work will be discontinued in the event that such an upgrade becomes necessary in order to assess the appropriate health and safety

precautions to be implemented prior to proceeding with additional field activities.

The listed personal protective equipment required for Levels D and C protection is in conformance with EPA criteria for PE determinations. Appendix B provides additional information regarding general considerations on which to base the selection of personal protective equipment given the potential contaminants on site. Decontamination procedures are outlined in Appendix C.

**Level D Protection**

1. Tyvek® coveralls or long-sleeved shirts and long pants;

2. Disposable latex gloves, at a minimum, when collecting samples, where practical;

3. Leather or rubber boots;

4. Safety glasses;

5. Level C protection readily available; and

6. Options, as required:
   a. Rubber boots or disposable outer boots,
   b. Hard hat, and
   c. Hearing protection.

**Level C Protection**

1. Full-face respirator with organic vapor/HEPA cartridges;

2. Chemical-resistant clothing, such as polyurethane-coated Tyvek® suits, hooded and one piece with elasticized wrist and ankle bands;

3. Disposable latex surgical gloves, PVC gloves;

4. Safety glasses;

5. Leather boots with disposable outer booties or chemically resistant rubber boots; and

6. Options, as required:
   a. Coveralls,
   b. Disposable outer boots,
   c. Hard hat,
   d. Face shield,
   e. Hearing protection, and
   f. Water-resistant tape.

## 5.0 *DECONTAMINATION*

Personnel involved with field activities may be exposed to chemicals in a number of ways, despite the most stringent protective procedures. Personnel may come in contact with dusts, particulates, vapors, gases, or mists in the air, and will likely come in contact with site media while performing duties. Operation of monitoring instruments and field equipment may also result in exposure to hazardous substances.

Decontamination will generally entail an Alconox® and water solution scrub, followed by clean water rinses. All disposable items will be disposed of in a dry container. Certain parts of contaminated respirators, such as harness assemblies and leather or cloth components, are difficult to decontaminate. If grossly contaminated, they may have to be discarded. Rubber components can be soaked in soap and water and scrubbed with a brush. In addition to being decontaminated, all respirators, non-disposable protective clothing, and other personal articles must be sanitized before they can be used again if they become soiled from exhalation, body oils, and perspiration. The equipment manufacturer's instructions should be followed in sanitizing the respirators. The Site Safety Officer/Field Operations Manager will be responsible for supervising the proper maintenance, decontamination, and sanitization of all respirator equipment.

The layout of a decontamination zone and decontamination procedures must be consistent with needed levels of personal protection, location of field activities, and limitations presented by site topography and site features. Typically, the decontamination zone must be maintained for the duration of planned field activities at the site. The Site Safety Officer/Field Operations Manager will establish and control the decontamination zone as well as designated exclusion areas. Based on particular site activity locations or other limitations at the site, the Site Safety Officer/Field Operations Manager may relocate the

Decontamination Zone. The standard decontamination zone layout will be divided into three subzones, as follows:

Exclusion zone (EZ)--This zone is the site of activity and has the greatest likelihood of contamination potential. Appropriate personal protective equipment must be worn while in this zone. This zone is normally separated from the contaminant reduction zone by a "hotline," or barrier, to prevent personnel from entering the exclusion zone without protective equipment. At a minimum, this zone will radiate to a distance of 20 feet from the point of operations.

Contaminant reduction zone (CRZ)--It is within this zone that the decontamination process is undertaken. Personnel and their equipment must be adequately decontaminated before leaving this zone for the support zone. Appropriate personal protective equipment must be worn while in this zone.

Support zone (SZ)--The support zone is considered to be uncontaminated and, as such, protective clothing and equipment are not required but should be available for use in emergencies. All equipment and materials are stored and maintained within this zone. Protective clothing is donned in the support zone before entering the contaminant reduction zone.

Standard personnel and PPE decontamination procedures are further described in Appendix B. All vehicles and equipment will be decontaminated using a powered steam system (steam jenny). All decontamination water will be disposed of accordance with approved procedures.

## 6.0 *SITE ACCESS AND SITE CONTROL*

Access inside the specific work locations at the site will be limited to trained authorized personnel. These personnel include members of the field operations team, designated equipment operators, and designated client and state and federal agency representatives. However, access into the established exclusion zone or work area will be limited to those authorized personnel wearing appropriate personal protective equipment.

Security procedures must be followed to ensure suitable site control and the limitation of access so that those persons who may be unaware of site conditions are not exposed to inherent hazards. Since the Woolfolk Chemical Works site is expected to be in operation during the conduct of field activities at the site, it will be essential that site access restrictions be communicated to any facility personnel.

Any excavations left open and unattended by site personnel that are outside of fenced areas will be appropriately barricaded and visibly posted with "Keep Out--Danger" signs, warning flags, or other appropriate signs. The Site Safety Supervisor/Field Operations Manager will make the decision to post a security guard during nonworking hours, if warranted. All heavy machinery and equipment will be stored in a secured area upon completion of daily activities. Lastly, all potentially contaminated media, such as soil, will be secured in an area to prevent unauthorized tampering.

## 7.0 *EMERGENCY RESPONSE*

A list of all emergency response telephone numbers is provided in Table 7-1 and will be posted on site during all field activities. Public safety personnel, such as the Fire and Police Departments, will be notified if there is a potential or actual need to evacuate the nearby public.

The Site Safety Supervisor/Field Operations Manager will be responsible for responding to all emergencies and will:

1. Ensure that first-aid supplies and a fire extinguisher are available at the site;

2. Be familiar with information provided on the Material Safety Data Sheets (MSDSs) for site contaminants and be able to communicate that information to emergency response personnel in the event of an emergency (see Appendix E);

3. Have working knowledge of all safety equipment available at the site; and

4. Ensure that a map, which details the most direct route to the nearest hospital, is prominently posted with the emergency telephone numbers.

## 7.1 *ACCIDENTS AND INJURIES*

In the event of a safety or health emergency at the site, appropriate emergency measures will immediately be taken to assist those who have been injured or exposed and to protect others from hazards. The Site Safety Supervisor will be immediately notified and will respond according to the seriousness of the injury. Based on the nature of the emergency, appropriate emergency

Table 7-1

EMERGENCY RESPONSE

| Emergency Service | Location | Telephone |
|---|---|---|
| **EPA - Region IV** | 345 Courtland St.<br>Atlanta, GA 30309 | (404) 347-4062 |
| **Police:**<br>Fort Valley Police Department | 204 W. Church Street<br>Fort Valley, GA 31030 | 911 or 825-3382 |
| **Fire:**<br>Fort Valley Fire Department | 204 W. Church Street<br>Fort Valley, GA 31030 | 911 or 825-2211 |
| **Ambulance:**<br>Peach County Ambulance | 601 N. Camellia Blvd.<br>Fort Valley, GA 31030 | 911 or 825 2616 |
| **Water Department:**<br>Fort Valley Utility Commission | 400 Anthoine<br>Fort Valley, GA 31030 | 825-7701 |
| **Gas Utility:**<br>Fort Valley Utility Commission | 400 Anthoine<br>Fort Valley, GA 31030 | 825-7701 |
| **Electric:**<br>Fort Valley Utility Commission | 400 Anthoine<br>Fort Valley, GA 31030 | 825-7701 |
| **Hospital:**<br>Peach County Hospital | North Camellia Blvd.<br>Fort Valley, GA 31030 | 825-8691 |
| **National Poison Control:** | CDC Atlanta, GA | (800) 942-5969 |
| **National Response Center:** | Washington, D.C. | (800) 424-8802 |

Route to Hospital: Peach County Hospital is located north-northeast of the Woolfolk site and can be reached within approximately ten minutes. Directions to the hospital are as follows: make a right turn onto Preston Street and proceed to Railroad Street; make a right turn on Railroad Street and proceed northeast toward the intersection of Railroad Street and Martin Luther King; continue on Railroad Street through the intersection and cross railroad tracks at the junction of Railroad Street and state road 96; proceed straight on Railroad street to traffic light at a five-way intersection and turn right at the traffic light onto Macon Street (SR 49). Peach County Hospital is located approximately one mile north-northeast on left at corner of Macon Street and North Camellia Boulevard. The hospital's emergency entrance is located on North Camellia Boulevard (See Figure 7-1).

## OTHER PERSONS TO BE CONTACTED IN AN EMERGENCY

| | |
|---|---|
| Jack Riggenbach<br>ERM Project Manager | (404) 590-8383<br>(404) 509-8055 |
| Doug Wagner<br>ERM Field Operations Manager | (404) 590-8383 |
| Diane Drew<br>ERM Southeast H&S Coordinator | (404) 590-8383<br>(404) 578-9406 |
| Tim Woolheater, Remedial Project Manager (EPA, Region IV) | (404) 347-2643 |
| Arthur Collins, Alternate Project Coordinator (EPA, Region IV) | (404) 347-2643 |
| EPA Region IV Emergency Spill Response | (404) 347-4062 |
| Richard Sobel<br>Clean Sites Project Coordinator | (703) 739-1221 |

response personnel (e.g., fire department, ambulance, etc.) will be summoned without delay. The Project Manager will be notified immediately concerning any serious injuries to field personnel, subcontractors, or agency representatives. Notification of the Project Manager will include, but not be limited to, any injuries or illnesses that require medical attention.

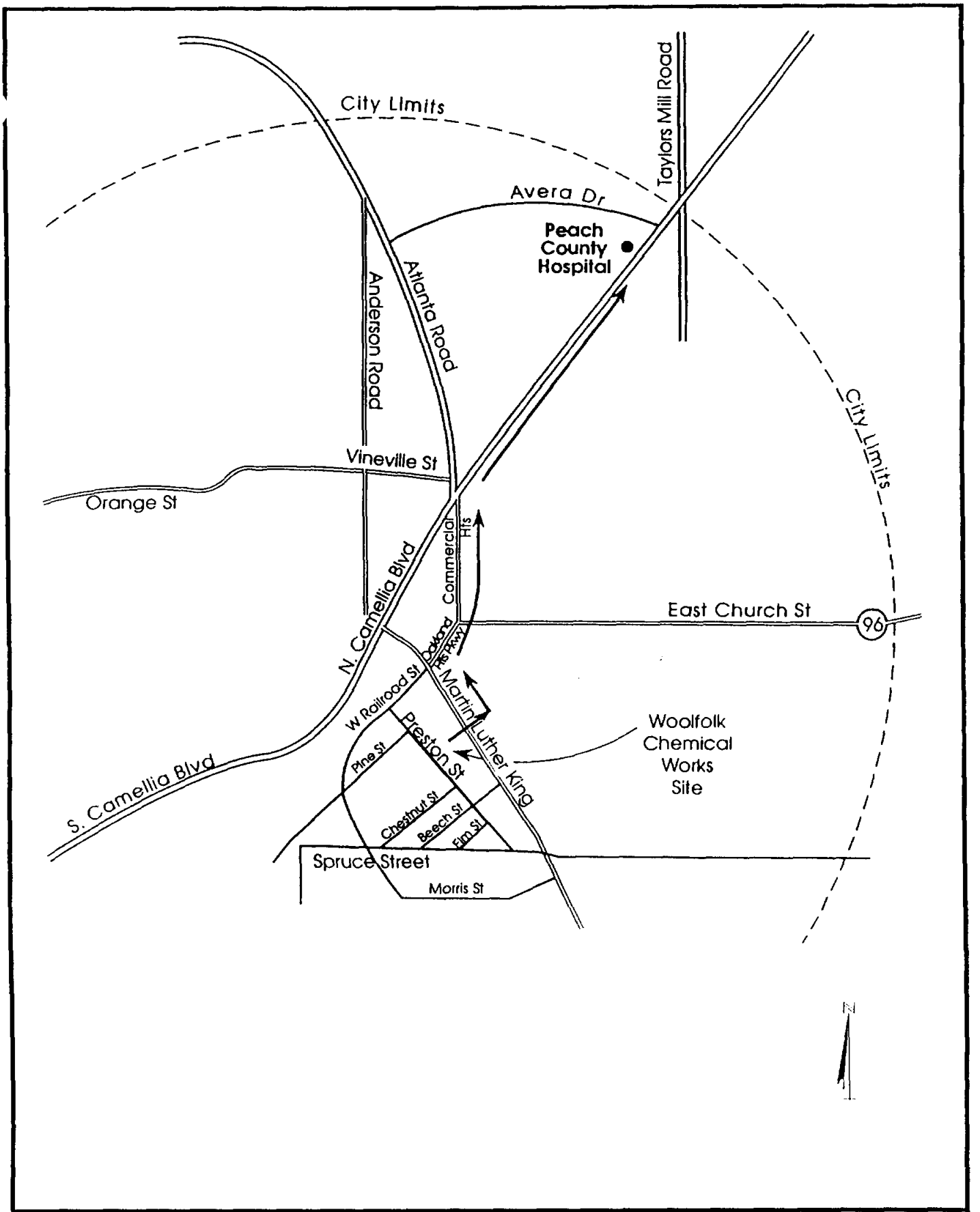
In the event of an injury or illness that necessitates medical attention or an event that results in damage to field equipment or vehicles, an Incident Report will be completed which describes the injury or damage. Copies of the completed Incident Report will be provided to the Project Manager, the Field Operations Manager, and the Site Safety Supervisor.

## *7.2 COMMUNICATIONS*

Telephone locations at the site will be identified at the outset of field activities in order to ensure prompt access in the event of an emergency. If it is determined that use of facility telephones may be impractical under emergency conditions, a mobile telephone will be present during site activities for emergency response and office communications.

## *7.3 DIRECTIONS TO NEAREST HOSPITAL*

Peach County Hospital is located north-northeast of the Woolfolk site and can be reached within approximately ten minutes. Directions to the hospital are as follows: make a right turn onto Preston Street and proceed to Railroad Street; make a right turn on Railroad Street and proceed northeast toward the intersection of Railroad Street and Martin Luther King; continue on Railroad Street through the intersection and cross railroad tracks at the junction of Railroad Street and state road 96; proceed straight on Railroad street to traffic light at a five-way intersection and turn right at the traffic light onto Macon Street (SR 49). Peach County Hospital is located approximately one mile




| | | |
|---|---|---|
| Woolfolk Chemical Works<br>NPL Site<br>Fort Valley, Georgia | Figure 7-1<br><br>Route to Hospital | DWG No. 3065-006-1<br>12/14/93:MCB:JDR<br>ERM EnviroClean-Southeast, Inc.<br>Kennesaw, Georgia |

north-northeast on left at corner of Macon Street and North Camellia Boulevard. The hospital's emergency entrance is located on North Camellia Boulevard (See Figure 7-1).

## 8.0 *SPECIAL PRECAUTIONS AND PROCEDURES*

A number of potential health and safety risks will be present during field activities at the Woolfolk Chemical Works site secondary to both chemical and physical hazards. The potential for chemical exposure to hazardous substances is significantly reduced through the proper use of appropriate personal protective clothing, engineering controls, and safe work practices. Other potential hazards that may be associated with site activities include heavy equipment, vehicular traffic, heat or cold exposure, rapid or unexpected soil movement during excavation at the site.

Precautionary measures have been established to reduce these risks to a minimum during site activities. Tables 1-1 and 1-2, previously cited, summarize hazards that may be associated with the site.

## 8.1 *HEAVY MACHINERY/EQUIPMENT*

All personnel must remain aware of those site activities that involve the use of heavy equipment and machinery. If, at the direction of the Site Safety Supervisor or the Field Operations Manager, it becomes necessary to don respiratory protection, ear plugs, or other protective gear, such equipment significantly reduces peripheral vision and verbal communication of the wearer further increasing the caution that should be observed in proximity to heavy equipment and machinery. In any case, it is essential that all employees at the site exercise extreme caution during the operation of such equipment and machinery to avoid physical injury to themselves or others. Foot traffic near heavy equipment (even when equipment is not believed to be operational) will proceed with extreme caution. Direct eye contact with the equipment operator should be established and maintained by personnel that must move around or work in the vicinity of such equipment.

## 8.2 *SITE EVACUATION*

As previously discussed, conditions at the site will be monitored for possible changes in dust levels (e.g., airborne particulates) and other conditions that may indicate potentially increased or altered site hazards. In the event of significant changes to site conditions, a decision may be made to evacuate personnel from the site. In the event of evacuation of the work zone, all personnel will remain near the site in a designated reconnaissance area at an upwind location. In order to ensure that all personnel will be accounted for in the event of an emergency, all personnel are expected to remain in the designated reconnaissance location until instructed to return to work or released by the Field Operations Manager to leave the area.

A further evaluation of site conditions will be made by the Site Safety Supervisor or Field Operations Manager to determine whether personnel may safely return to the work zone and continue with site activities. It will be the Field Operations Manager's responsibility to release personnel to leave the site if it is determined that field activities will not resume for the time being.

In addition, site conditions, including wind direction and velocity, will be evaluated to determine if possible airborne contaminant levels or other changed site hazards may potentially impact nearby receptors including neighborhood residents and students and staff at the nearby school. Local emergency response personnel will be notified if such conditions are thought to exist, in order to facilitate appropriate notification and follow-up.

## 8.3 *GENERAL SAFETY PRACTICES*

The following safety precautions will be observed by all personnel taking part in activities at the Woolfolk Chemical Works site. Visitors authorized to enter

the restricted areas at the site will also be expected to comply with these guidelines.

1. Eating, drinking, chewing gum or tobacco, smoking, or any practice that may increase the likelihood of ingestion of dusts, particulates, mists, or other potentially contaminated materials is prohibited in any restricted area at the site.

2. Hands and face must be thoroughly washed upon leaving the work area prior to eating, drinking, smoking, or other activities that may result in hand-mouth-clothing contact.

3. Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after removal of protective clothing.

4. In the event that it becomes necessary to don respiratory protection, no facial hair which interferes with an effective face-to-respirator seal will be permitted on personnel required to wear respiratory protection equipment. Positive and negative pressure testing of the respirator's facepiece seal will be performed by the wearer prior to respirator use to ensure the proper seal of the respirator. Air-purifying cartridges used with each respirator will be replaced at the end of each work shift, at a minimum, more frequently as indicated by site conditions, and immediately in the event of indications of chemical breakthrough. Respirators will be issued for the exclusive use of one worker and will be cleaned and sanitized after each use by the worker. Between uses, respirators will be properly stored to prevent damage or effectiveness reduction. Respirators will be inspected daily by the Site Safety Officer/Site Supervisor.

5. Contact with potentially contaminated surfaces should be avoided or minimized to the greatest extent possible. One should not walk through puddles, mud, or other discolored media; kneel on the ground; or lean, sit, or place equipment on drums, containers, vehicles, or the ground.

6. Certain chronic health conditions (e.g., liver or kidney damage, etc.) may potentiate the effects of exposure to certain compounds; if such conditions are known to be present, worker's assignment to site may necessitate reevaluation.

7. Prescribed drugs or over-the-counter medicines being taken by field personnel should be discussed with the Site Safety Supervisor/Field Operations Manager prior to participating in field activities and, if necessary, discussed with the worker's personal physician to determine any increased health risk potential that may exist.

8. Personnel and equipment in the work areas should be minimized, consistent with effective site operations and work areas for specific field activities (e.g., decontamination area, waste accumulation area, etc.) should be established.

9. Routine procedures for entering and leaving restricted areas must be planned and implemented during site activities; personnel will be expected to check in and check out with the Field Operations Manager or with the senior field personnel on site. Work areas and decontamination procedures will be established on the basis of prevailing site conditions.

10. Appropriate personal protective equipment including safety gloves, coveralls, and boots will be properly worn and maintained. Damaged

protective gear will be properly discarded and replaced with undamaged attire.

11. All unsafe equipment left unattended will be identified by a "DANGER, DO NOT OPERATE" tag; when possible, such equipment will be temporarily decommissioned to prevent the inadvertent start-up of such equipment.

12. If determined by the Site Safety Supervisor to be indicated, noise mufflers or ear plugs may be required for all site personnel working around heavy equipment.

13. In the event that it becomes necessary to don Level C gear, all activities in the work zone will be conducted using a 'buddy system' with another worker fully dressed in the appropriate PPE having the following assigned responsibilities:

    - immediate assistance to his/her partner;
    - continual observation of his/her partner for signs of chemical exposure;
    - periodically check the integrity of his/her partner's PPE; and
    - notify others if emergency help is needed.

## 9.0 *SITE DOCUMENTATION*

The Site Safety Supervisor or Field Operations Manager will be responsible for keeping daily logs (Figure 9-1). The daily Log will include the following information:

- date;
- general weather conditions (temperature, wind direction, precipitation);
- personnel on site;
- site activities and heavy equipment being used;
- levels of personal protection in use;
- safety deficiencies or incidents observed or reported to have occurred at site;
- visitors, if any, to the site;
- monitoring instruments used, including:
  - monitoring instrument(s) (name, model, serial number) being used;
  - instrument readings;
  - time and date of reading;
  - location where reading was taken;
  - date of most recent calibration;
- Site Safety Supervisor or Field Operations Manager signature.

If an accident occurs an Incident Report will be completed with copies provided to the Project Manager, Field Operations Manager, and the Site Safety Supervisor (Figure 9-2). An Incident Report should also be completed in the event of a work-related illness which requires medical attention or significant damage to equipment.

Figure 9-1
**ERM-ENVIROCLEAN-SE**
**DAILY FIELD ACTIVITY FORM**

DATE_____ SITE MGR._____ LOCATION_____
PROJECT_____ PROJECT NO._____
ACTIVITIES CONDUCTED_____
_____
_____
_____
_____

WEATHER CONDITIONS_____ HOURS LOST TO WEATHER_____
PERSONNEL PROTECTION LEVEL USED __ A __ B __ C __ D

ERM PERSONNEL ON SITE:
_____ HOURS WORKED_____
_____ HOURS WORKED_____
_____ HOURS WORKED_____
_____ HOURS WORKED_____

SUBCONTRACTOR PERSONNEL ON SITE:
_____ HOURS WORKED_____
_____ HOURS WORKED_____
_____ HOURS WORKED_____
_____ HOURS WORKED_____

MAJOR EQUIPMENT USED ON SITE:
_____ HOURS_____
_____ HOURS_____
_____ HOURS_____
_____ HOURS_____

MATERIALS DELIVERED TO SITE:
_____
_____
_____

WASTES REMOVED FROM SITE:

NO. DRUMS_____ MANIFEST NOS._____
NO. ROLLOFFS_____ MANIFEST NOS._____
NO. DUMPS_____ MANIFEST NOS._____
ACCIDENTS __ Y __ N REPORTED __ Y __ N REPORT ATTACHED __ Y __ N
COMMENTARY_____
_____
_____
_____

Figure 9-2

**ERM EnviroClean-Southeast, Inc.**
**Incident Report**

---

NAME: _____

TIME/DATE OF INCIDENT: _____

LOCATION OF INCIDENT: _____

BRIEF DESCRIPTION OF INCIDENT: _____

_____

_____

_____

_____

_____

TREATMENT SOUGHT (IF ANY): _____

_____

_____

RELATED SYMPTOMS OR PROBLEMS: _____

_____

_____

FOLLOW-UP NEEDED (IF ANY): _____

_____

_____

_____

_____

---

CC TO: BRENTWOOD: _____

J. D. RIGGENBACH : _____

FILE COPY: _____

INCIDENT REPORT FORM

## *10.0 PROCEDURES FOR PROTECTING THIRD PARTIES*

The Site Safety Supervisor or the Field Operations Manager will be responsible for monitoring the health and safety practices of all personnel and ill supply a copy of the HSP for review by any subcontractors who may take part in field activities prior to their participation in site activities. All personnel entering the work site area must follow the site access and site control procedure previously discussed.

## *10.1 SUBCONTRACTORS AND OTHER PERSONNEL*

Only subcontractors that are properly trained and competent to perform the scheduled tasks will take part in field activities at the Woolfolk Chemical Works site. Subcontractors are required to provide documentation regarding compliance with applicable regulations (Table 10-1).

As discussed in the introduction, ERM has prepared this HSP for use at the Woolfolk Chemical Works site. ERM will provide copies of the HSP to contractors working on the site, however, ERM's preparation of the HSP is not intended to replace Contractors' safety programs or established worker health and safety practices by the Contractors. Each Contractor shall have sole responsibility for implementing its own safety programs and for supervising implementation of such programs.

## *10.2 AREA CONDITIONS*

Air quality and other conditions will be monitored at the perimeter of the work site in order to determine contaminant or airborne particulate levels in the ambient air that may affect off-site populations. Appropriate corrective measures will be taken as indicated by monitoring findings to reduce the risk of health or safety hazard to off-site populations in the vicinity of the Woolfolk

# TABLE 10-1

## SUBCONTRACTOR OCCUPATIONAL SAFETY AND HEALTH CERTIFICATION

PROJECT:_____

SUBCONTRACTOR:_____

1. Contractor certifies that the following personnel to be employed during this project have met the following requirements of the OSHA Hazardous Waste Operations Standard (29 CFR 1910.120) and other applicable OSHA standards, as required by ERM.

| Subcontractor Personnel | Training | Respirator Certification | Medical Exam |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

2. Subcontractor certifies that it has received a copy of the Site Safety and Health Plan to be used as a reference and will ensure that its employees are informed about the hazards at the site.

3. Subcontractor further certifies that it has read and understand and will comply with all provisions of its contractual agreement.

_____
Authorized Signature

9317

Chemical Works site who may be affected by possible exposures. Site control procedures, as previously discussed, will be established to protect persons who may be unaware of potential on-site hazards.

# *APPENDIX A*
## *Personal Protective Equipment*

# APPENDIX A

# PERSONAL PROTECTIVE EQUIPMENT

## INTRODUCTION

Anyone entering a hazardous waste site must be protected against potential hazards. The purpose of personal protective clothing and equipment (PPE) is to shield individuals from the chemical, physical, and biologic hazards that may be encountered at a hazardous waste site. Careful selection and use of adequate PPE should protect the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing.

Tho Occupational Safety and Health Administration (OSHA) requires the use of PPE in 29 CFR Part 1910 (see Table A-1), as does the U.S. Environmental Protection Agency (EPA) in 40 CFR Pat 300, which includes requirements for all private contractors working on hazardous waste sites to conform to applicable OSHA provisions and any other federal or state safety requirements deemed necessary by the lead agency overseeing the activities.

No single combination of PPE can protect against all hazards; therefore, it should be used in conjunction with other protective methods. PPE can itself create significant hazards such as heat stress, physical and psychological stress, and impaired vision, mobility, and communication. In general, the greater the level of PPE used, the greater the associated risks. For any given situation, equipment and clothing should be selected to provide maximum protection using minimum equipment.

### Selection of Protective Clothing and Accessories

Maximum personal protection includes respiratory protection, protective clothing and appropriate accessories. Personal protective clothing is considered to be any article offering skin and/or body protection.

**Typical Personal Protective Clothing**

- Fully-encapsulating suits
- Non-encapsulating suits
- Aprons, leggings, and sleeve protectors
- Gloves
- Firefighter's protective clothing
- Proximity, or approach, garments
- Blast and fragmentation suits
- Cooling garments
- Radiation-protective suits

Each type of protective clothing has a specific purpose; many, but not all, are designed to protect against chemical exposure.

Accessories that might be used in conjunction with a PPE ensemble include the following:

- Knife
- Flashlight or lantern
- Personal locator beacon
- Personal dosimeters
- Two-way radio
- Safety belts and lines

**Selection of Chemical-Protective Clothing (CPC)**

Chemical-protective clothing (CPC) is available in a variety of materials offering a range of protection against different chemicals. The most appropriate clothing material depends on the chemicals present and the task to be accomplished.

**Factors to Consider When Choosing CPC**

**Permeation** is the process by which a chemical dissolves in and/or moves through a protective clothing material on a molecular level. Figures A-1 and A-2 provide resistance information for suits and gloves.

**Degradation** is the loss of or change in the fabric's chemical resistance or physical properties due to exposure to chemicals, use, or ambient conditions (e.g., sunlight).

**Penetration** is the movement of chemicals through zippers, stitched seams or imperfections (e.g., pinholes) in a protective clothing material.

**Heat Transfer Characteristics** is a measure of the capacity of the CPC to dissipate heat through means other than evaporation, know as the "clo" value (thermal insulation value). The larger the clo value, the greater the insulating properties of the garment and, consequently, the lower the heat transfer. Given other equivalent protective properties, clothing with the lowest clo value should be selected for hot environments or high work rates. Unfortunately, clo values for clothing are rarely available at present.

Selection of CPC is a complex task and should be performed by personnel who have training and experience. Under all conditions, clothing is selected by evaluating the performance characteristics of the clothing against the requirements and limitations of the sites and task-specific conditions. If possible, representative garments should be inspected before purchase, and their use and performance discussed with someone who has experience with the clothing under consideration. In all cases, the employer is responsible for ensuring that the personal protective clothing (and all PE) necessary to protect employees from injury or illness that may result from exposure to hazards at the work site is adequate and of safe design and construction for the work to be performed (see OSHA standard 29 CFR Part 1910.132-1910.137).

**Other Considerations**

In addition to permeation, degradation, penetration, and heat transfer, several other factors must be considered during clothing selection. These affect not only chemical resistance, but also the worker's ability to perform the required task. The following checklist summarizes these considerations.

**Durability:**

Does the material have sufficient strength to withstand the physical stress of the task(s) at hand? Will the material resist tears, punctures, and abrasions? Will the material withstand repeated use after contamination/decontamination?

**Flexibility:**

Will the CPC interfere with the workers' ability to perform their assigned tasks? (Flexibility is particularly important to consider when choosing gloves. Figure A-3 provides some guidelines for gloves).

**Temperature effects:**

Will the material maintain its protective integrity and flexibility under hot and cold extremes?

**Ease of decontamination:**

Are decontamination procedures available onsite? Will the material pose any decontamination problems? Should disposable clothing be used?

**Compatibility with other equipment:**

Does the clothing preclude the use of other necessary pieces of protective equipment (e.g., suits that preclude hardhat use in hardhat areas)?

**Duration of use:**

Can the required task be accomplished before contaminant breakthrough occurs or degradation of the CPC becomes significant?

**Selections of Ensembles-Levels of Protection**

The individual components of clothing and equipment must be assembled into a full protective ensemble that both protects the worker from the site-specific hazards and minimized the hazards and drawbacks of the PPE ensemble itself.

Ensembles based on the widely-used EPA Levels of Protection are categorized as level A, B, C, or D. These are fully described in Section 5.0 of the Health and Safety Plan. The specific ensemble components can be used as a starting point for ensemble creation: however, each ensemble must be tailored to the specific situation in order to provide the most appropriate level of protection. For example, if work is being conducted at a highly contaminated site or if the potential for contamination is high, it may be advisable to wear a disposable covering, such as Tyvek coveralls or PVC slash suits, over the protective ensemble. It may be necessary to slit the back of these disposable suits to fit around the bulge of an encapsulating suit and SCBA.

The type of equipment used and the overall level of protection should be reevaluated periodically as the amount of information about the site increases, and as workers are required to perform different tasks. Personnel should be able to upgrade or downgrade their level of protection with the approval of the Site Safety Officer and the Field Team Leader.

**Reasons to upgrade**

- Known or suspected presence of dermal hazards.
- Occurrence or likely occurrence of gas or vapor emissions.

- Change in work task that will increase contact or potential contact with hazardous materials.

- Request by the individual performing the task.

**Reasons to downgrade:**

- New information indicating that the situation is less hazardous than was originally thought.

- Change in work task that will reduce contact with hazardous materials.

**PPE Use**

PPE can offer a high degree of protection only if it is used properly. The following are factors that contribute to safe and proper use of PPE. Inadequate attention to any of these areas could compromise the protection provided by the PPE.

Tables A-2 and A-3 provide sample donning and doffing procedures respectively. Table A-4 provides a sample PPE inspection checklist. The use of proper inspection, donning, and doffing procedures helps to provide a higher degree of protection from the PPE worn.

Respirators are a special group of PPE. The use of respirators requires a written respiratory protection program, medical evaluation, training, and fit testing. The minimal program requirements are listed in Table A-5.

**Selection of Respiratory Equipment**

Respiratory protection is of primary importance on a hazardous waste site because inhalation is one of the major routes of exposure to chemical toxicants. Respiratory protective devices (respirators) consist of a facepiece connected to either

- an air source or
- an air purifying device.

Respirators with an air source are called **atmosphere-supplying respirators**; there are two types:

- Self-contained breathing apparatus (SCBAs), which supply air from a source carried by the user; and

- Supplied-air respirators (SARs), which supply air from a source located some distance away, connected to the user by an air-line hose. Supplied-air respirators are also called air-line respirators.

**Air-purifying respirators**, unlike atmosphere-supplying respirators, do not have a separate air source. Instead, they purify ambient air using a filter. Table A-6 provides conditions that may exclude use of Air-purifying respirators.

**Air-Purifying Respirators**

Air-purifying respirators usually operate only in the negative-pressure mode, except for powered air-purifying respirators (PAPRs), which maintain a positive facepiece pressure except at maximal breathing rates. There are three types of air-purifying devices: (1) particulate filters; (2) cartridges and canisters, which contain sorbents for specific gases and vapors; and (3) combination devices. Their efficiencies vary considerably even for closely related materials.

Cartridges usually attach directly to the respirator facepiece. Large-volume canisters attach to the chin of the facepiece or are carried with a harness and attached to the facepiece by a breathing tube. Combination canisters and cartridges contain layers of different sorbent materials and remove multiple chemicals or multiple classes of chemicals from the ambient air. Though approved for protection from more than one substance, these canisters and cartridges are tested independently against single substances. Thus, the effectiveness of these canisters against two or more substances has not been demonstrated. Filters may also be combined with cartridges to provide additional protection against particulates. A number of standard cartridges and canisters are commercially available They are color-coded to indicate the general chemicals or classes of chemicals against which they are effective (29 CFR Part 1910.134[g]). Standard marking and coloration of canister and cartridges used for respirator protection are instituted by ANSI K 13.1-1973. (See Table A-7).

MSHA and NIOSH have granted approvals for manufacturers' specific assemblies of air-purifying respirators for a limited number of specific chemicals. Respirators should be used only for those substances for which they have been approved. Use of sorbent shall not be allowed when there is reason to suspect that it does not provide adequate sorption efficiency against specific contaminant. In addition, it should be noted that approval testing is performed at a given temperature and over a narrow range of flow rates and relative humidities; thus, protection may be compromised in nonstandard conditions. The assembly that has been approved by MSHA and NIOSH to protect against organic vapors is tested against only a single challenge substance, carbon tetrachloride; its effectiveness for protecting against other vapors has not been demonstrated.

Most chemical sorbent canisters are imprinted with an expiration date. They may be used up to the date as long as they have not been opened previously. Once opened, they begin

to absorb humidity and air contaminants whether or not they are in use. Their efficiency and service life decreases, and therefore they should be used immediately. Cartridges should be discarded after use but should not be used for longer than one shift or when breakthrough occurs, whichever comes first.

Where a canister or cartridge is being used against gases or vapors, the appropriate device shall be used only if the chemical(s) have "adequate warning properties" (30 CFR Part 11.150). NIOSH considers a substance to have adequate warning properties when its odor, taste, or irritant effects are detectable and persistent at concentrations below the recommended exposure limit (REL). A substance is considered to have poor warning properties when its odor or irritation threshold is above the applicable exposure limit.

SCBAs, SARs, and air-purifying respirators are further differentiated by the type of air flow supplied to the facepiece:

- **Positive-pressure respirators** maintain a positive pressure in the facepiece during both inhalation and exhalation. The two main types of positive-pressure respirators are pressure-demand and continuous flow.

  In pressure-demand respirators, a pressure regulator and an exhalation valve on the mask maintain the mask's positive pressure except during high breathing rates. If a leak develops in a pressure-demand respirator, the regulator sends a continuous flow of clean air into the facepiece, preventing penetration by contaminated ambient air.

  Continuous-flow respirators (including some SARs and all powered air-purifying respirators) are operated in a positive-pressure continuous-flow mode using filtered ambient air. (However, at maximal breathing rates, a negative pressure may be created in the facepiece).

- **Negative-pressure respirators** draw air into the facepiece during user inhalation. The main disadvantage of negative-pressure respirators is that if any leaks develop in the system, the user draws contaminated air into the facepiece during inhalation.

Of atmosphere-supplying respirators, only those which operate in the positive-pressure mode are recommended for work at hazardous waste sites.

Different types of facepieces are available for use with the various types of respirators. The types generally used at hazardous waste sites are full facepieces and half masks:

- **Full-facepiece masks** cover the face from the hairline to below the chin. They provide eye protection.

- **Half masks** cover the face from below the chin to over the nose and do not provide eye protection.

Federal regulations require the use of respirators that have been tested and approved by the Mine Safety and Health Administration (MSHA) and NIOSH. Testing procedures are described in 30 CFR Part 11. Approval numbers are clearly written on all approved respiratory equipment; *however, not all respiratory equipment that is marketed is approved.* Periodically, NIOSH publishes a list, entitled NIOSH Certified Equipment List, of all approved respirators and respiratory components.

**Protection Factor**

The level of protection that can be provided by a respirator is indicated by the respirator's protection factor. This number, which is determined experimentally by measuring facepiece seal and exhalation valve leakage, indicates the relative difference in concentrations of substances outside and inside the facepiece that can be maintained by the respirator. Table A-8 lists typical respiratory protection factors.

For example, the protection factor for full-facepiece air-purifying respirators is 50. This means, theoretically, that workers wearing these respirators should be protected in atmospheres containing chemicals at concentrations that are up to 50 times higher than the appropriate limits. One source of protection factors for various types of atmosphere-supplying and air-purifying respirators is the American National Standards Institute (ANSI) standard ANSI Z88.2-1980.

At sites where the identity and concentration of chemicals in the air are known, a respirator should be selected with a protection factor that is high enough to ensure that the wearer will not be exposed to the chemicals above the applicable limits. These limits include the American Conference of Governmental Industrial Hygienists; Threshold Limit Values (TLVs), OSHA's Permissible Exposure Limits (PELs), and the NIOSH Recommended Exposure Limits (RELs). These limits are designed to protect most workers who may be exposed to chemicals day after day throughout their working lives. The OSHA PELs are legally enforceable exposure limits and are the minimum limits of protection that must be met.

Protection provided by a respirator can be compromised in several situations:

- If a worker has a high breathing rate;
- If the ambient temperature is high or low; or
- If the worker has a poor facepiece-to-face seal.

At high breathing rates, positive-pressure SCBAs and SARs may lose positive pressure for brief periods during peak inhalation. Also, at high work rates, exhalation valves may leak. Consequently, positive-pressure respirators working at high flow rates may offer less protection than those working at normal rates.

A similar reduction in protection may result from high or low ambient temperatures. For example, at high temperatures excessive sweat may cause a break in the facepiece-to-face seal. At very low temperatures, the exhalation valve and regulator may become ice-clogged because of moisture in the breath and air. Likewise, a poor facepiece seal caused by facial hair, missing teeth, scars, lack of or improper fit testing, etc., can result in contaminant penetration.

TABLE A-1

OSHA STANDARDS FOR USE OF PPE

| Type of Protection | Regulation | Source |
|---|---|---|
| General | 29 CFR Part 1910.132 | 41 CFR Part 50-204.7 General Requirements for Personal Protective Equipment. |
| | 29 CFR part 1910.1000 | 41 CFR part 50-204.50, except for Table Z-2, the source of which is American National Standards Institute, Z37 series. |
| Hazardous Waste Site Operations | 29 CFR part 1910.120 | OSHA Rulemaking. |
| | 29 CFR Part 1910.1001-1045 | OSHA Rulemaking. |
| Eye and Face | 29 CFR Part 1910.133 | ANSIZ87.1-1968 Eye and Face Protection |
| Noise Exposure | 29 CFR Part 1910.95 | 41 CFR Part 50-204.10 and OSHA Rulemaking. |
| Respiratory | 29 CFR part 1910.134 | ANSI Z88.2-1969 Standard practice for Respiratory Protection |
| Head | 29 CFR part 1910.135 | ANSI Z89.1-1969 Safety Requirements for Industrial Head Protection |
| Foot | 29 CFR Part 1910.136 | ANSI Z9.4-1968 Ventilation and Safe Practices of Abrasive Blasting Operations |
| Electrical Protective Devices | 29 CFR Part 1910.137 | ANSI Z9.4-1968 Ventilation and Safe Practices of Abrasive Blasting Operations |

## TABLE A-2

## SAMPLE DONNING PROCEDURES a,b

1. Inspect the clothing and respiratory equipment before donning.

2. Adjust hard hat or headpiece if worn, to fit user's head.

3. Open back closure used to change air tank (if suit has one) before donning suit.

4. Standing or sitting, step into the legs of the suit; ensure proper placement of the feet within the suit; then gather the suit around the waist.

5. Put on chemical-resistant safety boots over the feet of the suit. Tape the cuff over the tops of the boots.

   - If additional chemical-resistant boots are required, put these on now.

   - Some one-piece suits have heavy-soled protective feet. With these suits, wear short, chemical-resistant safety boots inside the suit.

6. Put on air tanks and harness assembly of the SCBA. Don the facepiece and adjust it to be secure, but comfortable. Do not connect the breathing hose. Open valve on air tank.

7. Perform negative and positive respirator facepiece seal test procedures.

   - To conduct a negative-pressure test, close the inlet part with the palm of the had or squeeze the breathing tube so it does not pass air, and gently inhale for about 10 seconds. Any inward rushing of air indicates a poor fit. Note that a leaking facepiece can be drawn tightly to the face to form a good seal, giving a false indication of adequate fit.

   - To conduct a positive-pressure test, gently exhale while covering the exhalation valve to ensure that a positive pressure can be built up. Failure to build a positive pressure indicates a poor fit.

8. Depending on type of suit:

   - Put on long-sleeved inner gloves (similar to surgical gloves).

   - Secure gloves to sleeves, for suits with detachable gloves (if not done prior to entering the suit).

   - Additional over gloves, worn over attached suit gloves, may be donned later.

TABLE A-2 (Continued)

SAMPLE DONNING PROCEDURES a,b

9. Put sleeves of suit over arms as assistant pulls suit up and over the SCBA. Have assistant adjust suit around SCBA over shoulders to ensure unrestricted motion.

10. Put on hard hat, if needed.

11. Raise hood over head carefully so as not to disrupt face seal of SCBA mask. Adjust hood to give satisfactory comfort.

12. Begin to secure the suit, closing all fasteners on opening until there is only adequate room to connect the breathing hose. Secure all belts and/or adjustable leg, head, and waistbands.

13. Connect the breathing hose while opening the main valve.

14. Have assistant first ensure the wearer is breathing properly and then make final closure of the suit.

15. Have assistant observe the wearer for a period of time to ensure that the wearer is comfortable, psychologically stable, and that the equipment is functioning properly.

a. Perform the procedures in the order indicated.

b. When donning a suit, use a moderate amount of powder to prevent chaffing and to increase comfort. Powder will also reduce rubber binding.

## TABLE A-3

## SAMPLE DOFFING PROCEDURES

If sufficient air supply is available to allow appropriate decontamination before removal:

1. Remove any extraneous or disposable clothing, boot covers, outer gloves, and tape.

2. Have assistant loosen and remove the wearer's safety shoes or boots.

3. Have assistant open the suit completely and lift the hood over the head of the wearer and rest it on top of the SCBA tank.

4. Remove arms, one at a time, from suit. Once arms are free, have assistant lift the suit up and away from the SCBA backpack - avoiding any contact between the outside surface of the suit and the wearer's body - and lay the suit out flat behind the wearer. Leave internal gloves on, if any.

5. Sitting, if possible, remove both legs from the suit.

6. Follow procedure for doffing SCBA.

7. After suit is removed, remove internal gloves by rolling them off the hand, inside out.

8. Remove internal clothing and thoroughly cleanse the body.

If the low-pressure wearing alarm has sounded, signifying that approximately 5 minutes of air remain:

1. Remove disposable clothing.

2. Quickly scrub and hose off, especially around the entrance/exit zipper.

3. Open the zipper enough to allow access to the regulator and breathing hose.

4. Follow Steps 1 through 8 of the regular doffing procedure above. Take extra care to avoid contaminating the assistant and wearer.

## TABLE A-4

## SAMPLE PPE INSPECTION CHECKLIST

---

### CLOTHING

Before use:

- Determine that the clothing material is correct for the specified task at hand.
- Visually inspect for:
  - imperfect seams
  - non-uniform coatings
  - tears
  - malfunctioning closures
- Hold up to light and check for pinholes.
- Flex product:
  - observe for cracks
  - observe for other signs of shelf deterioration
- If the product has been used previously, inspect inside and out for signs of chemical attack:
  - discoloration
  - swelling
  - stiffness

During the work task, periodically inspect for:

- Evidence of chemical attack such as discoloration, swelling, stiffening, and softening. Keep in mind, however, that chemical permeation can occur without any visible effects.
- Closure failure
- Tears
- Punctures
- Seam discontinuities

---

## TABLE A-4 (Continued)

## SAMPLE PPE INSPECTION CHECKLIST

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### GLOVES

- Before use, pressurize glove to check for pinholes. Either blow into glove, then roll gauntlet towards fingers or inflate glove and hold under water. In either case, no air should escape.

---

### FULLY-ENCAPSULATING SUITS

Before use:

- Check the operation of pressure relief valves.
- Inspect the fitting of wrists, ankles, and neck.
- Check face shield, if so equipped, for:
  - cracks
  - crazing
  - fogginess

---

### RESPIRATORS

SCBA

- Inspect SCBAs:
  - before and after each use
  - at least monthly when in storage
  - every time they are cleaned
- Check all connections for tightness
- Check material conditions for:
  - signs of pliability
  - signs of deterioration
  - signs of distortion

## TABLE A-4 (Continued)

## SAMPLE PPE INSPECTION CHECKLIST

- Check for proper setting and operation of regulators and valves (according to manufacturers' recommendations).

- Check operation of alarm(s).

- Check face shields and lenses for:

  - cracks
  - crazing
  - fogginess

Supplied-Air Respirators

- Inspect SARs:

  - daily when in use
  - at least monthly when in storage
  - every time they are cleaned

- Inspect air lines prior to each use for cracks, kinks, cuts, frays, and weak areas.

- Check for proper setting and operation of regulators and valves (according to manufacturers' recommendations).

- Check all connections for tightness.

- Check material conditions for:

  - signs of pliability
  - signs of deterioration
  - signs of distortion

- Check face shields and lenses for:

  - cracks
  - crazing
  - fogginess

## TABLE A-4 (Continued)

## SAMPLE PPE INSPECTION CHECKLIST

Air-Purifying Respirators

- Inspect air-purifying respirators:
  - before each use to be sure they have been adequately cleaned
  - after each use
  - during cleaning
  - monthly if in storage for emergency use
- Check material conditions for:
  - signs of pliability
  - signs of deterioration
  - signs of distortion
- Examine cartridge or canisters to ensure that:
  - they are the proper type for the intended use
  - the expiration date has not been passed
  - they have not been opened or used previously
- Check face shields and lenses for:
  - cracks
  - crazing
  - fogginess

# TABLE A-5
# RESPIRATORY PROTECTION STANDARD

## 29 CFR 1910.134

### Minimally Acceptable Program 11 Requirements

1. Written Standard Operating Procedures
2. Respirators Selected on a Basis of Hazard
3. Users Instructed and Trained
4. Workers Should Have Their Own Personal Respirators Where Practical
5. Regular Cleaning and Disinfecting
6. Proper Storage
7. Proper Inspection
8. Surveillance of Work Area Conditions and Worker Exposure
9. Regular Audits of the Program
10. Medical Evaluations
11. Use of Approved Respirators

RESPIRATORY PROTECTION

## TABLE A-6

## CONDITIONS THAT EXCLUDE OR MAY EXCLUDE USE OF AIR-PURIFYING RESPIRATORS

- Oxygen deficiency. (Below 19.5% $O_2$)
- IDLH concentrations of specific substances.
- Entry into an unventilated or confined area where the exposure conditions have not been characterized.
- Presence or potential presence of unidentified contaminants.
- Contaminant concentrations are unknown or exceed designated maximum use concentration(s).
- Identified gases or vapors have inadequate warning properties and the sorbent service life is not known and the unit has no end-of-service-life (ESLI) indicator.
- High relative humidity (may reduce the protection offered by the sorbent).

## TABLE A-7

## COLOR CODE FOR CARTRIDGES AND GAS MASK CANISTERS ANSI K13.1-1973

| Atmospheric Contaminants to be Protected Against | Color Assigned |
|---|---|
| Acid gases | White |
| Organic vapors | Black |
| Ammonia gas | Green |
| Carbon monoxide gas | Blue |
| Acid gases and organic vapors | Yellow |
| Acid gases, ammonia, and organic vapors | Brown |
| Acid gases, ammonia, carbon monoxide, and organic vapors | Red |
| Other vapors and gases not listed above | Olive |
| Radioactive materials (except tritium and noble gas) | Purple |
| Dusts, fumes, and mists (other than radioactive materials) | Orange |

Notes:

(1) A purple stripe shall be used to identify radioactive material in combination with any vapor or gas.

(2) An orange stripe shall be used to identify dusts, fumes, and mists in combination with any vapor or gas.

(3) Where labels only are colored to conform with this table, the canister or cartridge body shall be gray or a metal canister or cartridge body may be left in its natural metallic color.

(4) The user shall refer to the wording of the label to determine the type and degree of protection the canister or cartridge will afford.

## TABLE A-8

## PROTECTION FACTORS*

| | |
|---|---|
| HALF FACE RESPIRATOR: | 10X |
| FULL FACE RESPIRATOR: | 50X |
| POWER AIR PURIFYING RESPIRATOR: | 100X |
| POSITIVE PRESSURE-FULL FACE AIRLINE: | 1000X |
| POSITIVE PRESSURE-FULL FACE AIRLINE WITH ESCAPE BOTTLE: | 1000X |
| POSITIVE PRESSURE-FULL FACE SCBA: | $\leq$1000X |

* For specific information please check manufactures specifications.

*APPENDIX B*
*Decontamination*

# APPENDIX B

# DECONTAMINATION

## General

Personnel involved with hazardous material handling may be exposed to compounds in a number of ways, despite the most stringent protective procedures. Personnel may come in contact with vapors, gases, mists, or particulates in the air, or may come in contact with site media while performing work tasks. Use of monitoring instruments and equipment can also result in exposure to hazardous substances.

In general, decontamination involves scrubbing with a non-phosphate soap/water solution followed by clean water rinses. All disposable items will be disposed of in a dry container. Certain parts of contaminated respirators, such as harness assemblies and leather or cloth components, are difficult to decontaminate. If grossly contaminated, they may have to be discarded. Rubber components can be soaked in soap and water and scrubbed with a brush. In addition to being decontaminated, all respirators, non-disposable protective clothing, and other personal articles must be sanitized before they can be used again, unless they are assigned to individuals. The manufacturer's instructions should be followed in sanitizing the respirator masks. The Site Safety Officer will be responsible for supervising the proper protective equipment.

## Standard PPE Decontamination

The Site Safety Officer will monitor decontamination procedures to ensure their effectiveness. Modifications of the decontamination procedure may be necessary as determined by the Site Safety Officer's observations.

## Level A and Level B - Personal Protection Decontamination Procedure

### Step 1--Segregated Equipment Drop

Deposit equipment (tools, sampling devices, notes, monitoring instruments, radios, etc.) used on the site onto plastic drop cloths.

### Step 2--Boot Covers and Glove Wash

Outer boot covers and outer gloves should be scrubbed with a decontamination solution of detergent and water.

### Step 3–Rinse Off Boot Covers and Gloves

Decontamination solution should be rinsed off boot covers and gloves using generous amounts of water. Repeat as many times as necessary.

### Step 4–Tape Removal

Remove tape from around boots and gloves and place into container with plastic liner.

### Step 5–Boot Cover Removal

Remove disposable boot covers and place into container with plastic liner.

### Step 6–Outer Glove Removal

Remove outer gloves and deposit in container with plastic liner.

### Step 7–Suit/Safety Boot Wash

Completely wash splash suit, SCBA, gloves, and safety boots. Care should be exercised that no water is allowed into the SCBA regulator. It is suggested that the SCBA regulator be wrapped in plastic.

### Step 8–Suit/Safety Boot Rinse

Thoroughly rinse off all decontamination solution from protective clothing.

### Step 9–Tank Changes

This is the last step in the decontamination procedure for those workers wishing to change air tanks and return to the exclusion zone. The worker's air tank is exchanged, new outer glove and boot covers are donned, and joints taped.

### Step 10–Removal of Safety Boots

Remove safety boots and deposit in container with a plastic liner.

### Step 11--SCBA Backpack Removal

Without removing face piece, remove the SCBA backpack and place it on a table. Then disconnect the face piece from the remaining SCBA unit and proceed to the next station.

### Step 12--Splash Suit Removal

With care, remove splash suit. The exterior of the splash suit should not come in contact with any inner layers of clothing.

### Step 13--Inner Glove Wash

The inner gloves should be washed with a mild decontamination solution (detergent/water).

### Step 14--Inner Glove Rinse

Generously rinse inner gloves with water.

### Step 15--Face Piece Removal

Without touching face with gloves, remove face piece. Deposit face piece into a container which has a plastic liner.

### Step 16--Inner Glove Removal

Remove inner glove and deposit in container with plastic liner.

### Step 17--Field Wash

Wash hands and face thoroughly. If highly toxic, skin corrosive, or skin-absorbent materials are know or suspected to be present, take a shower.

## Level C Personal Protection Decontamination Procedure

### Step 1--Segregated Equipment Drop

Deposit equipment used onsite (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability of cross-contamination. During hot weather operations, cool down stations may be set up within this area.

### Step 2--Boot Cover and Glove Wash

Scrub outer boot covers and gloves with decontamination solution or detergent and water.

### Step 3--Boot Cover and Glove Rinse

Rinse off decontamination solution from station 2 using copious amounts of water.

### Step 4--Tape Removal

Remove tape around boots and gloves and deposit in container with plastic liner.

### Step 5--Boot Cover Removal

Remove boot covers and deposit in container with plastic liner.

### Step 6--Outer Glove Removal

Remove outer gloves and deposit in container with plastic liner.

### Step 7--Suit and Boot Wash

Wash splash suit, gloves, and safety boots. Scrub with long-handle scrub brush and decon solution.

**Step 8--Suit and Boot, and Glove Rinse**

Rinse off decon solution using water. Repeat as many times as necessary.

**Step 9--Canister or Mark Change**

If worker leaves exclusion zone to change air tank, this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot covers donned, and joints taped. Worker returns to duty.

**Step 10--Safety Boot Removal**

Remove safety boots and deposit in container with plastic liner.

**Step 11--Splash Suit Removal**

With assistance of helper, remove splash suit. Deposit in container with plastic liner.

**Step 12--Inner Glove Rinse**

Wash liner gloves with decon solution.

**Step 13--Inner Glove Wash**

Rinse inner gloves with water.

**Step 14--Face Piece Removal**

Remove face piece. Deposit in container with plastic liner. Avoid touching face with fingers.

**Step 15--Inner Glove Removal**

Remove inner gloves and deposit in container with liner.

### Step 16--Field Wash

Shower if highly toxic, skin-corrosive or skin adsorbable materials are known or suspected to be present. Wash hands and face if shower is not available.

# *APPENDIX C*
## *Heat Stress Guidelines*

# APPENDIX C

# HEAT STRESS GUIDELINES

## Heat Stress

Wearing PPE puts a hazardous waste worker at considerable risk of developing heat stress. Heat stress can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses at hazardous waste sites, regular monitoring and other preventative precautions are vital.

Individuals vary in their susceptibility to heat stress. Factors that may predispose someone to heat stress include the following:

- Lack of physical fitness;
- Lack of acclimatization;
- Age;
- Dehydration;
- Obesity;
- Alcohol and drug use;
- Infection;
- Sunburn;
- Diarrhea; and
- Chronic disease.

Reduced work tolerance and the increased risk of excessive heat stress are directly influenced by the amount and type of PPE worn. PPE adds weight and bulk, severely reduces the body's access to normal heat exchange mechanisms (evaporation, convection, and radiation), and increases energy expenditure. Therefore, when selecting PPE, each item's benefit should be carefully evaluated in relation to its potential for increasing the risk of heat stress. Once PPE is selected, the safe duration of work/rest periods should be determined based on the following criteria:

- Anticipated work rate;
- Ambient temperature and other environmental factors;
- Type of protective ensemble; and
- Individual worker characteristics and fitness.

## Prevention

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat injuries. To avoid heat stress, management should take the following steps:

- Adjust work schedules: modify work/rest schedules according to monitoring requirements. Mandate work slowdowns as needed. Rotate personnel: alternate job functions to minimize overstress or overexertion at one task. Add additional personnel to work teams. Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.

- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.

- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.e., 8 fluid ounces (0.23 liter) of water must be ingested for approximately every 8 ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:

  - Maintain water temperature at 50° to 60°F (10° to 15.6°C);

  - Provide small disposable cups that hold approximately 4 ounces (0.1 liter);

  - Have workers drink 16 ounces (0.5 liter) of fluid (preferably water or dilute drinks) before beginning work;

  - Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight; and

  - Weigh workers before and after work to determine if fluid replacement is adequate.

- Encourage workers to maintain an optimal level of physical fitness: Where indicated, acclimatize workers to site work conditions: temperature, protective clothing, and workload (see Level of Acclimatization at the end of this chapter). Urge workers to maintain normal weight levels.

- Provide cooling devices to aid natural body heat exchange during prolonged work or severe heat exposure. Cooling devices include the following:

  - Field showers or hose-down areas to reduce body temperature and/or to cool off protective clothing; and

  - Cooling jackets, vests, or suits.

- Train workers to recognize and treat heat stress. As part of training, identify the signs and symptoms of heat stress.

## Other Factors

Using PPE decreases worker performance. The magnitude of this effect varies considerably, depending on both the individual and the PPE ensemble used. This section discusses the demonstrated physiological responses to PPE, the individual human characteristics that are factors in these responses, and some of the precautionary and training measures that should be taken to avoid PPE-induced injury.

The following physiological factors may affect worker ability to function using PPE:

- Physical condition;
- Level of acclimatization;
- Age;
- Gender; and
- Weight.

## Physical Condition

Physical fitness is a major factor influencing a person's ability to perform work under heat stress. The more fit someone is, the more work they can safely perform. At a given level of work, a fit person will have the following physical reactions compared to an unfit person:

- Less physiological strain;
- A lower heart rate;
- A lower body temperature, which indicates less retained body heat (a rise in internal temperature precipitates heat injury);
- A more efficient sweating mechanism;
- Slightly lower oxygen consumption; and
- Slightly lower carbon dioxide production.

## Level of Acclimatization

The degree to which a worker's body has physiologically adjusted or acclimatized to working under hot conditions affects his or her ability to work. Acclimatized individuals generally have lower heart rates and body temperatures than unacclimatized individuals and sweat sooner and more profusely. This enables them to maintain lower skin and body temperatures at a given level of environmental heat and work load than unacclimatized workers. Sweat composition also becomes more dilute with acclimatization, which reduces salt loss.

Acclimatization can occur after just a few days of exposure to a hot environment. NIOSH recommends a progressive six-day acclimatization period for the unacclimatized worker before allowing him/her to do full work on a hot job. Under this regimen, the first day of work onsite is begun using only 50 percent of the anticipated workload and exposure time, and 10 percent is added each day through day six. With fit or trained individuals, the acclimatization period may be shortened two or three days. However, workers can lose acclimatization in a matter of days, and work regimens should be adjusted to account for this.

When enclosed in an impermeable suit, fit acclimatized individuals sweat more profusely than unfit or unacclimatized individuals and may therefore actually face a greater danger of heat exhaustion due to rapid dehydration. This can be prevented by consuming adequate quantities of water. See the previous section on Prevention for additional information.

## Age

Generally, maximum work capacity declines with increasing age, but this is not always the case. Active, well-conditioned seniors often have performance capabilities equal to or greater than young sedentary individuals. However, there is some evidence, indicated by lower sweat rates and higher body core temperatures, that older individuals are less effective in compensating for a given level of environmental heat and work loads. At moderate thermal loads, however, the physiological responses of "young" and "old" are similar, and performance is not affected.

Age should not be the sole criterion for judging whether or not an individual should be subjected to moderate heat stress. Fitness level is a more important factor.

## Gender

The literature indicates that females tolerate heat stress at least as well as their male counterparts. Generally, a female's work capacity averages 10 to 30 percent less than that of a male. The primary reasons for this are the greater oxygen-carrying capacity and the stronger heart in the male. However, a similar situation exists as with aging: not all males have greater work capacities than all females.

## Weight

The ability of a body to dissipate heat depends on the ratio of its surface area to its mass (surface area/weight). Heat loss (dissipation) is a function of surface area, and heat production depends on mass. Therefore, heat balance is described by the ratio of the two.

Since overweight individuals (those with a low ratio) produce more heat per unit of surface area than thin individuals (those with a high ratio), overweight individuals should be given special consideration in heat stress situations. However, when wearing impermeable clothing, the weight of an individual is not a critical factor in determining the ability to dissipate excess heat.

## Effects of Heat

During normal body processes, a predictable amount of heat is generated. Interference with the body's elimination of heat leads to its accumulation, and thus the elevation of body temperature. The person is then said to have a fever. When this occurs, a vicious cycle is produced in which certain body processes speed up and generate additional heat. Then the body must eliminate not only the normal body heat, but the additional heat as well.

A hot job, a hot day, and high humidity can add up to heat stress. Too much heat stress can lead to heat illness which includes, heat cramps, heat exhaustion, and heat stroke. It is the body's way of saying it cannot take the heat.

## Heat Cramps

Heat cramps usually affect people who work in hot environments and perspire a great deal.

Causes:

- A loss of electrolytes from the body; and
- Drinking iced water or other liquids either too quickly or in too large a quantity.

Symptoms:

- Muscle cramps in legs and abdomen;
- Pain accompanying cramps;
- Faintness; and
- Profuse perspiration.

Treatment:

- Move to a cool, shaded area and rest.
- Drink sips of cool but not "cold" liquids such as "Gatorade" or dilute fruit juices;
- Apply manual pressure to the cramped muscle; and
- If there is indication of a more serious problem, transport the individual to a medical facility.

## Heat Exhaustion

Heat exhaustion occurs in individuals working in hot environments, and may be associated with heat cramps.

Causes:

- Heat is transported from the interior of the body to the surface by the blood. Blood vessels become dilated, and large amounts of blood pool in the skin. When standing, blood will pool in the lower extremities and may eventually lead to physical collapse due to an inadequate return of blood to the heart.

Symptoms:

- Clammy, pale skin;
- Dizziness;
- Confusion;
- Profuse sweating;
- Slurred speech;
- Weak pulse;
- Rapid and usually shallow breathing;
- Generalized weakness; and
- Fainting.

Treatment:

- Move the person to a cool place;
- Remove as much clothing as possible;
- Give the person sips of cool water, "Gatorade," or dilute fruit juice, when conscious;
- Fan the patient continually to remove heat by convection--do not allow chilling or overcooling; and
- If there is any indication of a more serious problem, treat individual for shock and transport to the nearest medical facility.

## Heat Stroke

Heat stroke is a profound disturbance of the heat regulating mechanism in the body, associated with high fever and collapse. It may be fatal.

Causes:
- Direct exposure to sun;
- Poor air circulation;
- Poor physical condition;
- Advanced age (over 40); and
- Alcoholics are extremely susceptible.

Symptoms:
- Sudden onset;
- Dry, hot, and flushed skin;
- Dilated pupils;
- Early loss of consciousness;
- Pounding and fast pulse;
- Muscle twitching, growing into convulsions; and
- Body temperature reaching 105° to 106° or higher.

Treatment:
- This is a true emergency;
  - Immediately transport individual to a medical facility;
  - Move to a cool place;
  - Remove as much clothing as possible;
  - Try to reduce body temperature by dousing the body with water or wrap in a cool, set sheet; and
  - Place cold packs under arms, around neck, and at the ankles.

## REMINDERS TO AVOID HEAT ILLNESS

- Drink cool liquids such as "Gatorade" frequently;
- Avoid ice cold drinks;
- Avoid carbonated beverages--the sugar in them blocks water adsorption in the body;
- Rest in a cool area;
- Limit your intake of alcoholic beverages--they are dehydrating;
- Eat well balanced meals;
- Stay physically fit--keep your weight under control;
- If you are on medication, ask your physician about working in hot environments;
- At first signs of heat stress, get out of the heat, find a cool spot where you can rest for a few minutes;
- Look out for co-workers showing early signs of heat stress; and
- Revise work schedules, when necessary, to take advantage of the cooler parts of the day (i.e., 5 to 11 a.m. and 6 p.m. to nightfall).

## HEAT STRESS MONITORING

When protective clothing must be worn, especially in Levels A and B, and sometimes C, suggested guidelines relating ambient temperature and maximum wearing time per excursion are:

| Ambient Temperature | Maximum Wearing Time Per Excursion |
|---|---|
| Above 90°F | 15 Minutes |
| 85 - 90°F | 30 Minutes |
| 80 - 85°F | 60 Minutes |
| 70 - 89°F | 90 Minutes |
| 60 - 70°F | 120 Minutes |
| 50 - 60°F | 180 Minutes |

Maximum wearing times should be separated by a minimum of 15 minute rest cycles.

Level D guidelines related to ambient temperatures:

| Ambient Temperature | Rest Interval |
|---|---|
| 50 - 85°F | Schedule a drink break every 90 min. |
| Above 85°F | Schedule a drink break and a 15 min. rest in a shaded area every 60 minutes. |

Employees should utilize self heat stress monitoring and a log sheet. A thermometer shall be provided.

### Heart Rate Evaluation

- Establish heart rates early in the morning prior to site activities;
- Take a 30-second radial pulse and multiply by 2;
- Repeat this procedure early during rest periods; and
- If the heart rate exceeds 110 beats per minute, increase the length of the rest period.

## Body Temperature

- Log body temperatures using an oral thermometer;
- Temperatures should be taken prior to site activities and early during rest periods (prior to eating, drinking, smoking, etc.); and
- If the body temperature exceeds 99.0°F, the length of the rest period must be extended and the employee may not return to site activities until the body temperature returns to 99.0°F or below.

# HEAT STRESS MONITORING

NAME: _____

| DATE | TIME | HEART RATE | BODY TEMP | REST MINS. | FLUID INTAKE |
|---|---|---|---|---|---|
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## PERMISSIBLE HEAT EXPOSURE THRESHOLD LIMIT VALUES

| | WORK LOAD | | |
|---|---|---|---|
| WORK-REST REGIMEN | LIGHT | MODERATE | HEAVY |
| Continuous work | 86° F | 80° F | 77° F |
| 75% Work - 25% Rest, each hour | 87° F | 82.4° F | 78.6° F |
| 50% Work - 50% Rest, each hour | 88.5° F | 84.9° F | 82.2° F |
| 25% Work - 75% Rest, each hour | 89.9° F | 87.9° F | 86° F |

NOTE: This table of TLVs are valid for light summer clothing as customarily worn by workers when working under hot environment conditions.

TLVs are valid for acclimated workers who are physically fit.

# *APPENDIX D*
## *Cold Stress*

## APPENDIX D

## COLD STRESS
**(Adopted from Threshold Limit Values and Biological Exposure Indices for 1988 and 1989)**

These Threshold Limit Values (TLVs) are intended to protect workers from the severest effects of cold stress (hypothermia) and cold injury and to describe exposures to cold working conditions under which it is believed that nearly all workers can be repeatedly exposed without adverse health effects. The TLV objective is to prevent the deep body core temperature from falling below 36° C and to prevent cold injury to body extremities. Deep body temperature is the core temperature of the body as determined by rectal temperature measurements. For a single, occasional exposure to a cold environment, a drop in core temperature to no lower than 35° C should be permitted. In addition to provisions for total body protection, the TLV objective is to protect all parts of the body with emphasis on hands, feet, and head from cold injury.

### Introduction

Fatal exposures to cold among workers have almost always resulted from accidental exposures involving failure to escape from low environmental air temperatures or from immersion in low temperature water. The single most important aspect of life-threatening hypothermia is the fall in the deep core temperature of the body. Workers should be protected from exposure to cold so that the deep core temperature does not fall below 36° C (96.8° F); lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision making, or loss of consciousness with the threat of fatal consequences.

Pain in the extremities may be the first early warning of danger to cold stress. During exposure to cold, maximum severe shivering develops when the body temperature has fallen to 35° C (95° F). This must be taken as a sign of danger to the workers and exposure to cold should be immediately terminated for any workers when severe shivering becomes evident. Useful physical or mental work is limited when severe shivering occurs.

Since prolonged exposure to cold air, or to immersion in cold water, at temperatures well above freezing can lead to dangerous hypothermia, whole body protection must be provided.

1. Adequate insulating clothing to maintain core temperatures above 36° C must be provided to workers if work is performed in air temperatures below 4° C (40° F). Wind chill factor[1] or the cooling power of the air is a critical factor. The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required. An equivalent chill temperature chart relating the actual dry bulb air temperature and the wind velocity is presented in Table D-1. The equivalent chill temperature should be used when estimating the combined cooling effect of wind and low air temperatures on exposed skin or when determining clothing insulation requirements to maintain the deep body core temperature.

2. Unless there are unusual or extenuating circumstances, cold injury to other than hands, feet, and head is not likely to occur without the development of the initial signs of hypothermia. Older workers or workers with circulatory problems require special precautionary protection against cold injury. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are among the special precautions which would be considered. The precautionary actions to be taken will depend upon the physical condition of the worker and should be determined with the advice of a physician with knowledge of the cold stress factors and the medical condition of the worker.

## Evaluation and Control

For exposed skin, continuous exposure should not be permitted when the air speed and temperature results in an equivalent chill temperature of -32° C (-25° F). Superficial or deep local tissue freezing will occur only at temperatures below -1° C, regardless of wind speed.

At air temperatures of 2° C (35.6° ) or less it is imperative that workers who become immersed in water or whose clothing becomes wet be immediately provided a change of clothing and be treated for hypothermia.

Recommended limits for properly clothed workers for periods of work at temperatures below freezing are shown in Table D-2.

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[1]Wind chill factor is a unit of heat loss from a body defined in watts per meter squared per hour being a function of the air temperature and wind velocity upon the exposed body.

Special protection of the hands is required to maintain manual dexterity for the prevention accidents:

1. If fine work is to be performed with bare hands for more than 10-20 minutes in an environment below 16° C (60° F), special provisions should be established for keeping the workers' hands warm. For this purpose, warm air jets, radiant heaters (fuel burner or electric radiator), or contact warm plates may be utilized. Metal handles of tools and control bars shall be covered by thermal insulating material at temperatures below -1° C (30° F).

2. If the air temperature falls below 16° C (60° F) for sedentary, 4° C (40° F) for light, -7° C (20° F) for moderate work and fine manual dexterity is not required then gloves shall be used by the workers.

To prevent contact frostbite, the workers should wear anticontact gloves.

1. When cold surfaces below -7° C (20° F) are within reach, a warning should be given to each worker by his supervisor to prevent inadvertent contact by bare skin.

2. If the air temperature is -17° C (0° F) or less, the hands should be protected by mittens. Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens.

Provisions for additional total body protection is required if work is performed in an environment at or below 4° C (40° F). The workers shall wear cold protective clothing appropriate for the level of cold and physical activity:

1. If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind shall be reduced by shielding the work area, or by wearing an easily removable outer windbreak layer garment. Wind chill cooling rates are illustrated in Figure D-1 and Table D-3.

2. If only light work is involved and if the clothing on the worker becomes wet on the job site, the outer layer of the clothing in use may be of a type impermeable to water. With more severe work under such conditions, the outer layer should be water repellent, and the outerwear should be changed as it becomes wetted. The outer garments must include provisions for easy ventilation in order to prevent wetting of inner layers by sweat. If work is done at normal temperatures or in a hot environment before entering the cold area, the employee shall make sure that his clothing is not wet as a consequence of sweating. If his clothing is wet, the employee shall change into dry clothes before entering the cold area. The workers shall change socks and any removable felt insoles at regular daily intervals or use vapor barrier boots. The optimal frequency of change shall be determined

empirically, and will vary individually and according to the type of shoe worn and how much the individual's feet sweat.

3. If extremities, ears, toes, and nose cannot be protected sufficiently to prevent sensation of excessive cold or frostbite by handwear, footwear, and face masks, these protective items shall be supplied in auxiliary heated versions.

4. If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work shall be modified or suspended until adequate clothing is made available or until weather conditions improve.

5. Workers handling evaporative liquid (gasoline, alcohol, or cleaning fluids) at air temperatures below 4° C (40° F) shall take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling. Special note should be taken of the particularly acute effects of splashes of "cryogenic fluids" or those liquids with a boiling point only just above ambient temperatures.

## Work-Warming Regimen

If work is performed continuously in the cold at an equivalent chill temperature (ECT) or below -7° C (20° F), heated warming shelters (tents, cabins, rest rooms, etc.) shall be made available nearby and the workers should be encouraged to use these shelters at regular intervals, the frequency depending on the severity of the environmental exposure. The onset of heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability, or euphoria are indications for immediate return to the shelter. When entering the heated shelter, the outer layer of clothing shall be removed and the remainder of the clothing loosened to permit sweat evaporation, or a change of dry work clothing provided. A change of dry work clothing shall be provided as necessary to prevent workers from returning to their work in wet clothing. Dehydration, or the loss of body fluids, occurs insidiously in the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm, sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of a diuretic and circulatory effect.

For work practices at or below -12° C (10° F) ECT the following shall apply:

1. The worker shall be under constant protective observation (buddy system or supervision).

2. The work rate should not be so high as to cause heavy sweating that will result in wet clothing; if heavy work must be done, rest periods must be taken in heated shelters and opportunity for changing into dry clothing shall be provided.

3. New employees shall not be required to work full-time in cold in the first days until they become accustomed to the working conditions and require protective clothing.

4. The weight and bulkiness of clothing shall be included in estimating the required work performance and weights to be lifted by the worker.

5. The work shall be arranged in such a way that sitting still or standing still for long periods is minimized. Unprotected metal chair seats shall not be used. The worker should be protected from drafts to the greatest extent possible.

6. The workers shall be instructed in safety and health procedures. The training program shall include, as a minimum, instruction in:

   a. Proper rewarming procedures and appropriate first aid treatment;
   b. Proper clothing practices;
   c. Proper eating and drinking habits;
   d. Recognition of impending frostbite;
   e. Recognition signs and symptoms of impending hypothermia or excessive cooling of the body even when shivering does not occur; and
   f. Safe work practices.

## Special Workplace Recommendations

Special design requirements for refrigerator rooms include the following:

1. In refrigerator rooms, the air velocity should be minimized as much as possible and should not exceed 1 meter/sec (200 fpm) at the job site. This can be achieved by properly designed air distribution systems.

2. Special wind protective clothing shall be provided based upon existing air velocities to which workers are exposed.

Special caution shall be exercised when working with toxic substances and when workers are exposed to vibration. Cold exposure may require reduced exposure limits.

Eye protection for workers employed out-of-doors in a snow- and/or ice-covered terrain shall be supplied. Special safety goggles to protect against ultraviolet light and glare (which can produce temporary conjunctivitis and/or temporary loss of vision) and blowing ice crystals are required when there is an expanse of snow coverage causing a potential eye exposure hazard.

Workplace monitoring is required as follows:

1. Suitable thermometry should be arranged at any workplace where the environmental temperature is blow 16° C (60° F) to enable overall compliance with the requirements of the TLV to be maintained.

2. Whenever the air temperature at a workplace falls below -1° C (30° F), the dry bulb temperature should be measured and recorded at least every 4 hours.

3. In indoor workplaces, the wind speed should also be recorded at least every 4 hours whenever the rate of air movement exceeds 2 meters per second (5 mph).

4. In outdoor work situations, the wind speed should be measured and recorded together with the air temperature whenever the air temperature is below -1° C (30° F).

5. The equivalent chill temperature shall be obtained from Table D-1 in all cases where air movement measurements are required, and shall be recorded with the other data whenever the equivalent chill temperature is below -7° C (20° F).

Employees shall be excluded from work in cold at -1° C (30° F) or below if they are suffering from diseases or taking medication which interferes with normal body temperature regulation or reduces tolerance to work in cold environments. Workers who are routinely exposed to temperatures below -24° C (-10° F) with wind speeds less than five miles per hour, or air temperatures below -18° C (0° F) with wind speeds above five miles per hour should be medically certified as suitable for such exposures.

Trauma sustained in freezing or subzero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment.

## TABLE D-3

## WIND CHILL COOLING RATE EFFECTS*

| Wind Chill Rates ($Watts/m^2$) | Comments/Effects |
|---|---|
| 700 | Conditions considered comfortable when dressed for skiing. |
| 1200 | Conditions no longer pleasant for outdoor activities on overcast days. |
| 1400 | Conditions no longer pleasant for outdoor activities on sunny days. |
| 1600 | Freezing of exposed skin begins for most people depending on the degree of activity and the amount of sunshine. |
| 2300 | Conditions for outdoor travel such as walking become dangerous. Exposed areas of the face freeze in less than one minute for the average person. |
| 2700 | Exposed flesh will freeze within half a minute for the average person. |

*Adapted from Canadian Department of the Environment, Atmospheric Environment Service.

# *APPENDIX E*
## *Excavation, Trenching, and Shoring*

## APPENDIX E

## EXCAVATION, TRENCHING, AND SHORING

The main concerns of trenching and excavation are ground control and fall prevention. Before an excavation is made, a thorough effort should be made to determine whether underground obstructions (such as sewer, telephone, fuel, water, or electrical lines) or aboveground hazards may be encountered. Utility lines should be properly supported during excavation. The appropriate utility personnel should be contacted to inform them of the proposed site excavation work and to receive any additional advice based on their experience. Natural hazards, such as boulders and trees, should be removed or controlled before excavation begins if they might create a hazard to workers.

Very specific guidelines exist to protect employees from moving ground during excavation. They are based on ground type and excavation depth. The walls and faces of all excavations to which employees are exposed should be guarded by a shoring system, a sloping of the ground, or another equivalent means. All slopes should be excavated to a degree which accommodates the ground's unique ability to slide. Soil types listed below from most likely to least likely to slide:

- Well-rounded loose sand;
- Compacted sharp sand;
- Average soils;
- Compact angular gravel; and
- Solid rock, shale, or cemented sand and gravel.

Not all excavations need to be shored or sloped. The purpose of these precautions is to prevent crushing injury or suffocation. **Banks more than five feet high should be shored with materials in good condition or laid back to a stable slope, based on ground type.** Trenches less than five feet deep should also be protected if it appears that an injury may be caused by hazardous ground movement. Walkways, sidewalks, and runways should be free of excavated materials to prevent falls. Planks used for raised walkways should be securely fastened at each end.

It is necessary to consider unexpected events or past ground work which might affect the security of the excavation site.

Additional precautions should be taken to prevent slides or cave-ins when trenches or excavations are made near backfilled excavations or where excavations are subject to external vibrations such as railway or highway traffic or machinery. Rain storms may seriously compromise the stability of excavation surfaces. A competent person should ensure that no weather-related decrease in safety has occurred.

Diversion ditches, dikes, or other suitable means should be used to prevent surface water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation. Water should not be allowed to accumulate in an excavation. If it is necessary to place or operate power shovels, derricks, trucks, materials, or other heavy objects on a level above and near an excavation, the side of the excavation should be braced as necessary to resist the extra pressure from such loads. When mobile equipment is used next to excavations, substantial stop logs or barricades shall be installed. If possible, the grade should be away from the excavation.

*APPENDIX F*
*MSDSs for Lead and Arsenic*

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*Material Safety Data Sheets Collection:*

**Sheet No. 296**
**Arsenic and Compounds**

Issued: 4/90

## Section 1. Material Identification

31

**Arsenic Description:** Obtained from flue dust of copper and lead smelters as white arsenic (arsenic trioxide). Reduction with charcoal and sublimation in an $N_2$ current yields pure arsenic. Metallic arsenic is used for hardening copper, lead, and alloys; as a doping agent in germanium and silicon solid-state products, special solders, and medicine; and to make gallium arsenide for dipoles and other electronic devices. Arsenic compounds are used in manufacturing certain types of glass; in textile printing, tanning, taxidermy, pharmaceuticals, insecticides and fungicides, pigment production, and antifouling paints; and to control sludge formation in lubricating oils. Arsenic trioxide is the source for 97% of all arsenic products.
**Other Designations:** CAS No. 7440-38-2; arsen; arsenic black; As; gray arsenic; metallic arsenic.
**Manufacturer:** Contact your supplier or distributor. Consult the latest *Chemicalweek Buyers' Guide*[73] for a suppliers list.

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## Section 2. Ingredients and Occupational Exposure Limits

Arsenic and soluble compounds, as As

**OSHA PEL**
8-hr TWA: 0.5 mg/m³,* 0.01 mg/m³†

**ACGIH TLV, 1989-90**
TLV-TWA: 0.2 mg/m³

**NIOSH REL, 1987**
Ceiling: 0.002 mg/m³

**Toxicity Data‡**
Man, oral, $TD_{Lo}$: 76 mg/kg administered intermittently over a 12-year period affects the liver (tumors) and blood (hemorrhage)
Man, oral: 7857 mg/kg administered over 55 years produces gastrointestinal (in the structure or function of the esophagus), blood (hemorrhage), and skin and appendage (dermatitis) changes
Rat, oral, $TC_{Lo}$: 605 µg/kg administered to a 35-week pregnant rat affects fertility (pre- and post-implantation mortality)

* Organic compounds.
† Inorganic compounds.
‡ See NIOSH, *RTECS* (CG0525000), for additional mutative, reproductive, tumorigenic, and toxicity data.

## Section 3. Physical Data*

**Boiling Point:** sublimes at 1134 °F/612 °C
**Melting Point:** 1497 °F/814 °C
**Vapor Pressure:** 1 mm at 702 °F/372 °C (sublimes)
**Atomic Weight:** 74.92
**Density:** 5.724 at 57 °F/14 °C
**Water Solubility:** Insoluble†

**Appearance and Odor:** A brittle, crystalline, silvery to black metalloid. Odorless.

* This data pertains to arsenic only.
† Arsenic is soluble in nitric acid ($HNO_3$).

## Section 4. Fire and Explosion Data

| Flash Point: None reported | Autoignition Temperature: None reported | LEL: None reported | UEL: None reported |
|---|---|---|---|

**Extinguishing Media:** Use dry chemical, $CO_2$, water spray, or foam to fight fires.
**Unusual Fire or Explosion Hazards:** Flammable and slightly explosive in the form of dust when exposed to heat or flame.
**Special Fire-fighting Procedures:** Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode. Be aware of runoff from fire control methods. Do not release to sewers or waterways.

## Section 5. Reactivity Data

**Stability/Polymerization:** Arsenic is stable at room temperature in closed containers under normal storage and handling conditions. Hazardous polymerization cannot occur.
**Chemical Incompatibilities:** Arsenic can react vigorously on contact with powerful oxidizers such as bromates, peroxides, chlorates, iodates, lithium, silver nitrate, potassium nitrate, potassium permanganate, and chromium (VI) oxide. This material is also incompatible with halogens, bromine azide, palladium, dirubidium acetylide, zinc, and platinum.
**Hazardous Products of Decomposition:** Thermal oxidative decomposition of arsenic and its compounds produces irritating or poisonous gases.

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## Section 6. Health Hazard Data

**Carcinogenicity:** The IARC, NTP, and OSHA list arsenic as a human carcinogen (Group 1). This evaluation applies to arsenic and arsenic com-unds as a whole, and not necessarily to all individual chemicals within the group. Studies report that both the trivalent and pentavalent ipounds are strongly implicated as causes of skin, lung, and lymphatic cancers. Experimental studies have shown that arsenic has tumorigenic .d teratogenic effects in laboratory animals.
**Summary of Risks:** Arsenic compounds are irritants of the skin, mucous membranes, and eyes. The moist mucous membranes are most sensitive to irritation. Prolonged contact results in local hyperemia (blood congestion) and later vesicular or pustular eruption. Epidermal carcinoma is a reported risk of exposure. Peripheral neuropathy (degenerative state of the nervous system) is common after acute or chronic arsenic poisoning. Symptoms include decreased sensation to touch, pinprick, and temperature; loss of vibration sense; and profound muscle weakness and wasting. Other complications of acute and chronic arsenic poisoning are encephalopathy (alterations of brain structure) and toxic delirium.
**Medical Conditions Aggravated by Long-Term Exposure:** Damage to the liver, nervous, and hematopoietic (responsible for the formation of blood or blood cells in the body) system may be permanent. Pulmonary and lymphatic cancer may also occur.
**Target Organs:** Liver, kidneys, skin, lungs, lymphatic system.
**Primary Entry Routes:** Inhalation, ingestion of dust and fumes, via skin absorption.
**Acute Effects:** Acute industrial intoxication is more likely to arise from inhalation of arsine. However, with corrosive arsenical vapors, conjunctivitis, eyelid edema, and even corneal erosion may result. Inhalation may result in nasal irritation with perforation of the septum, cough, chest pain, hoarseness, pharyngitis, and inflammation of the mouth. If ingested, metallic or garlic taste, intense thirst, nausea, vomiting, abdominal pain, diarrhea, and cardiovascular arrhythmias (heartbeat irregularities) may occur. Symptoms generally occur within 30 minutes, but may be delayed for several hours if ingested with food. Acute poisoning may result in acute hemolysis (breakdown of red blood cells).
**Chronic Effects:** Chronic symptoms include weight loss, hair loss, nausea, and diarrhea alternating with constipation, palmar and plantar hyperkeratoses (thickening of the corneous layer of skin on palms and soles of feet), and skin eruptions, and peripheral neuritis (inflammation of the nerves). *Leukemia, bone marrow depression, or aplastic anemia (dysfunctioning of blood-forming organs) may occur after chronic exposure.*
**FIRST AID**
**Eyes:** Flush immediately, including under the eyelids, gently but thoroughly with flooding amounts of running water for at least 15 min.
**Skin:** *Quickly* remove contaminated clothing. After rinsing affected skin with flooding amounts of water, wash it with soap and water.
**Inhalation:** Remove exposed person to fresh air and support breathing as needed.
**Ingestion:** Never give anything by mouth to an unconscious or convulsing person. If ingested, have a *conscious* person drink 1 to 2 glasses of water, then induce repeated vomiting until vomit is clear.
**After first aid, get appropriate in-plant, paramedic, or community medical support.**
**Physician's Note:** If emesis is unsuccessful after two doses of Ipecac, consider gastric lavage. Monitor urine arsenic level. Alkalinization of urine may help prevent disposition of red cell breakdown products in renal tubular cells. If acute exposure is significant, maintain high urine output and monitor volume status, preferably with central venous pressure line. Abdominal X-rays should be done routinely for all ingestions. Chelation therapy with BAL, followed by n-penicillamine is recommended, but specific dosing guidelines are not clearly established.

## Section 7. Spill, Leak, and Disposal Procedures

**Spill/Leak:** Notify safety personnel of spill, evacuate all unnecessary personnel, remove all heat and ignition sources, and provide adequate ventilation. Cleanup personnel should protect against dust inhalation and contact with skin and eyes. Use nonsparking tools. With a clean shovel, scoop material into a clean, dry container and cover. Absorb liquid material with sand or noncombustible inert material and place in disposal containers. Do not release to sewers, drains, or waterways. Follow applicable OSHA regulations (29 CFR 1910.120).
**Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

**EPA Designations***
`CRA Hazardous Waste (40 CFR 261.33): Not listed
.sted as a CERCLA Hazardous Substance† (40 CFR 302.4), Reportable Quantity (RQ): 1 lb (0.454 kg) [† per Clean Water Act, Sec. 307(a); per Clean Air Act, Sec. 112]
SARA Extremely Hazardous Substance (40 CFR 355): Not listed
Listed as a SARA Toxic Chemical (40 CFR 372.65)

**OSHA Designations‡**
Air Contaminant (29 CFR 1910.1000, Subpart Z): Not listed

* Designations for arsenic only.
‡ Listed as arsenic organic compounds (as As).

## Section 8. Special Protection Data

**Goggles:** Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).
**Respirator:** Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA.
**Warning:** Air-purifying respirators do *not* protect workers in oxygen-deficient atmospheres.
**Other:** Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact.
**Ventilation:** Provide general and local explosion-proof ventilation systems to maintain airborne concentrations below the OSHA PELs, ACGIH TLVs, and NIOSH REL (Sec. 2). Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.[107]
**Safety Stations:** Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.
**Contaminated Equipment:** Never wear contact lenses in the work area: soft lenses may absorb, and all lenses concentrate, irritants. Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.
**Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

## Section 9. Special Precautions and Comments

**Storage Requirements:** Store in closed, properly labeled, containers in a cool, well-ventilated area away from all incompatible materials (Sec. 5) and heat and ignition sources. Protect containers from physical damage.
**Engineering Controls:** Avoid inhalation or ingestion of dust and fumes, and skin or eye contact. Practice good personal hygiene and housekeeping procedures. Use only with adequate ventilation and appropriate personal protective gear. Institute a respiratory protection program with training, maintenance, inspection, and evaluation. All engineering systems should be of maximum explosion-proof design and electrically grounded and bonded. Provide preplacement and annual physical examination with emphasis on the skin, respiratory system, and blood.

**Transportation Data (49 CFR 172.101, .102)**

| | |
|---|---|
| **DOT Shipping Name:** Arsenic, solid | **IMO Shipping Name:** Arsenic, metallic |
| **DOT Hazard Class:** Poison B | **IMO Hazard Class:** 6.1 |
| *ID No.: UN1558* | **IMO Label:** Poison |
| **DOT Label:** Poison | **IMDG Packaging Group:** II |
| **DOT Packaging Requirements:** 173.366 | **ID No.:** UN1558 |
| **DOT Packaging Exceptions:** 173.364 | |

***MSDS Collection* References:** 7, 26, 38, 53, 73, 85, 87, 88, 89, 100, 103, 109, 123, 124, 126, 127, 130, 136, 138
**Prepared by:** MJ Allison, BS; **Industrial Hygiene Review:** DJ Wilson, CIH; **Medical Review:** MJ Hardies, MD M4

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*Material Safety Data Sheets Collection:*

Sheet No. 713
Lead (Inorganic)

Issued: 8/90

## Section 1. Material Identification

32

**Lead (Inorganic) (Pb) Description:** Exists widely throughout the world in a number of ores. Its main commercial source is galena (lead sulphide). Lead mineral is separated from crude ores by blast-furnace smelting, drossing, or electrolytic refining. Lead is used mostly in manufacturing storage batteries. Other uses are in manufacturing tetraethyllead and both organic and inorganic lead compounds in ceramics, plastics, and electronic devices; in producing ammunition, solder, cable covering, sheet lead, and other metal products (brass, pipes, caulking); in metallurgy; in weights and as ballast; as a chemical intermediate for lead alkyls and pigments; as a construction material for the tank linings, piping, and equipment used to handle the corrosive gases and liquids used in sulfuric acid manufacturing, petroleum refining, halogenation, sulfonation, extraction, and condensation; and for x-ray and atomic radiation protection.
**Other Designations:** CAS No. 7439-92-1, lead oxide; lead salts, inorganic; metallic lead; plumbum.
**Manufacturer:** Contact your supplier or distributor. Consult the latest *Chemicalweek Buyers' Guide*(TM) for a suppliers list.

| | |
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**Cautions:** *Inorganic lead is a potent systemic poison.* Organic lead (for example, tetraethyl lead) has severe, but different, health effects. Occupational lead poisoning is due to inhalation of dust and fumes. Major affected organ systems are the nervous, blood, and reproductive systems, and kidneys. Health impairment or disease may result from a severe acute short- or long-term exposure.

## Section 2. Ingredients and Occupational Exposure Limits

Lead (inorganic) fumes and dusts, as Pb, ca 100%

**1989 OSHA PELs (Lead, inorganic compounds)**
8-hr TWA: 50 µg/m³
Action Level TWA*: 30 µg/m³

**29 CFR 1910.1025 Lead Standard**
Blood Lead Level: 40 µg/100 g

**1989-90 ACGIH TLV (Lead, inorganic, fumes and dusts)**
TLV-TWA: 150 µg/m³

**1988 NIOSH REL**
10-hr TWA: <100 µg/m³

**1985-86 Toxicity Data†**
Human, inhalation, $TC_{Lo}$: 10 µg/m³ affects gastrointestinal tract and liver
Human, oral, $TD_{Lo}$: 450 mg/kg ingested over 6 yr affects peripheral and central nervous systems
Rat, oral, $TD_{Lo}$: 790 mg/kg affects multigeneration reproduction

* Action level applies to employee exposure without regard to respirator use.
† See NIOSH, *RTECS* (OF7525000), for additional mutative, reproductive, and toxicity data.

## Section 3. Physical Data

**Boiling Point:** 3164 °F (1740 °C)
**Melting Point:** 621.3 °F (327.4 °C)
**Vapor Pressure:** 1.77 mm Hg at 1832 °F (1000 °C)
**Viscosity:** 3.2 cp at 621.3 °F (327.4 °C)
**Molecular Weight:** 207.20
**Specific Gravity (20 °C/4 °C):** 11.34
**Water Solubility:** Relatively insoluble in hot or cold water*

**Appearance and Odor:** Bluish-white, silvery, gray, very soft metal.

* Lead dissolves more easily at a low pH.

## Section 4. Fire and Explosion Data

| Flash Point: None reported | Autoignition Temperature: None reported | LEL: None reported | UEL: None reported |
|---|---|---|---|

**Extinguishing Media:** Use dry chemical, carbon dioxide, water spray, or foam to extinguish fire.
**Unusual Fire or Explosion Hazards:** Flammable and moderately explosive in the form of dust when exposed to heat or flame.
**Special Fire-fighting Procedures:** Isolate hazard area and deny entry. Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive-pressure mode and full protective equipment. Be aware of runoff from fire control methods. Do not release to sewers or waterways.

## Section 5. Reactivity Data

**Stability/Polymerization:** Lead is stable at room temperature in closed containers under normal storage and handling conditions. It tarnishes on exposure to air. Hazardous polymerization cannot occur.
**Chemical Incompatibilities:** Mixtures of hydrogen peroxide + trioxane explode on contact with lead. Lead is incompatible with sodium azide, zirconium, disodium acetylide, and oxidants. A violent reaction on ignition may occur with concentrated hydrogen peroxide, chlorine trifluoride, sodium acetylide (with powdered lead), ammonium nitrate (below 200 °C with powdered lead). Lead is attacked by pure water and weak organic acids in the presence of oxygen. Lead is resistant to tap water, hydrofluoric acid, brine, and solvents.
**Conditions to Avoid:** Rubber gloves containing lead may ignite in nitric acid.
**Hazardous Products of Decomposition:** Thermal oxidative decomposition of lead can produce highly toxic fumes of lead.

## Section 6. Health Hazard Data

**Carcinogenicity:** Although the NTP and OSHA do not list lead as a carcinogen, the IARC lists it as probably carcinogenic to humans, but having (usually) no human evidence. However, the literature reports instances of lead-induced neoplasms, both benign and malignant, of the kidney and other organs in laboratory rodents. Excessive exposure to lead has resulted in neurologic disorders in infants. Experimental studies show lead has reproductive and teratogenic effects in laboratory animals. Human male and female reproductive effects are also documented.
**Summary of Risks:** Lead is a potent, systemic poison that affect a variety of organ systems, including the nervous system, kidneys, reproductive system, blood formation, and gastrointestinal (GI) system . The most important way lead enters the body is through inhalation, but it can also be ingested when lead dust or unwashed hands contaminate food, drink, or cigarettes. Much of ingested lead passes through feces without absorption into the body. Adults may absorb only 5 to 15% of ingested lead; children may absorb a much larger fraction. Once in the body, lead enters the bloodstream and circulates to various organs. Lead concentrates and remains in bone for many years. The amount of lead the body stores increases as exposure continues, with possibly cumulative effects. Depending on the dose entering the body, lead can be deadly within several days or affect health after many years. Very high doses can cause brain damage (encephalopathy).
**Medical Conditions Aggravated by Exposure:** Lead may aggravate nervous system disorders (e.g., epilepsy, neuropathies), kidney diseases, high blood pressure (hypertension), infertility, and anemia. Lead-induced anemia and its effect on blood presssure can aggravate cardiovascular disease.

*Continue on next page*

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## Section 6. Health Hazard Data, *continued*

**Target Organs:** Blood, central and peripheral nervous systems, kidneys, and gastrointestinal (GI) tract.
**Primary Entry Routes:** Inhalation, ingestion.
**Acute Effects:** An acute, short-term dose of lead could cause acute encephalopathy with seizures, coma, and death. However, short-term exposures of this magnitude are rare. Reversible kidney damage can occur from acute exposure, as well as anemia.
**Chronic Effects:** Symptoms of chronic long-term overexposure include appetite loss, nausea, metallic taste in the mouth, lead line on gingival (gum) tissue, constipation, anxiety, anemia, pallor of the face and the eye grounds, excessive tiredness, weakness, insomnia, headache, nervous irritability, fine tremors, numbness, muscle and joint pain, and colic accompanied by severe abdominal pain. Paralysis of wrist and, less often, ankle extensor muscles may occur after years of increased lead absorption. Kidney disease may also result from chronic overexposure, but few, if any, symptoms appear until severe kidney damage has occurred. Reproductive damage is characterized by decreased sex drive, impotence, and sterility in men; and decreased fertility, abnormal menstrual cycles, and miscarriages in women. Unborn children may suffer neurologic damage or developmental problems due to excessive lead exposure in pregnant women. Lead poisoning's severest result is encephalopathy manifested by severe headache, convulsions, coma, delirium, and possibly death.
**FIRST AID**
**Eyes:** Gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately.
**Skin:** *Quickly* remove contaminated clothing. Rinse with flooding amounts of water for at least 15 min. Consult a physician if any health complaints develop
**Inhalation:** Remove exposed person to fresh air and support breathing as needed. Consult a physician.
**Ingestion:** Never give anything by mouth to an unconscious or convulsing person. If large amounts of lead were ingested, induce vomiting with Ipecac syrup. Consult a physician immediately.
**After first aid, get appropriate in-plant, paramedic, or community medical support.**
**Physician's Note:** For diagnosis, obtain blood pressure, blood lead level (PbB), zinc protoporphyrin (ZPP), complete blood count for microcytic anemia and basophilic stippling, urinalysis, and blood urea nitrogen (BUN) of creatinine. Examine peripheral motor neuropathy, pallor, and gingival lead line. Use Ca-EDTA to treat poison, but *never* chelate prophylactically. Consult an occupational physician or toxicologist.

## Section 7. Spill, Leak, and Disposal Procedures

**Spill/Leak:** Notify safety personnel and evacuate all unnecessary personnel immediately. Cleanup personnel should protect against inhalation of dusts or fume and contact with skin or eyes. Avoid creating dusty conditions. Water sprays may be used in large quantities to prevent the formation of dust. Cleanup methods such as vacuuming (with an appropriate filter) or wet mopping minimizes dust dispersion. Scoop the spilled material into closed containers for disposal or reclamation. Follow applicable OSHA regulations (29 CFR 1910.120).
**Disposal:** Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.
**EPA Designations**
Listed as a RCRA Hazardous Waste (40 CFR 261.33, Appendix II—EP Toxicity Test Procedures)
Listed as a CERCLA Hazardous Substance* (40 CFR 302.4), Reportable Quantity (RQ): 1 lb (0.454 kg) [* per Clean Water Act, Sec. 307(a)]
SARA Extremely Hazardous Substance (40 CFR 355): Not listed
Listed as a SARA Toxic Chemical (40 CFR 372.65)
**OSHA Designations**
Listed as an Air Contaminant (29 CFR 1910.1000, Table Z-1-A)

## Section 8. Special Protection Data

**Goggles:** Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133).
**Respirator:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a NIOSH-approved respirator. For emergency or nonroutine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.*
**Other:** Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact. Protective clothing made of man-made fibers and lacking turn-ups, pleats, or pockets retain less dust from lead.
**Ventilation:** Provide general and local ventilation systems to maintain airborne concentrations below the OSHA PELs (Sec. 2). Local exhaust ventilation is preferred since it prevents contaminant dispersion into the work area by controlling it at its source.[107]
**Safety Stations:** Make available in the work area emergency eyewash stations, safety/quick-drench showers, and washing facilities.
**Contaminated Equipment:** Never wear contact lenses in the work area: soft lenses may absorb, and all lenses concentrate, irritants. Remove this material from your shoes and equipment. Launder contaminated clothing before wearing.
**Comments:** Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially washing hands before eating, drinking, smoking, using the toilet, or applying cosmetics.

## Section 9. Special Precautions and Comments

**Storage Requirements:** Store in tightly closed containers in a cool, dry, well-ventilated area away from all incompatible materials, direct sunlight, and heat and ignition sources.
**Engineering Controls:** Educate worker about lead's hazards. Follow and inform employees of the lead standard (29 CFR 1910.1025). Avoid inhalation of lead dust and fumes and ingestion of lead. Use only with appropriate personal protective gear and adequate ventilation. Institute a respiratory protection program that includes regular training, maintenance, inspection, and evaluation. Avoid creating dusty conditions. Segregate and launder contaminated clothing. Take precautions to protect laundry personnel. Practice good personal hygiene and housekeeping procedures. For a variety of reasons, the lead concentration in workroom air may not correlate with the blood lead levels in individuals.
**Other Precautions:** Provide preplacement and periodic medical examinations which emphasize blood, nervous system, gastrointestinal tract, and kidneys, including a complete blood count and urinalysis. Receive a complete history including previous surgeries and hospitalization, allergies, smoking history, alcohol consumption, proprietary drug intake, and occupational and nonoccupational lead exposure. Maintain records for medical surveillance, airborne exposure monitoring, employee complaints, and physician's written opinions for at least 40 years or duration of employment plus 20 years. Measurement of blood lead level (PbB) and zinc protoporphyrin (ZPP) are useful indicators of your body's lead absorption level. Maintain worker PbBs at or below 40 µg/100 g of whole blood. To minimize adverse reproductive health effects to parents and developing fetus, maintain the PbBs of workers intending to have children below 30 µg/100 g. Elevated PbBs increase your risk of disease, and the longer you have elevated PbBs, the greater your chance of substantial permanent damage.

**Transportation Data (49 CFR 172.102)**
**IMO Shipping Name:** Lead compounds, soluble, n.o.s.
**IMO Hazard Class:** 6.1
**ID No.:** UN2291
**IMO Label:** St. Andrews Cross (X, Stow away from foodstuffs)
**IMDG Packaging Group:** III

*MSDS Collection* **References:** 26, 38, 73, 84, 85, 88, 89, 90, 100, 101, 103, 109, 124, 126, 132, 133, 134, 136, 138, 139, 142, 143
**Prepared by:** MJ Allison, BS; **Industrial Hygiene Review:** DJ Wilson, CIH; **Medical Review:** MJ Upfal, MD, MPH; **Edited by:** JR Stuart, MS



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July 6, 1994

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Remedial Project Manager
South Superfund Remedial Branch
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, NE
Atlanta, GA 30365

Subject: **Woolfolk Chemical Works Site**
**OU-1, Groundwater**
**June Progress Report**
**USEPA Docket No. 94-25-C**

Dear Mr. Woolheater:

Enclosed is the progress report for June 1994. I have enclosed the report submitted to you on June 13, 1994 to cover the first half of June. This will put us on a calendar month basis.

Very truly yours,

R. Sobel

Richard Sobel
Project Coordinator

cc: Doug Ammon
Jim Levine, Esq.
Alec Van Ryan
Al Vickers, Ph.D.

1199 North Fairfax Street, Suite 400
Phone (703) 683-8522 Alexandria, Virginia 22314 Fax (703) 548-8773

**WOOLFOLK CHEMICAL WORKS SITE**
**OU-1, Groundwater**
**Progress Report, June 14, 1994 to June 30, 1994**

## Activities in the Period

- By letter of June 28, 1994 USEPA issued a notice of authorization to proceed.
- We selected ERM Southeast to perform the design.
- A kickoff meeting was held on June 30, 1994 with ERM Southeast.
- Draft access agreement language was discussed with Sureco, Assembly of God Church, and Marion Allen.

## Activities Planned

- Work plans will be developed.

CLEAN SITES®

June 13, 1994

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Remedial Project Manager
South Superfund Remedial Branch
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, NE
Atlanta, GA 30365

Subject: **Woolfolk Chemical Works Site**
**OU-1, Groundwater**
**Progress Report, May 31 - June 13, 1994**
**USEPA Docket No. 94-25-C**

Dear Mr. Woolheater:

We submit herewith the progress report for subject period as called for by Appendix 2 of the UAO.

To confirm our phone discussion on June 10, 1994, future progress reports during periods of field activity will be twice per month as of the first and fifteenth. During design periods, monthly reports will be submitted. We believe this schedule makes sense and appreciate your attention to this matter.

Very truly yours,

R. Sobel

Richard Sobel
Project Coordinator

cc: Doug Ammon
Jim Levine, Esq.
Alec Van Ryan
Al Vickers, Ph.D.

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**WOOLFOLK CHEMICAL WORKS SITE**
**OU-1, Groundwater**
**Progress Report, May 31, 1994 to June 13, 1994**

## Activities in the Period

- By letter of June 6, 1994 Canadyne-Georgia Corporation (CGC) notified EPA IV of its intent to comply with the Unilateral Order.
- Requests for Proposals to do the design work were sent to bidders April 29, 1994. Bids were received May 24, 1994 and have been evaluated.
- We are in the final steps of selecting a design contractor.
- By letters of June 13, 1994, EPA IV was notified that Clean Sites, Inc./Douglas Ammon were proposed as the Supervising Contractor and that Richard Sobel of Clean Sites was proposed as the Project Coordinator.
- We have begun planning for access agreements.

## Activities Planned

- The selected contractor will start work preparing the work plan and other plans.

PROFESSIONAL PROFILE

ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

# D. Donald Deemer, P.E.

## Registration
Registered Professional Engineer in the states of California, Louisiana, Maryland, North Carolina, Pennsylvania, and Texas.

## Fields of Competence
Engineering and project management for industrial and municipal wastewater treatment, land application of wastewaters and residuals, industrial pretreatment, hazardous waste treatment and management, environmental assessments, and water quality management; project and facility planning; liaison and negotiations with regulatory agencies; permit preparation; and environmental compliance issues.

## Experience Summary
Ten years of experience as a corporate environmental engineer and manager with a major international food processing company. Responsibilities included engineering design, permit preparation, regulatory liaison, environmental audits, operating guidance, construction management, project development, and project management.

Over 15 years experience as engineer and project manager of environmental consulting services, including planning and feasibility studies, concept and detailed design, construction management, start-up and operations guidance, and regulatory liaison. Nationally recognized expert in land application of wastes. Qualified for expert witness testimony.

## Credentials
B.S., Sanitary Engineering, Pennsylvania State University, 1966
M.S., Sanitary Engineering, Pennsylvania State University, 1967
Completed quality education training as part of company-wide Total Quality Management (TQM) program

## Professional Affiliations
Water Pollution Control Federation
Water Pollution Control Association of Pennsylvania
Georgia Water Pollution Control Association
Chi Epsilon Civil Engineering Honor Society

## Technical Publications
Author of over 25 papers dealing with wastewater treatment.

## Key Projects
Project Manager for closure of RCRA-regulated Solid Waste Management Units at a wood treating facility. Activities included development of closure plan and design, preparation of post-closure permit application, development and implementation of a ground water quality assessment plan and a ground water remediation plan, and regulatory liaison.

Developed Remedial Action Plan for treating ground water contaminated by volatile organic compounds at a Superfund site.

Developed a plan for on-site bioremediation of contaminants at an abandoned wood treating site.

Designed expansions for a number of industrial wastewater treatment systems.

Under contract to EPA, evaluated numerous Innovative and Alternative (I/A) wastewater treatment technologies.

Speaker at numerous EPA, U.S. Army Corps of Engineers, and state-sponsored seminars on wastewater treatment.

Designer and/or Project Manager of over 15 currently operating land application systems, several of which have won state or industry sponsored awards for environmental achievement.

Retained as a qualified expert to evaluate the feasibility of several proposed land application systems.

Contributing author for EPA's 1981 Process Design Manual for Land Treatment of Municipal Wastewater and Principal author of EPA's 1984 Supplement to the same Process Design Manual.

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# Jack D. Riggenbach, P.E., DEE

## Registrations
Registered Professional Engineer in the states of Florida, Georgia, Alabama, Kentucky, Tennessee, and South Carolina.

## Fields of Competence
Remedial engineering; air pollution control; process engineering; hazardous waste management; hazardous waste incineration; construction management; conceptual and detailed design of solid waste, wastewater, and incineration facilities.

## Experience Summary
Twenty-one years of experience in the environmental engineering and construction field. Managed projects which included statewide and regional hazardous waste management plans, process and engineering design of activated carbon, air and steam stripping, solvent extraction, hazardous waste incineration, and physical/chemical wastewater treatment projects. Co-developed an in-situ stack monitor for particulate and gaseous fluorides. Directed engineering feasibility studies for hazardous waste incineration facilities. Director of air pollution group for a large environmental engineering firm. President of a general contracting firm in southeast Florida. Engineering design and permitting for RCRA storage, treatment, disposal, and incineration facilities. Feasibility studies and risk assessments for RCRA and CERCLA sites.

## Credentials
B.S., Chemical Engineering (honors), University of Florida, 1972
Hazardous Waste Incinerator Courses, 1978, 1982
Landfill Gas and Leachate Control, University of Wisconsin, 1985
Professional Fire Fighters Training, 10 weeks, 1968
Diplomate, American Academy of Environmental Engineers
40 Hour OSHA Certified

## Professional Affiliations
American Institute of Chemical Engineers
Water Environment Federation
American Academy of Environmental Engineers
Air and Waste Management Association

## Key Projects
Directed the engineering design for a 350-gpm air stripping system to remove PCE and TCE from ground water at a Superfund site in Florida.

Conducted the technical evaluation of an existing solvent incinerator with evaluations/recommendations for system upgrade. Part B permit application and trial burn plan.

Directed the third-party review of a site investigation at a municipal wellfield in Florida contaminated with PCE and TCE. Directed the engineering analysis of alternative cleanup methods at the same site. Expert witness.

Directed design of a biological soil treatment system for wood treating wastes.

Directed remedial design for landfill cap and leachate control at an EPA Superfund site in Florida. Design included development and implementation of an in-situ stabilization process for a light nonaqueous phase liquid.

Directed feasibility study for a Superfund site in Florida contaminated with lead/acid battery wastes.

Directed RCRA closure plan for metal plating sludge surface impoundment in Florida, including RCRA ground water monitoring system and risk assessment.

Process and detailed engineering design for recovery of 50,000 gallons of jet fuel from ground water.

Pilot plant studies and concept design for a 5 MGD granular activated carbon system in Brazil.

Directed CERCLA removal action at site with lead and arsenic contaminated wastes. Action included treatability evaluations, HRS scoring, chemical stabilization, and off-site disposal of stabilized waste and contaminated soils.

Managed closure of RCRA surface impoundment. Closure included drying 7,000 tons of sludge by a unique evaporative process, and removal of 16,000 tons of sludge and soil for off-site disposal. Rail transport was included.

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PROFESSIONAL PROFILE

ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

# Paul J. Usinowicz, Ph.D., P.E.

## Registration
Registered Professional Engineer in Pennsylvania

## Fields of Competence
Water and wastewater treatment
Hazardous and toxic wastes
Treatability assessment
Industrial waste management
Water chemistry
Biological wastewater treatment
Physical and chemical water and wastewater treatment
Operations troubleshooting
Training

## Experience Summary
More than twenty years of diverse environmental engineering experience. Nine years of university teaching, research, and consulting specializing in water and wastewater treatability and water quality issues. Nine years with chemical industry defining waste handling and disposal technologies for meeting environmental regulations, including toxic and listed RCRA hazardous wastes. Experience also includes site assessment, ground water contamination and remediation, wastewater toxicity reduction, waste elimination and minimization, operations training and troubleshooting, wastewater treatability assessment and design, ambient air monitoring, treatment systems monitoring, and aquatic bioassay assessments.

## Credentials
Ph.D., Civil (Environmental) Engineering, University of Michigan, 1972
M.S., Civil (Environmental) Engineering, University of Iowa, 1969
B.S., Civil Engineering, University of Iowa, 1968

## Professional Affiliation
National Society of Professional Engineers
Pennsylvania Society of Professional Engineers
Water Environment Federation
Water Pollution Control Association of Pennsylvania

## Key Projects
Developed and implemented stable zinc removal process for galvanizing wastewaters by source control, waste minimization practices, and use of a dense sludge process.

Developed conceptual design for activated carbon treatment of highly acidic, listed hazardous wastewater from DNT manufacturer. Defined chromatographic separation effects on minor components and design and operations control requirements.

Developed requirements for treating emulsions wastewaters. Demonstrated need for pretreatment prior to activated sludge biotreatment for effluent compliance.

Performed site assessment for chemical plant acquisition. Identified contamination liabilities that resulted in exclusion of real estate and indemnification for site purchaser.

Tested and developed rating curves for roter aerators.

Demonstrated biotreatability and developed treatment methods for many chemical wastes including nitrations red water (DNT), aminations (aliphatic and aromatic amines), and other processes. Determined loading limitations for existing waste treatment systems and design of new systems.

Developed and executed ambient air monitoring programs for hazardous and carcinogenic organic chemicals.



(CONTINUED OVER)

PROFESSIONAL PROFILE

ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

# V.W. (Chuck) Boyett, P.E.

## Registrations

Registered Professional Engineer in Tennessee, Alabama and Ohio
Registered Land Surveyor in Tennessee

## Fields of Competence

Civil and environmental engineering design and project management. Project cost estimating, field engineering, planning and scheduling of projects related to buildings, sewage treatment facilities, highways and roads, airports, and electrical transmission and distribution facilities. Site grading and drainage design for storm drainage control, site selection studies for various structures and facilities including preliminary designs and cost estimates. Environmental compliance monitoring and reporting for NPDES permits, hazardous waste management and disposal and air pollution permitting and reporting to regulatory agencies. UST's, EAP, CAP, site remediation systems design and installation. Remedial investigations and feasibility studies for RCRA/CERCLA sites. Management and development of maintenance control systems and material control systems for large commercial facilities including preventive and predictive maintenance systems for electrical, mechanical, HVAC, mobile equipment and grounds maintenance requirements.

## Experience Summary

Twenty years experience in civil engineering and environmental engineering design and construction management. Heavily involved in project development and preliminary designs and estimating for budgeting and capital appropriations. Developed designs and technical specifications for construction of new facilities and renovations to existing facilities particularly in the civil/structural and environmental engineering related areas. Performed topographic, boundary and construction surveys, design and project layouts.

## Credentials

B.E., Civil Engineering, Vanderbilt University, 1972 Graduate work toward M.S., Engineering Administration, University of Tennessee, Nashville 1977-1978

## Professional Affiliations

National Society for Professional Engineers
American Society for Civil Engineers
Tennessee Association of Professional Surveyors

## Key Projects

Construction coordination and maintenance systems planning and start-up for a new $200,000,000 airport terminal facility in Tennessee.

Project design engineer and construction manager for a 1 mgd ionic exchange process water reclamation project in the aerospace industry.

Project Engineer and Project Coordinator for a comprehensive Waste Management Program at a large organic chemical manufacturing facility which included waste stream characterization, waste minimization, engineering treatment evaluations and computer software systems for effluent management.

Project Engineer for site investigations, Environmental Assessment Plans, Corrective Plans, Site Remediation system design and installation for a large underground petroleum release at a major air carrier airport facility.

Project manager and chief design engineer for a new general aviation airport facility in Tennessee

Project design engineer and construction administration for a new 7 mgd two stage biological sewage treatment facility and collection systems.

Preliminary and final engineering design and construction administration for a 2 mgd primary solids removal and dewatering project at a large paper mill facility in Ohio.

Project engineer and coordinator for a 70 site-statewide general aviation UST systems management plan and cost estimate for the Tennessee Department of Transportation.

Air permitting, compliance and reporting responsibilities for large aerospace industrial facility with 25 permits and point source discharges including engineering evaluations and design work to retro fit existing equipment for VOC incineration and removal.

Engineering management and inspection services and overall contract administration for a $1,000,000 asbestos abatement and building demolition project.

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PROFESSIONAL PROFILE

ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

# Jeffrey N. Bilkert, CPSS

## Registration
Certified Professional Soil Scientist (CPSS)

## Fields of Competence
Development, implementation, and management of hydrogeologic investigations associated with ground water and soils remediation at hazardous waste sites, underground storage tank sites, and non-hazardous waste sites. Site evaluation studies of proposed and existing land treatment systems. Environmental audits of industrial facilities and other properties for real estate transactions. Client liaison with legal counsel and regulatory agencies.

## Experience Summary
Twelve years of experience with universities and environmental consulting firms. Extensive experience evaluating soils contamination, ground water contamination, and remedial alternatives at a variety of industrial and underground storage tank sites. Hydrogeologic responsibilities include design and supervision of drilling programs, design and installation of monitoring well networks, implementation of ground water sampling programs, and conducting aquifer testing programs. Qualified for expert witness testimony.

Conducted soils and hydrogeologic evaluations of more than 20 proposed or existing land treatment systems. Responsible for selection of design loading rates, delineation of suitable application areas, and recommendations concerning system monitoring.

Conducted environmental audits at numerous industrial facilities and undeveloped properties for real estate transactions.

Conducted comprehensive soil surveys of two Minnesota counties. Field experience included extensive work with organic soils. Conducted laboratory and field experiments to characterize the sorption and transport characteristics of selected pesticides in soils.

## Credentials
B.S., Soil Science, Ohio State University, 1978
M.S., Soil Physics, University of Florida, 1984

## Key Projects
Conducted a comprehensive investigation to evaluate aquifer characteristics and extent of ground water contamination as part of the closure of wastewater storage ponds at a wood treating facility.

Design, installation, and operations management of ground water recovery and treatment system at wood treating site.

Evaluated waste volumes and lead contamination of soils and ground water at a foundry sand disposal site.

Managed environmental audits of roller manufacturing facilities throughout the United States.

Conducted soils and hydrogeologic evaluations at proposed and existing land treatment sites throughout the United States.

Conducted hydrogeologic investigations at a textile facility as part of due diligence efforts associated with the sale of the facility.

Design, installation and operations management of ground water remediation system at underground storage tank site.

Directed remediation of VOC contaminated soils by excavation and aeration.

Environmental audits of glass making, precious metals refining, and other industrial facilities.

Permitting of indirect discharge from ground water recovery system to municipal sewer system.

Oversight of removal and off-site disposal of pentachlorophenol-contaminated soils from a forest products facility.

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PROFESSIONAL PROFILE

ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

# Sam B. Upchurch, Ph.D., P.G.

## Registration

Licensed Professional Geologist in Florida
Certified Professional Geologist, American Institute of Professional Geologists (AIPG)
Professional Hydrogeologist, American Institute of Hydrology

## Fields of Competence

Ground water geochemistry, including natural and contaminated systems; statistical analysis and properties of environmental data; physical hydrogeology, including flow modeling; transport of contaminants in water; transport of radioactive isotopes in surface and aquifer environments; karst hydrology and geomorphology; origin, engineering properties, and prediction of sinkholes; relation of dissolved and particulate organics to metals transport in aquifers, lakes, and estuarine environments.

## Experience Summary

Thirty years of experience as a consultant, professor, and research scientist, including positions with the Tennessee Bureau of Geology, Corps of Engineers, National Oceanic and Atmospheric Administration, Michigan State University, University of South Florida, and ERM.

Author of over 100 papers in books, professional journals, and before professional societies. Technical consultant for the Florida Groundwater Monitoring Program.

## Credentials

Ph.D., Geology, Northwestern University, 1970
M.S., Geology, Northwestern University, 1966
A.B., Geology/Chemistry, Vanderbilt University, 1963

## Professional Affiliations

Society of Economic Paleontologists and Mineraloligsts
International Association for Mathematical Geology
Association of Ground Water Scientists and Engineers
American Association of Petroleum Geologists
American Institute of Professional Geologists
Geological Society of America
American Institute of Hydrology
American Water Resources Association
Southeastern Geological Society

## Key Projects

Analysis of cores taken as part of the ROMP Project for Southwest Florida Water Management District

Chemical characteristics of ground water and aquifer interactions, Lee County, Florida for South Florida Water Management District

Ground water chemical modeling, Manatee County Recharge/Recovery Project

Expert witness on hydrology and radiation at proposed phosphate mines for Manatee, Hardee, and DeSoto counties in Florida

Origin and transport of chemical constituents in the ground waters of the Hawthorn Formation, Kingsford Mine area for International Minerals and Chemical Corporation

Source of gross alpha radioactivity anomalies in recharge wells for Florida Institute for Phosphate Research/Southwest Florida Water Management District

Evaluation of the Florida Ambient Ground Water Quality Program for Florida Department of Environmental Regulation

Data Analysis, Ambient Ground Water Quality Program for Suwannee River Water Management District and Alachua County, Florida

State-wide evaluation of ground water quality for the Florida Department of Environmental Protection

Analysis of temporal variability of water quality in Florida's aquifers, Florida Department of Environmental Protection

Expert witness on Class I injection wells, southeast Florida, confidential client



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A MEMBER OF THE ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

# Diane Drew

## Registration
Registered Professional Nurse
Certified Mediator

## Fields of Competence
Public and occupational health
Facility assessment
Regulatory affairs management
Permit and report preparation
Regulatory agency liaison
Environmental and regulatory compliance assessment
Emergency response planning and compliance training
Hazardous and infectious waste management
Community and media relations

## Experience Summary
Over 10 years experience in public health and occupational health and safety; responsibilities included employee training, quality assurance and maintenance of standards of care, staff development programs. Several years experience in environmental policy assessment, including impact evaluation of proposed and enacted legislation. Experience in preparation of compliance programs and manuals for emergency response planning; RCRA, OSHA, and CWA emergency response and hazard communication training; worker health and safety assessment; and MSDS review and utilization for program development. Project manager in varied industrial settings with responsibility for coordination of consulting services for facilities in meeting federal, state, and local regulatory standards.

## Credentials
R.N.; Cook County School of Nursing; Chicago, Illinois; 1964
B.S.; Indiana University; Bloomington, Indiana; 1986
M.P.A.; Indiana University; Bloomington, Indiana; 1988
Completed quality education training as part of company-wide Total Quality Management (TQM) program

## Key Projects
As project manager, developed comprehensive emergency response preparedness strategy for manufacturing facility including process assessment, manual and document preparation, workforce training, media and agency communications plan, and notification and compliance protocols.

Developed and conducted OSHA and RCRA training; reviewed regulatory applicability; determined availability of emergency responders, resources, and contacts for facilities in emergency response planning and preparation.

Prepared OSHA 1910.120, OSHA 1910.1200, and RCRA Emergency Response training manuals for industrial clients.

Assisted with development of audio-visual and written materials for health care provider and occupational health and safety training programs.

Served as public health interagency and community liaison in interpretation and implementation of public health policy and regulatory standards.

Conducted field inventory and assessment of extensive underground storage tank farm for major industrial client.

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PROFESSIONAL PROFILE

ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

# Catherine C. Warner, P.E.

## Registration
Professional Engineer in Pennsylvania

## Fields of Competence
Site engineering, water and wastewater treatment plant and distribution system planning, solid waste management, engineering design and construction management.

## Experience Summary
Diversified experience in the environmental field as a consulting engineer in a design firm. Experience includes engineering design services, construction phase services, technical evaluation of projects, and feasibility studies.

## Credentials
B.A., Civil Engineering, Lafayette College, 1982
M.E., Environmental Engineering, Louisiana University, 1984

## Professional Affiliation
National Society of Professional Engineers
American Society of Civil Engineers

## Publications
Feasibility of Harvesting Algae with a Fine Sand Filter, Master's Thesis, Louisiana State University, 1984

## Key Projects
Project engineer responsible for the design of the recovery and treatment system for ground water contaminated with gasoline. The system included collecting 800 gpm of water from seven wells, pH adjustment, two counter-current packed-tower air stripping columns in series, carbon adsorption, and ground water recharge via infiltration basin. Project also included free phase recovery of gasoline from five wells. Responsibilities included design, construction phase services, start-up and operating and maintenance manual.

Project manager responsible for design phase during a corporate-wide tank replacement program. Project involved design of state-of-the-art underground storage tank systems to store fuel oil and hazardous waste.

Project engineer responsible for the design phase of a hazardous waste site remediation including remediating 1.5-acre lagoon capping and ground water treatment using packed-tower counter-current air stripping of 170 gpm.

Industrial process water remediation design for a 450-gpm well contaminated with volatile organics. Selected treatment alternative was packed-tower counter-current air stripping.

PROFESSIONAL PROFILE

ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

# Deborah M. Watkins, P.E.

## Registration
Registered Professional Engineer in Pennsylvania, Virginia, and Maryland

## Fields of Competence
Treatability studies
Design of water treatment systems
Design of industrial wastewater treatment systems
Design of municipal wastewater treatment systems
Design of ground water treatment systems
Design of air emission control systems
Air emissions studies
Air permit applications
Treatment works approval applications
NJPDES permits
Spill plans (SPCC, DPCC/DCR, PPC)
Stormwater pollution prevention plans
Site remediation feasibility studies
Litigation support

## Experience Summary
Eleven years of experience in environmental engineering involving project engineering and management responsibilities for the following types of projects: treatability studies, water and wastewater treatment system design, air emission control system design, permitting, preparation of spill plans, preparation of stormwater pollution prevention plans, and site remediation feasibility studies.

## Credentials
B.S., Chemical Engineering, Bucknell University, 1982
M.S., Environmental Engineering, Villanova University, 1989

## Professional Affiliations
American Institute of Chemical Engineers

## Key Projects
Conducted treatability studies and designed a wastewater treatment system including chromium reduction, chemical precipitation, clarification, filtration, sludge dewatering, and sludge drying operations for a metal plater in New Jersey.

Designed a reverse osmosis system for the treatment of plant makeup water for a metal plater in New Jersey.

Designed an ion exchange system for treatment and recycling of a chromium-containing rinsewater for a metal plater in New Jersey.

Conducted treatability studies and designed a wastewater pretreatment system including chromium reduction, chemical precipitation, clarification, filtration, and sludge dewatering operations for a metal plater in Pennsylvania.

Conducted treatability studies and designed an ultrafiltration/reverse osmosis system for a precious metals manufacturer in New Jersey.

Designed an odor control facility including an ammonia adsorption scrubber, hydrogen sulfide adsorption scrubber, mercaptan oxidation scrubber, and scrubber purge water treatment system for a foam manufacturer in Pennsylvania.

Designed a leachate treatment system including metals precipitation, biological treatment, granular activated carbon adsorption, filtration, clarification, and sludge dewatering operations for a municipal landfill in Pennsylvania.



(CONTINUED OVER)

# Dawson W. Gilmore, P.E.

## Registration
Registered Professional Engineer in states of Georgia and Mississippi.

## Fields of Competence
Project management and design for various civil, structural, and environmental engineering projects. Involvement in all phases of project development including planning, scheduling, cost estimating, design (both conceptual and final), client contact, specifications, field investigation, and construction inspection. Areas of environmental expertise include ground water remediation (pump and treat), remediation of soils by soil vapor extraction, removal and installation of underground storage tanks (USTs) containing hazardous substances and petroleum products, preparation of SPCC and oil spill response plans. Involved with preparation of drawings and documents for sanitary landfill design, closure plans for landfills, and liner systems for containment areas. Other areas of expertise include site development, buildings, industrial facilities, grading, drainage, detention facilities, sediment and erosion control, roadway and parking facilities, evaluation of existing structures for compliance with building codes, permitting for development and construction through county and state municipalities, and foundation and building design involving reinforced concrete and structural steel.

## Experience Summary
Sixteen years experience in civil, structural, and environmental engineering. Duties have included development of projects from conceptual design through final design and construction including written proposals, cost estimates, budgetary control, and assignments maintaining close client contact during design. Development of complete set of design drawings including specifications and bid package. Preparation of reports and documents including engineering feasibility studies, spill prevention and contingency plans, closure and post-closure plans, and compliance assessments for USTs and above ground storage tanks (ASTs). Involved with many aspects of several construction projects including construction management, investigation, and technical advisor. Obtained field data at construction sites including topography and survey of the area. Construction surveyor responsible for proper layout and grade during construction of buildings and roads.

## Credentials
B.E., Civil Engineering, Georgia Institute of Technology, 1973.

## Key Projects
Design of ground water remediation system involving ground water recovery and treatment for several southeastern industries.

Preparation of documents for closure of existing hazardous substance USTs, sampling activities, closure report, and design of new UST system for major chemical industry.

Preparation of documents for removal and closure of five USTs for industry in Georgia.

Design of soil vapor extraction system for two industries in Georgia.

Preparation of closure post-closure plans for landfill, including revisions and resubmittal to state for industry in Kentucky.

Preparation of several SPCC plans, as well as spill contingency plans and oil spill response plans for industries in Georgia, Alabama, and Tennessee.

Design of pump stations, wet wells, and associated equipment for wastewater treatment plants.

Design for titanium containment area in New Jersey.

Study of existing solvent tank storage system not in compliance with regulations and design of a new system at Hunter Army Airfield, Savannah, Georgia.

Assessment of hazardous waste storage tank system of steel mill for compliance with federal and state regulations in Atlanta, Georgia.

Preliminary design for closure of two aeration ponds including leachate drainage layer, geomembrane, geotextile, gas venting, clay cover and erosion control for industry in South Carolina.

ERM

PROFESSIONAL PROFILE

ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

# Michael R. Meulemans, P.E.

## Registrations
Professional Engineer in Tennessee, Ohio and Delaware.

## Fields of Competence
Design and project management for varied civil and environmental engineering projects. All aspects of project development, including proposals, budget preparation, schedule development, personnel requirements, client management, plans preparation, specifications, and construction and field inspection. Preparation of preliminary concept development packages and final construction documents, including cost estimates and time requirements, in areas such as wastewater treatment, highway engineering, utility systems, stormwater management programs, grading and drainage, earthwork, detention systems, sedimentation and erosion control. Familiar with various computers and software, including CAD systems, US Corps of Engineers HEC-1 and HEC-2, US Federal Highway Administration software, and other design-oriented software, as well as specific programs developed for in-house use. Development of compliance documents for hazardous waste treatment/storage/disposal facilities. Evaluation of existing facilities for regulatory compliance.

## Experience Summary
Eleven years experience in civil and environmental engineering, both in government and as a consultant. Administered water fluoridation program for Tennessee Department of Health and Environment. Involved in project development and preliminary design and cost estimates for a significant number of development projects. Responsible for producing bid and construction documents for many new and existing facilities, including medical facilities in nine states, single- and multifamily residential developments and commercial and industrial developments. Implemented two different CAD systems into the operations of consulting firms. Prepared reports and documents such as traffic impact studies, environmental assessments, asbestos abatement plans and specifications, and closure and post-closure plans, and permit applications.

## Credentials
M.S. Engineering Management, University of Tennessee, 1988.
B.E. Civil Engineering, Vanderbilt University, 1980.

## Professional Affiliations
American Society of Civil Engineers
National Society of Professional Engineers

## Key Projects
Evaluation of subsurface contamination at abandoned munitions factory.

Design of innovative on-site wastewater treatment facility for community hospital in East Tennessee.

Development of computer-based evaluation methods for landfill siting study for major metropolitan area.

Site design for various projects including a county jail, hospitals and medical facilities, a nature center, and a state park.

Rapid plans development for military exercise at Ft. Campbell, Kentucky.

Design of 2-MGD wastewater treatment system for pulp and paper facility in Ohio, including +0%/-10% cost estimate generated for use by the client.

Cleanup of mercury-contaminated dwellings near major industrial facility in East Tennessee.

Managed closure and post-closure plans for RCRA hazardous waste landfill; included a clay cap with integral drain layer, slope stability analyses, hydrologic modeling of cap performance, and a construction quality assurance plan; developed detailed design and specifications.

Owner's representative for asbestos abatement project at major metropolitan airport terminal.

Part B Permit application for hazardous waste facilities at Ft. Campbell, Kentucky.

ERM

# Rodney Stafford

## Fields of Competence

Pesticide Analytical Methodology; Analytical Toxicology (Mammalian and Aquatic); Gas and Liquid Chromatography; Environmental Auditing; RCRA, FIFRA Regulatory Interpretation; Quality Assurance Plans; Surface Water, Ground Water, and Soil Sampling/Analysis.

## Experience Summary

Two years as a staff environmental scientist for an industrial corporation. Responsibilities included interpretation and QA/QC review of analytical data for regulatory compliance and definement of extent of contamination at hazardous waste sites, including PCB and volatile organics cleanup projects. Experience in profiling graphical soil and ground water contamination, including subsurface modeling and fate transport of pollutants at RCRA sites. Additional responsibilities included management of work flow for field and laboratory personnel, administering technical training for regulatory compliance, and assisting in permit application and renewal.

Employed in both agricultural and aquatic toxicity laboratories for seven years, developed numerous analytical validation studies of toxicological compounds in a wide variety of matrices (fruits, cereal crops, soil, water, tissues, etc.). Extensive experience with analytical methodologies of regulated and experimental pesticides, insecticides and fungicides for various international clients, including DuPont, Dow Chemical, Monsanto, Ciba-Geigy, and Hoechst Roussel. Experience with FIFRA regulation.

## Credentials

B.S. Biochemistry, Pennsylvania State University, 1989
Graduate course work in Civil (Environmental) Engineering, Florida Atlantic University, 1991, 1992
Completed quality education training as part of company-wide Total Quality Management (TQM) program
Seminar in Ground Water Modeling; Using Microcomputers to Solve Ground Water Problems, University of Florida, 1992

## Key Projects

Retained by a major U.S. defense contractor as the Quality Assurance Officer for a RCRA Facility Investigation consisting of 91 Solid Waste Management Units (SWMUs).

Designed and built the analytical laboratory for a company engaged in marine/freshwater toxicity testing for experimental product evaluation under FIFRA regulations.

Managed a project for EPA Closure Notification (CFR Part 262) of 126 <90-day hazardous waste storage location.

Conducted a statistical surface water barium study at an industrial site canal system to obtain a variance from NPDES sample requirements.

Authored a Reuse Feasibility Study for a private wastewater treatment facility.

Augmented a derivitization procedure for the GC analysis of ethylene thiourea in high sulfur-content matrices.

Assisted in method validation of 4- and 5-hydroxy- metabolites of Benlate in chicken tissues; performed residue analysis in a study of 92 chickens to determine metabolic fate.

Implemented a quality assurance project plan (QAPjP) for a PCB and petroleum contamination assessment of soil, sediment, surface, and ground water at an industrial site.

Performed isopleth contouring and modeling of heavy metals and hazardous constituents for a pair of percolation ponds which had received wastes from plating operations.

ERM

PROFESSIONAL PROFILE

# Kevin K. Gantz, P.G.

## Registration
Registered Professional Geologist: Georgia, South Carolina

## Fields of Competence
Hydrogeological Site Investigations
Environmental Assessments
SARA Tier II and Form R Reporting
Soil and Ground Water Testing
Personnel Sampling for Airborne Contaminants

## Experience Summary
Over eight years experience in environmental compliance consulting. Experienced in environmental assessment with a firm grasp of the regulations and the requirements necessary to achieve compliance. Management background includes supervision of hydrogeologic site investigations, management of multi-property environmental assessments, and project coordination of SARA and RCRA report filing.

Worked as an air monitoring and testing team member for both outdoor and indoor air quality. Has worked with manufacturing employees to do quarterly OSHA employee exposure monitoring.

## Credentials
B.S. in Geology, University of Georgia, 1984
OSHA 40-Hour Hazardous Materials Training
Certified Environmental Auditor, National Registry of Environmental Professionals
Completed quality education training as part of company-wide Total Quality Management (TQM) program.

## Professional Affiliates
The Geological Society of America

## Continuing Education
The National Institute for Storage Tank Management, 4th Annual Georgia State Conference, November 1993
Seminar speaker on UST program management
Region IV Environmental Regulation Courses, Executive Enterprises, Inc., 1993, 1994

## Key Projects
Responsible for preliminary hydrogeological site evaluation, monitor well location, field supervision of drilling crews, well logging and installation, and collecting environmental and geotechnical samples for analysis at several remedial investigation sites throughout the southeast.

Experienced in ambient air monitoring and personnel sampling for airborne contaminants following EPA quality control procedures.

Provided client support in RCRA and SARA permit applications, questionnaires, and annual reports. Project coordinator for SARA Tier II reporting for an industrial client with 112 facilities in fifteen states:

Provided field investigations, data development and research, and final environmental evaluation on over 100 commercial and industrial Phase I Environmental Audits.

Experienced in developing cost effective Phase II Environmental Investigations and performing necessary testing.

Thoroughly knowledgeable about regulations governing underground storage tanks, and asbestos-containing building materials

Project coordination for environmental assessment of 52 properties in 6 states totalling 90,000 acres.

ERM

# Stephen V. Johnson, P.G.

## Registrations
Registered professional geologist in Georgia (910), North Carolina (1252), South Carolina (1074), and Tennessee (TN1929).

## Fields of Competence
Project management; RI/FS investigations in EPA Region IV; contamination assessments at facilities with aboveground and underground storage tanks throughout the Southeast; monitoring well and recovery well design and installation; soil, sediment, surface water, and ground water sample collection; aquifer testing.

## Experience Summary
Nine years of environmental project experience with state agencies and environmental consulting firms investigating and remediating soil and ground water contamination at hazardous and non-hazardous waste sites. Contamination assessment experience includes project planning, supervising monitoring well/recovery well design and installation, aquifer testing, soil and ground water sampling, and report preparation.

## Credentials
B.S. Geology and Geophysics, University of Wisconsin, 1983
M.S. Geology, University of Alabama, 1989
EPA Region IV Contractor Overview and SOP Course - Hazardous Waste Section
Completed quality education training as part of company-wide Total Quality Management (TQM) program.

## Professional Affiliation
National Ground Water Association

## Key Projects
Monitoring well installation and water supply well abandonment at Superfund sites in South Carolina.

Soil boring and monitoring well installation; soil and ground water sampling at several former landfills and ordinance disposal areas at military installations in EPA Region IV.

Contamination assessments at several underground storage tank sites throughout the Southeast.

Contamination assessments and oversight for underground storage tank closures at several sites throughout the Southeast for a major package distribution company.

Retrofitting underground storage tanks at several facilities in Florida to bring into regulatory compliance.

Phase I and Phase II environmental audits for property transfers throughout the Southeast.

Water supply well installation and aquifer testing at a municipal well field in South Central Florida.

Aquifer testing of water supply wells for a major produce grower in South Central Florida.

Monitoring well installation; soil, sediment and ground water sample collection; aquifer testing at Superfund sites in South Florida.

ERM

PROFESSIONAL PROFILE

ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

# George P. Puvvada, P.G.

## Registration
Registered Professional Geologist, Tennessee
Certified Ground Water and Soil Sampler, Utah

## Fields of Competence
Geological and hydrogeological site characterization; design, implementation, and management of ground water monitoring programs and soils remediation at hazardous non-hazardous, and underground storage tank sites; development and implementation of ground water quality investigations; analytical modeling of ground water flow and contaminant transport; design and installation of recovery systems for non-aqueous phase liquids; environmental audits of industrial facilities for regulatory compliance; and performance of aquifer tests.

## Experience Summary
Over three years experience with universities as a Teaching and Research Assistant. Responsibilities included teaching different labs to undergraduate students of geology. Performed geological research work for and with various professors.

Responsibilities as the on-site geologist for a mining company including design of deep-rock borings, supervision of drilling, logging and sampling of drill cuttings and development of a wholistic picture of the site for possible mining by integrating the available, collected, and projected data.

Operated various computer software packages to draw graphical illustrations and to present technical data.

Environmental consulting experience including hydrogeological responsibilities such as designing and supervision of drilling programs, developing shallow and deep soil sampling networks, layout and installation of ground water monitoring well networks, and conducting ground water sampling programs. Managed product recovery at UST facilities, developed ground water monitoring programs, performed aquifer tests, operated soil vapor recovery systems, collected soil gas samples, and operated gas chromatograph to analyze them.

## Credentials
Course Work of Advanced Certificate in Hydrogeology, Georgia State University.
M.S. Geology, Brigham Young University, 1991
M.Sc. Geology, Gulbarga University, 1988
B.Sc. Mineral Processing, Andhra University, 1985

## Key Projects
Supervised mud-rotary drilling, installation and sampling of deep (+300') ground water monitoring wells at a Superfund site in Tennessee.

Conducted several Phase I site assessments for a telecommunications company.

Collected soil samples and vapor samples from an existing UST facility and analyzed them by using a portable GC.

Supervised drilling operations and installed ground water monitoring wells at numerous UST facilities.

Operated, dewatered, and collected soil-vapor samples from soil-vapor extraction systems at various UST facilities.

Conducted soil sampling at tank closure sites and wood processing plants.

Conducted free-product removal activities from ground water monitoring wells at several UST facilities.

## Technical Publications
Author of two papers dealing with paleostress orientations of microfractures and crystal chemistry of a rare amphibole.

## Professional Affiliations
National Water Well Association
Geological Society of America
International Association of Hydrogeologists

ERM

BLACK & VEATCH Waste Science, Inc.

400 Northridge Road, Suite 350, Atlanta, Georgia 30350, (404) 594-2500, Fax: (404) 587-2930

JUN 23 1994

US EPA -- Region IV
Site Inspections
Work Assignment No. 12

BVWS Project 52012.429
June 22, 1994

6/28/1994

Mr. Narindar Kumar
Chief, Site Assessment Section
U.S. Environmental Protection Agency
345 Courtland Street, NE
Atlanta, Georgia 30365

Subject: Site Inspection Prioritization
Woolfolk Chemical
Lenox, Cook County, GA
EPA ID No. GAD082832841

Dear Mr. Kumar:

Enclosed please find one copy of the ~~Draft~~ Site Inspection Prioritization for Woolfolk Chemical in Lenox, Cook County, Georgia. If you have any questions, please contact me at 404/643-2320.

Very truly yours,

BLACK & VEATCH Waste Science, Inc.

Victor Blix
Project Manager

sf
Enclosure

cc: Doug Thompson, EPA PO, w/o enclosures
Deborah Davidson, EPA CO, w/o enclosures
Earl Bozeman, EPA WAM, w/o enclosures

BLACK & VEATCH Waste Science, Inc.

2300 Clayton Road, Suite 220, Concord, California 94520-2100, (510) 246-8010, Fax: (510) 246-8082

U.S. Environmental Protection Agency
Woolfolk Chemical - Lenox Warehouse
Work Assignment 12

BVWS Project 52012.429
BVWS File SA
June 9, 1994

Mr. Narindar Kumar
Chief, Site Assessment Section
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

NARoP
6/21/1994

Subject: Site Inspection Prioritization
Woolfolk Chemical
Lenox, Cook County, Georgia
EPA ID No. GAD~~0~~982832841

Dear Mr. Kumar:

BLACK & VEATCH Waste Science, Inc. has been tasked by the U.S. Environmental Protection Agency (EPA), to conduct a Site Inspection Prioritization at the Woolfolk Chemicals - Lenox Warehouse (Woolfolk) Site in Lenox, Georgia. According to the Scope of Work, a preliminary Hazard Ranking System (HRS) score was prepared to determine future activities at the site.

The Woolfolk site is located on a 1 1/2 acre tract of land situated at the intersection of Rentz Avenue and East Colquitt Street in the city of Lenox, Georgia. The site is currently owned by Mr. Bob Lindsey. From 1976 to 1981, Woolfolk Chemical leased the warehouse from Mr. Lindsey, and used the facility as a distribution and storage center for a wide variety of herbicide and pesticide products (Ref. 1).

On July 1, 1981, a fire gutted the facility. Water used to fight the fire became contaminated when toxaphene and chlordane stored inside the warehouse began to leak. The contaminated water was observed spilling onto the surrounding soil and into a municipal drainage ditch located approximately 30 feet to the south of the warehouse. On July 31, 1981, approximately 200 cubic yards of residual

BLACK & VEATCH Waste Science, Inc.

2300 Clayton Road, Suite 220, Concord, California 94520-2100, (510) 246-8010, Fax: (510) 246-8082

U.S. Environmental Protection Agency
Woolfolk Chemical - Lenox Warehouse
Work Assignment 12

BVWS Project 52012.429
BVWS File SA
June 9, 1994

Mr. Narindar Kumar
Chief, Site Assessment Section
U.S. Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

NKRoP
6/21/1994

Subject: Site Inspection Prioritization
Woolfolk Chemical
Lenox, Cook County, Georgia
EPA ID No. GAD~~0~~82832841
0

Dear Mr. Kumar:

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On July 1, 1981, a fire gutted the facility. Water used to fight the fire became contaminated when toxaphene and chlordane stored inside the warehouse began to leak. The contaminated water was observed spilling onto the surrounding soil and into a municipal drainage ditch located approximately 30 feet to the south of the warehouse. On July 31, 1981, approximately 200 cubic yards of residual

hazardous waste diposal facility. In addition, firefighting waters that remained in the warehouse were treated with activated carbon to remove excessive amounts of toxaphene (Ref. 1).

In March 1985, Mr. Lindsey reported to EPA Region IV that a strong odor existed in the building and requested EPA personnel to investigate (Ref. 2). On August 8, 1984, members of the Georgia Environmental Protection Division (GEPD) Remedial Action Unit collected surface soil samples from the front and rear entrances of the warehouse. An additional sample was collected from a crack in the floor of the building where pesticide residue had accumulated. Analysis of the samples revealed high levels of toxaphene in the soil (up to 6,062 milligrams per kilogram) (Ref. 1). A Site Investigation Report was completed by the Georgia Environmental Protection Division (GEPD) in February, 1985 (Ref. 1). The report recommended further assessment of the site in order to evaluate the migration potential of onsite contaminants (Ref. 1). To date, no remedial action has been taken to remove excess toxaphene from the soil surrounding the warehouse or the drainage ditch (Refs. 1, 2).

A preliminary HRS score for the Woolfolk site was calculated using the Site Inspection worksheets. Pathways evaluated include groundwater, surface water, soil exposure, and air.

The groundwater pathway score is based on a potential release from contaminated soil. The groundwater pathway score is low due to the lack of targets and the depth of the aquifer. The 891 residents of the City of Lenox receive their drinking water from two municipal wells, both located approximately 1/2 mile north of the Woolfolk site (Refs. 1, 3). The wells, owned and operated by the City of Lenox, draw water from the principal artesian aquifer situated in the Ocala Limestone. The Ocala Limestone is approximately 173 feet thick underneath the site and is typically found beginning at 350 feet below land surface (bls). The permeability of overlying strata is moderatly slow (Ref. 1).

The surface water pathway score is based on a potential release to Brushy Creek, the nearest surface water body to the site (Ref. 4). The site is flat, and poorly drained. During the fire, water was observed flowing into a municipal drainage ditch located along East Colquitt Street (Ref. 1). The ditch drains to the southeast, but its exact pathway and terminus are unknown. In the absence of this data, a probable point of entry (PPE) was established using U.S. Geological Survey topographic maps (Ref. 4). The PPE is located 3,500 feet to the southeast

Survey topographic maps (Ref. 4). The PPE is located 3,500 feet to the southeast of the site at Brushy Creek (Ref. 4). Brushy Creek flows to the south, eventually converging with the New River approximately 14 miles downstream of the PPE (Ref. 4). The alluvial floodplains of the New River are habitats for the American alligator (*Alligator americana*) and the Indigo snake (*Drymarchon corais couperi*), both federally designated endangered species (Refs. 1, 7). The surface water pathway contains no drinking water inlets or commercial fisheries within the 15-mile target distance limit (Refs. 5, 6). Recreational activity and sport fishing along the surface water pathway is minimal (Ref. 5). No wetlands are associated with the surface water pathway (Refs. 1, 4, 7).

The Woolfolk site is located in a low density residential area (Refs. 1, 4). There are approximatey 891 residents within a 4-mile radius of the site (Ref. 3). The nearest residence is approximately 200 feet to the south of the warehouse, on the opposite side of East Colquitt Street (Refs. 1, 4). The soil exposure pathway was scored based on an observed release to surficial soils, with no onsite workers or resident populations (Refs. 1, 2). Access to the site is unlimited, and children have been observed playing at the site. The air pathway score was based on a potential release and a target value derived from nearby populations and two federally endangered species potentially inhabiting areas within a 4-mile radius of the site (Refs. 1, 2, 3, 4, 7).

**HRS SCORING SUMMARY**

| | | |
|---|---|---|
| Sgw | = | 0.16 |
| Ssw | = | 0.90 |
| Sso | = | 0.02 |
| Sa | = | 0.03 |
| **OVERALL SCORE** | = | **0.52** |

Due to low target values and pathway scores, no further action is recommended for the Woolfolk Chemical Warehouse.

Please find attached additional references collected during this investigation. If you have any comments or questions, please call me at (510) 246-8010, or Victor Blix at (404) 643-2320.

Mr. Narindar Kumar

BVWS Projects 52012.429
June 9, 1994

Sincerely,

BLACK & VEATCH Waste Science, Inc.

Jon Erskine
Project Geologist

jae
Enclosures

## REFERENCES


1. Georgia Environmental Protection Division, Remedial Action Unit, Site Investigation Report, Woolfolk Chemical Works, Lenox, Georgia, February, 1985.

2. Susan Coker, Weston SPER, memorandum to Ron Dobbs, EPA Region IV, April 9, 1985. Subject: Woolfolk Chemical Site Monitoring.

3. U.S. Environmental Protection Agency, Graphical Exposure Modeling System (GEMS) Data Base. Compiled from U.S. Bureau of the Census data, 1983.

4. U.S. Geological Survey, 7.5 minute series Topographic Quadrangle Maps of Georgia: Lenox, GA, 1973, Adel, GA, 1973, Nashville West, GA, 1973; scale 1:24,000.

5. Dan Holder, Georgia Department of Natural Resources, Wildlife Division, Fisheries Management, telephone conversation with Jon Erskine, Black and Veatch Waste Science, Inc., May 5, 1994. Subject: Fisheries.

6. Buddy Guy, City of Adel, Water and Sewer Department, telephone conversation with Jon Erskine, Black and Veatch Waste Science, Inc., May 5, 1994. Subject: City of Adel municipal water.

7. Georgia Department of Natural Resources, Wildlife Resources Division, Georgia Natural Heritage Program Database, January 1994.

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# GROUND WATER MIGRATION PATHWAY SCORESHEET

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 1. Observed Release | 550 | 0 | |
| 2. Potential to Release | | | |
| 2a. Containment | 10 | 20 | |
| 2b. Net Precipitation | 10 | 6 | |
| 2c. Depth to Aquifer | 5 | 1 | |
| 2d. Travel Time | 35 | 15 | |
| 2e. Potential to Release [lines 2a x (2b + 2c + 2d)] | 500 | 220 | |
| 3. Liklihood of Release (higher of lines 1 and 2e) | 550 | | 220 |
| **Waste Characteristics** | | | |
| 4. Toxicity/Mobility | a | 10 | |
| 5. Hazardous Waste Quantity | a | 10 | |
| 6. Waste Characteristics | 100 | | 3 |
| **Targets** | | | |
| 7. Nearest Well | 50 | 18 | |
| 8. Population | | | |
| 8a. Level I Concentrations | b | 0 | |
| 8b. Level II Concentrations | b | 0 | |
| 8c. Potential Contamination | b | 32.4 | |
| 8d. Population (lines 8a + 8b + 8c) | b | 32.4 | |
| 9. Resources | 5 | 5 | |
| 10. Wellhead Protection Area | 20 | 0 | |
| 11. Targets (lines 7 + 8d + 9 + 10) | b | | 55.4 |
| **Ground Water Migration Score for an Aquifer** | | | |
| 12. Aquifer Score [(lines 3 x 6 x 11)/82,500][c] | 100 | | 0.4 |
| **Ground Water Migration Pathway Score** | | | |
| 13. Pathway Score ($S_{GW}$), (highest value from line 12 for all aquifers evaluated)[c] | 100 | | 0.4 |

a Maximum value applies to waste characteristics category

b Maximum value not applicable

c Do not round to nearest integer

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

## Drinking Water Threat

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 1. Observed Release | 550 | 0 | |
| 2. Potential to Release by Overland Flow | | | |
| 2a. Containment | 10 | 10 | |
| 2b. Runoff | 25 | 3 | |
| 2c. Distance to Surface Water | 25 | 6 | |
| 2d. Potential to Release by Overland Flow [lines 2a x (2b + 2c)] | 500 | 90 | |
| 3. Potential to Release by Flood | | | |
| 3a. Containment (Flood) | 10 | 10 | |
| 3b. Flood Frequency | 50 | 25 | |
| 3c. Potential to Release by Flood (lines 3a x 3b) | 500 | 250 | |
| 4. Potential to Release (lines 2d + 3c, subject to a maximum of 500) | 500 | 340 | |
| 5. Liklihood of Release (higher of lines 1 and 4) | 550 | | 340 |
| **Waste Characteristics** | | | |
| 6. Toxicity/Persistence | a | 1000 | |
| 7. Hazardous Waste Quantity | a | 10 | |
| 8. Waste Characteristics | 100 | | 10 |
| **Targets** | | | |
| 9. Nearest Intake | 50 | 0 | |
| 10. Population | | | |
| 10a. Level I Concentrations | b | | |
| 10b. Level II Concentrations | b | 0 | |
| 10c. Potential Contamination | b | 0 | |
| 10d. Population (lines 10a + 10b + 10c) | b | 0 | |
| 11. Resources | 5 | 5 | |
| 12. Targets (lines 9 + 10d + 11) | b | | 5 |

## Drinking Water Threat Score

| | | | |
|---|---|---|---|
| 13. Drinking Water Threat Score [(lines 5 x 8 x 12)/82,500], subject to a maximum of 100) | 100 | | 0.2 |

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET (CONTINUED)

## Human Food Chain Threat

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 14. Liklihood of Release (same value as line 5) | 550 | | 200 |
| **Waste Characteristics** | | | |
| 15. Toxicity/Persistence/Bioaccumulation | a | 50000000 | |
| 16. Hazardous Waste Quantity | a | 10 | |
| 17. Waste Characteristics | 1000 | | 100 |
| **Targets** | | | |
| 18. Food Chain Individual | 50 | 0 | |
| 19. Population | | | |
| 19a. Level I Concentrations | b | | |
| 19b. Level II Concentrations | b | | |
| 19c. Potential Contamination | b | 0 | |
| 19d. Population (lines 10a + 10b + 10c) | b | 0 | |
| 20. Targets (lines 18 + 19d) | b | | 0 |

## Human Food Chain Threat Score

| | | | |
|---|---|---|---|
| 21. Human Food Chain Threat Score [(lines 14 x 17 x 20)/82,500], subject to a maximum of 100) | 100 | | 0 |

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET (CONTINUED)

## Environmental Threat

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 22. Liklihood of Release (same value as line 5) | 550 | | 340 |
| **Waste Characteristics** | | | |
| 23. Ecosystem Toxicity/Persistence/Bioaccumulation | a | 500000000 | |
| 24. Hazardous Waste Quantity | a | 10 | |
| 25. Waste Characteristics | 1,000 | | 180 |
| **Targets** | | | |
| 26. Sensitive Environments | | | |
| 26a. Level I Concentrations | b | | |
| 26b. Level II Concentrations | b | | |
| 26c. Potential Contamination | b | 0.15 | |
| 26d. Sensitive Environments (lines 26a + 26b + 26c) | b | 0.15 | |
| 27. Targets (value from line 26d) | b | | 0.15 |
| **Environmental Threat Score** | | | |
| 28. Environmental Threat Score [(lines 22 x 25 x 27)/ 82,500, subject to a maximum score of 60) | 60 | | |
| **Surface Water Overland/Flood Migration Component Score for a Watershed** | | | |
| 29. Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum score of 100) | 100 | | 0.3 |
| **Surface Water Overland/Flood Component Score** | | | |
| 30. Component Score ($S_{SW}$)[c] (highest score from line 29 for all watersheds evaluated, subject to a maximum score of 100) | 100 | | 0.3 |

[a] Maximum value applies to waste characteristics category

[b] Maximum value not applicable

[c] Do not round to nearest integer

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# SOIL EXPOSURE PATHWAY SCORESHEET

## Resident Population Threat

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 1. Liklihood of Exposure | 550 | | 550 |
| **Waste Characteristics** | | | |
| 2. Toxicity | a | 1000 | |
| 3. Hazardous Waste Quantity | a | 10 | |
| 4. Waste Characteristics | 100 | | 10 |
| **Targets** | | 0 | |
| 5. Resident Individual | 50 | | |
| 6. Resident Population | | | |
| 6a. Level I Concentrations | b | | |
| 6b. Level II Concentrations | b | | |
| 6c. Resident Population (lines 6a + 6b) | b | | |
| 7. Workers | 15 | 0 | |
| 8. Resources | 5 | 0 | |
| 9. Terrestrial Sensitive Environments | c | 0 | |
| 10. Targets (lines 5 + 6c + 7 + 8 + 9) | b | | 0 |

## Resident Population Threat Score

| | | | |
|---|---|---|---|
| 11. Resident Population Threat [(lines 1 x 4 x 10)/82,500] | b | | 0 |

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# SOIL EXPOSURE PATHWAY SCORESHEET (continued)

**Nearby Population Threat**

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| Liklihood of Release | | | |
| 12. Attractiveness/Accessibility | 100 | 10 | |
| 13. Area of Contamination | 100 | 5 | |
| 14. Liklihood of Exposure | 500 | | 5 |
| Waste Characteristics | | | |
| 15. Toxicity | a | 1000 | |
| 16. Hazardous Waste Quantity | a | 10 | |
| 17. Waste Characteristics | 100 | | 10 |
| Targets | | | |
| 18. Nearby Individual | 1 | 1 | |
| 19. Population Within 1 Mile | b | 0.6 | |
| 20. Targets (lines 18 + 19) | b | | 1.6 |
| **Nearby Popuation Threat Score** | | | |
| 21. Nearby Population Threat (lines 14 x 17 x 20)/(82,500) | b | | 0.04 |
| **Soil Exposure Pathway Score** | | | |
| 22. Soil Exposure Pathway Score ($S_S$), (lines 11 + 21, subject to a maximum score of 100) | 100 | | 0.04 |

a Maximum value applies to waste characteristics category.

b Maximum value not applicable.

c No specific maximum value applies to factor. However, pathway score based solely on sensitive environments is limited to maximum score of 60.

d Do not round to nearest integer.

Site Name: Woolfolk Chemical – Lenox Warehouse

Location: Lenox, Georgia

# AIR MIGRATION PATHWAY SCORESHEET

| Factor Categories and Factors | Maximum Value | Value Assigned | |
|---|---|---|---|
| **Liklihood of Release** | | | |
| 1. Observed Release | 550 | 0 | |
| 2. Potential to Release | | | |
| 2a. Gas Potential to Release | 500 | 300 | |
| 2b. Particulate Potential to Release | 500 | 250 | |
| 2c. Potential to Release (higher of lines 2a and 2b) | 500 | 300 | |
| 3. Liklihood of Release (higher of lines 1 and 2c) | 550 | | 300 |
| **Waste Characteristics** | | | |
| 4. Toxicity/Mobility | a | | |
| 5. Hazardous Waste Quantity | a | | |
| 6. Waste Characteristics | 100 | | 1 |
| **Targets** | | | |
| 7. Nearest Individual | 50 | 20 | |
| 8. Population | | | |
| 8a. Level I Concentrations | b | | |
| 8b. Level II Concentrations | b | | |
| 8c. Potential Contamination | b | 1.3 | |
| 8d. Population (lines 8a + 8b + 8c) | b | 2.3 | |
| 9. Resources | 5 | 0 | |
| 10. Sensitive Environments | | | |
| 10a. Actual Contamination | c | 0 | |
| 10b. Potential Contamination | c | 0.24 | |
| 10c. Sensitive Environments (lines 10a + 10b) | c | 0.24 | |
| 11. Targets (lines 7 + 8d + 9 + 10c) | b | | 21.54 |
| **Air Migration Pathway Score** | | | |
| 12. Pathway Score ($S_A$) [(lines 3 x 6 x 11)/82,500][d] | 100 | | 0.16 |

a Maximum value applies to waste characteristics category

b Maximum value not applicable

c No specific maximum value applies to factor. However, pathway score based solely on sensitive environments is limited to a maximum score of 60.

d Do not round to nearest integer

# SITE INSPECTION WORKSHEETS

| CERCLIS IDENTIFICATION NUMBER |
|---|
| GA D082832841 |

| SITE LOCATION | | | |
|---|---|---|---|
| SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE<br>**Woolfolk Chemical - Lennox Warehouse** | | | |
| STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFIER<br>**Intersection of Rentz Avenue and East Coqutt Street** | | | |
| CITY<br>**Lennox** | STATE<br>**GA** | ZIP CODE | TELEPHONE<br>( ) |
| COORDINATES: LATITUDE and LONGITUDE<br>**31°16'17"; 83°27'45"** | TOWNSHIP, RANGE, AND SECTION | | |

| OWNER/OPERATOR IDENTIFICATION | | | | | |
|---|---|---|---|---|---|
| OWNER<br>**Bobby Lindsey**<br>**Woolfolk Chemical** | | | OPERATOR | | |
| OWNER ADDRESS<br>**103 Magnolia Drive; P.O 1809** | | | OPERATOR ADDRESS | | |
| CITY<br>**Tifton** | | | CITY | | |
| STATE<br>**GA** | ZIP CODE<br>**31794** | TELEPHONE<br>**(912) 386-4300** | STATE | ZIP CODE | TELEPHONE<br>( ) |

| SITE EVALUATION | | |
|---|---|---|
| AGENCY/ORGANIZATION<br>**U.S. Environmental Protection Agency** | | |
| INVESTIGATOR<br>**BLACK & VEATCH Waste Science, Inc.** | | |
| CONTACT<br>**Jon A. Erskine** | | |
| ADDRESS<br>**2300 Clayton Road, Suite 220** | | |
| CITY<br>**Concord** | STATE<br>**CA** | ZIP CODE<br>**94520** |
| TELEPHONE<br>**( 510 246-8010** | | |

## GENERAL INFORMATION

Site Description and Operational History: Provide a brief description of the site and its operational history. State the site name, owner, operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note whether these activities are documented or alleged. Identify all source types and prior spills, floods, or fires. Summarize highlights of the PA and other investigations. Cite references.

**See Attached.**

## GENERAL INFORMATION (continued)

Site Sketch: Provide a sketch of the site. Indicate all pertinent features of the site and nearby environments including sources of wastes, areas of visible and buried wastes, buildings, residences, access roads, parking areas, fences, fields, drainage patterns, water bodies, vegetation, wells, sensitive environments, and other features.

**See Attached.**

## GENERAL INFORMATION (continued)

**Source Descriptions:** Describe all sources at the site. Identify source type and relate to waste disposal operations. Provide source dimensions and the best available waste quantity information. Describe the condition of sources and all containment structures. Cite references.

## SOURCE TYPES

Landfill: A man-made (by excavation or construction) or natural hole in the ground into which wastes have come to be disposed by backfilling, or by contemporaneous soil deposition with waste disposal.

Surface Impoundment: A natural topographic depression, man-made excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold an accumulation of liquid wastes, wastes containing free liquids, or sludges not backfilled or otherwise covered; depression may be wet with exposed liquid or dry if deposited liquid has evaporated, volatilized or leached; structures that may be described as lagoon, pond, aeration pit, settling pond, tailings pond, sludge pit; also a surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled).

Drum: A portable container designed to hold a standard 55-gallon volume of wastes.

Tank and Non-Drum Container: Any device, other than a drum, designed to contain an accumulation of waste that provides structural support and is constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic); any portable or mobile device in which waste is stored or otherwise handled.

Contaminated Soil: An area or volume of soil onto which hazardous substances have been spilled, spread, disposed, or deposited.

Pile: Any non-containerized accumulation above the ground surface of solid, non-flowing wastes; includes open dumps. Some types of waste piles are:

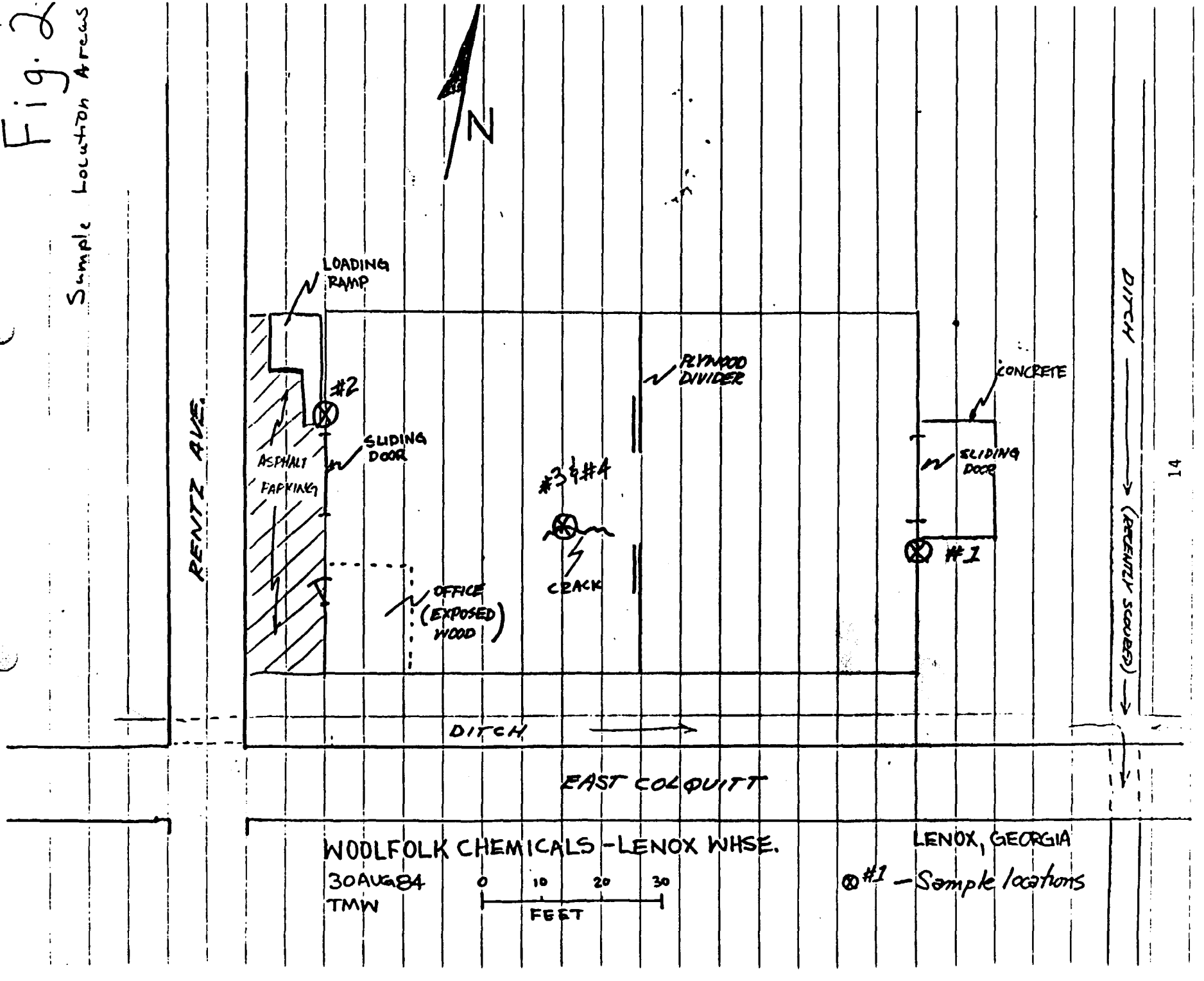
- Chemical Waste Pile: A pile consisting primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks.
- Scrap Metal or Junk Pile: A pile consisting primarily of scrap metal or discarded durable goods (such as appliances, automobiles, auto parts, batteries, etc.) composed of materials containing hazardous substances.
- Tailings Pile: A pile consisting primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation.
- Trash Pile: A pile consisting primarily of paper, garbage, or discarded non-durable goods containing hazardous substances.

Land Treatment: Landfarming or other method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

Other: Sources not in categories listed above.

Fig. 2

Sample Location Areas



## GENERAL INFORMATION (continued)

Source Description: Include description of containment per pathway for ground water (see HRS Table 3-2), surface water (see HRS Table 4-2), and air (see HRS Tables 6-3 and 6-9).

**Contaminated Surface Soil, no functioning windbreak, runnoff system or fence.**

Hazardous Waste Quantity (HWQ) Calculation: SI Tables 1 and 2 (See HRS Tables 2-5, 2-6, and 5-2).

**An area could not be calculated from soil sample locations; therefore, a HWQFV default of 10 was used in accordance with Section 2.4.2.2. of the HRS.**

Attach additional pages, if necessary

HWQ =

## SI TABLE 1: HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

| | | Single Source Sites (assigned HWQ scores) | |
|---|---|---|---|
| (Column 1) TIER | (Column 2) Source Type | (Column 3) HWQ = 10 | (Column 4) HWQ = 100 |
| A Hazardous Constituent Quantity | N/A | HWQ = 1 if Hazardous Constituent Quantity data are complete<br>HWQ = 10 if Hazardous Constituent Quantity data are not complete | >100 to 10,000 lbs |
| B Hazardous Wastestream Quantity | N/A | ≤ 500,000 lbs | >500,000 to 50 million lbs |
| C Volume | Landfill | ≤ 6.75 million $ft^3$<br>≤ 250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ |
| | Surface impoundment | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| | Drums | ≤1,000 drums | >1,000 to 100,000 drums |
| | Tanks and non-drum containers | ≤50,000 gallons | >50,000 to 5 million gallons |
| | Contaminated soil | ≤6.75 million $ft^3$<br>≤250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ |
| | Pile | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| | Other | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| D Area | Landfill | ≤340,000 $ft^2$<br>≤7.8 acres | >340,000 to 34 million $ft^2$<br>>7.8 to 780 acres |
| | Surface impoundment | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres |
| | Contaminated soil | ≤3.4 million $ft^2$<br>≤78 acres | > 3.4 million to 340 million $ft^2$<br>> 78 to 7,800 acres |
| | Pile | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres |
| | Land treatment | ≤27,000 $ft^2$<br>≤0.62 acres | >27,000 to 2.7 million $ft^2$<br>>0.62 to 62 acres |

TABLE 1 (CONTINUED)

| Single Source Sites (assigned HWQ scores) | | Multiple Source Sites | | |
|---|---|---|---|---|
| (Column 5)<br>HWQ = 10,000 | (Column 6)<br>HWQ = 1,000,000 | (Column 7)<br>Divisors for Assigning Source WQ Values | (Column 2)<br>Source Type | (Column 1)<br>TIER |
| >10,000 to 1 million lbs | > 1 million lbs | lbs ÷ 1 | N/A | A<br>Hazardous Constituent Quantity |
| >50 million to 5 billion lbs | > 5 billion lbs | lbs ÷ 5,000 | N/A | B<br>Hazardous Wastestream Quantity |
| >675 million to 67.5 billion $ft^3$<br>>25 million to 2.5 billion $yd^3$ | > 67.5 billion $ft^3$<br>> 2.5 billion $yd^3$ | $ft^3$ ÷ 67,500<br>$yd^3$ ÷ 2,500 | Landfill | C<br>Volume |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Surface Impoundment | |
| >100,000 to 10 million drums | > 10 million drums | drums ÷ 10 | Drums | |
| >5 million to 500 million gallons | > 500 million gallons | gallons ÷ 500 | Tanks and non-drum containers | |
| >675 million to 67.5 billion $ft^3$<br>>25 million to 2.5 billion $yd^3$ | > 67.5 billion $ft^3$<br>> 2.5 billion $yd^3$ | $ft^3$ ÷ 67,500<br>$yd^3$ ÷ 2,500 | Contaminated Soil | |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Pile | |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Other | |
| >34 million to 3.4 billion $ft^2$<br>>780 to 78,000 acres | > 3.4 billion $ft^2$<br>>78,000 acres | $ft^2$ ÷ 3,400<br>acres ÷ 0.078 | Landfill | D<br>Area |
| >130,000 to 13 million $ft^2$<br>>2.9 to 290 acres | > 13 million $ft^2$<br>> 290 acres | $ft^2$ ÷ 13<br>acres ÷ 0.00029 | Surface Impoundment | |
| > 340 million to 34 billion $ft^2$<br>> 7,800 to 780,000 acres | > 34 billion $ft^2$<br>> 780,000 acres | $ft^2$ ÷ 34,000<br>acres ÷ 0.78 | Contaminated Soil | |
| > 130,000 to 13 million $ft^2$<br>> 2.9 to 290 acres | > 13 million $ft^2$<br>> 290 acres | $ft^2$ ÷ 13<br>acres ÷ 0.00029 | Pile | |
| >2.7 million to 270 million $ft^2$<br>>62 to 6,200 acres | > 270 million $ft^2$<br>> 6,200 acres | $ft^2$ ÷ 270<br>acres ÷ 0.0062 | Land Treatment | |

## HAZARDOUS WASTE QUANTITY (HWQ) CALCULATION

For each migration pathway, evaluate HWQ associated with sources that are available (i.e., incompletely contained) to migrate to that pathway. (Note: If *Actual Contamination Targets* exist for ground water, surface water, or air migration pathways, assign the calculated HWQ score or 100, whichever is greater, as the HWQ score for that pathway.) For each source, evaluate HWQ for one or more of the four tiers (SI Table 1; HRS Table 2-5) for which data exist: constituent quantity, wastestream quantity, source volume, and source area. Select the tier that gives the highest value as the source HWQ. Select the source volume HWQ rather than source area HWQ if data for both tiers are available.

Column 1 of SI Table 1 indicates the quantity tier. Column 2 lists source types for the four tiers. Columns 3, 4, 5, and 6 provide ranges of waste amount for sites with only one source, corresponding to HWQ scores at the tops of the columns. Column 7 provides formulas to obtain source waste quantity values at sites with multiple sources.

1. Identify each source type.
2. Examine all waste quantity data available for each source. Record constituent quantity and waste stream mass or volume. Record dimensions of each source.
3. Convert source measurements to appropriate units for each tier to be evaluated.
4. For each source, use the formulas in the last column of SI Table 1 to determine the waste quantity value for each tier that can be evaluated. Use the waste quantity value obtained from the highest tier as the quantity value for the source.
5. Sum the values assigned to each source to determine the total site waste quantity.
6. Assign HWQ score from SI Table 2 (HRS Table 2-6).

Note these exceptions to evaluate soil exposure pathway HWQ (see HRS Table 5-2):

- The divisor for the area (square feet) of a landfill is 34,000.
- The divisor for the area (square feet) of a pile is 34.
- Wet surface impoundments and tanks and non-drum containers are the only sources for which volume measurements are evaluated for the soil exposure pathway.

SI TABLE 2: HWQ SCORES FOR SITES

| Site WQ Total | HWQ Score |
|---|---|
| 0 | 0 |
| 1[a] to 100 | 1[b] |
| > 100 to 10,000 | 100 |
| > 10,000 to 1 million | 10,000 |
| > 1 million | 1,000,000 |

[a] If the WQ total is between 0 and 1, round it to 1.
[b] If the hazardous constituent quantity data are not complete, assign the score of 10.

SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

Site Name: **Woolfolk Chemical**

References **1, SCDM March 1993**

Sources:

1. **Contaminated Soil**
2.
3.
4.
5.
6.
7.
8.
9.

| SOURCE | HAZARDOUS SUBSTANCE | TOXICITY | GROUND WATER PATHWAY | | SURFACE WATER PATHWAY | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | OVERLAND/FLOOD MIGRATION | | | | | | | GROUND WATER TO SURFACE WATER | | | |
| | | | GW Mobility (HRS Table 3-8) | Tox/ Mobility Value (HRS Table 3-9) | Per (HRS Tables 4-10 and 4-11) | Tox/Per Value (HRS Table 4-12) | Bioac Per. (HRS Table 4-15) | Tox/ Pers/ Bioac Value (HRS Table 4-16) | Ecotox (HRS Table 4-19) | Ecotox/ Pers (HRS Table 4-20) | Ecotox/ Pers/ Bioacc Value (HRS Table 4-21) | Tox/ Mob/ Pers Value (HRS Table 4-26) | Tox/ Mob/ Pers/ Bioacc Value (HRS Table 4-28) | Ecotox/ Mob/ Pers Value (HRS Table 4-29) | Ecotox/ Mob/ Per/ Bioacc Value (HRS Table 4-30) |
| 1 | toxaphene | 1,000 | 0.01 | 10 | 1.0 | 1,000 | 50,000 | 5E+07 | 10,000 | 10,000 | 5E+08 | NOT SCORED | | | |

## Ground Water Observed Release Substances Summary Table

On SI Table 4, list the hazardous substances associated with the site detected in ground water samples for that aquifer. Include only those substances directly observed or with concentrations significantly greater than background levels. Obtain toxicity values from the Superfund Chemical Data Matrix (SCDM). Assign mobility a value of 1 for all observed release substances regardless of the aquifer being evaluated. For each substance, multiply the toxicity by the mobility to obtain the toxicity/mobility factor value; enter the highest toxicity/mobility value for the aquifer in the space provided.

## Ground Water Actual Contamination Targets Summary Table

If there is an observed release at a drinking water well, enter each hazardous substance meeting the requirements for an observed release by well and sample ID on SI Table 5 and record the detected concentration. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population using the well as a Level I target. If these percentages are less than 100% or all are N/A, evaluate the population using the well as a Level II target for that aquifer.

SI TABLE 4: GROUND WATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

NONE

| Sample ID | Hazardous Substance | Bckgrd. Conc. | Toxicity/ Mobility | References |
|---|---|---|---|---|
| N/A | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | Highest Toxicity/Mobility | | |

SI TABLE 5: GROUND WATER ACTUAL CONTAMINATION TARGETS

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# GROUND WATER PATHWAY
## GROUND WATER USE DESCRIPTION

Describe Ground Water Use within 4 Miles of the Site:
Describe generalized stratigraphy, aquifers, municipal and private wells

**Groundwater is taken from the Ocala Aquifer at 350 ft below ground surface. The city of Lennox draws water from 2 deep wells. The wells serve 891 residents. The stratigraphy at the site is composed of Sand, Clay, and limestone.**

Show Calculations of Ground Water Drinking Water Populations for each Aquifer:
Provide apportionment calculations for blended supply systems.
County average number of persons per household: _____ Reference **Ref. 4**

**No private groundwater wells within 4 miles. Municipal system serves 891 people. It consists of 2 municipal wells. No surface water. Each well serves approx. 445.5 people.**

| | | |
|---|---|---|
| **0 wells** | **0 - 1/4 mile:** | **0** |
| **2 municipal wells** | **1/4 - 1/2 mile:** | **2 x 445.5 = 891** |
| **0 wells** | **1/2 - 1 mile:** | **0** |
| **0 wells** | **1 - 2 miles:** | **0** |
| **0 wells** | **2 - 3 miles:** | **0** |
| **0 wells** | **3 - 4 miles:** | **0** |

# GROUND WATER PATHWAY WORKSHEET

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4. | 0 | H | 1 |
| 2. POTENTIAL TO RELEASE: Depth to aquifer: 173 feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3. | 220 | E/H | 1,4 |
| LR = | 220 | | |

| TARGETS | | | |
|---|---|---|---|
| Are any wells part of a blended system? Yes____ No X<br>If yes, attach a page to show apportionment calculations.<br><br>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5).<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ Total = | 0 | H | 1 |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1. | 32.4 | E/H | 1 |
| 5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles, assign 0. | 18 | H | 1 |
| 6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a ground water observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0. | 0 | E | 1 |
| 7. RESOURCES: Assign a score of 5 if one or more ground water resource applies; assign 0 if none applies.<br><br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering of commercial livestock<br>• Ingredient in commercial food preparation<br>• Supply for commercial aquaculture<br>• Supply for a major or designated water recreation area, excluding drinking water use | 5 | E | 4 |
| Sum of Targets T= | 55.4 | | |

SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS

SI Table 6a: Other Than Karst Aquifers

| Distance from Site | Pop. | Nearest Well (choose highest) | Population Served by Wells within Distance Category | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to $\frac{1}{4}$ mile | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | | |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | 891 | 18 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | 324 | 1,4 |
| > $\frac{1}{2}$ to 1 mile | | 9 | 1 | 5 | 17 | 52 | 167 | 523 | 1,669 | 5,224 | 16,684 | 52,239 | 166,835 | 522,385 | | |
| > 1 to 2 miles | | 5 | 0.7 | 3 | 10 | 30 | 94 | 294 | 939 | 2,939 | 9,385 | 29,384 | 93,845 | 293,842 | | |
| > 2 to 3 miles | | 3 | 0.5 | 2 | 7 | 21 | 68 | 212 | 678 | 2,122 | 6,778 | 21,222 | 67,777 | 212,219 | | |
| >3 to 4 miles | | 2 | 0.3 | 1 | 4 | 13 | 42 | 131 | 417 | 1,306 | 4,171 | 13,060 | 41,709 | 130,596 | | |

Nearest Well = 18

Sum = 324

SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS (continued)

SI Table 6b: Karst Aquifers

| Distance from Site | Pop. | Nearest Well (choose highest) | Population Served by Wells within Distance Category | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to $\frac{1}{4}$ mile | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | | |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | | 20 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | | |
| > $\frac{1}{2}$ to 1 mile | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| > 1 to 2 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| > 2 to 3 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| >3 to 4 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |

Nearest Well = [ ]  Sum = [ ]

# GROUND WATER PATHWAY WORKSHEET (concluded)

| WASTE CHARACTERISTICS | Score | Data Type | Does not Apply |
|---|---|---|---|
| 8. If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to ground water. | 10 | E | |
| 9. Assign the highest ground water toxicity/mobility value from SI Table 3 or 4. | 10 | | |
| 10. Multiply the ground water toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7) | 3 | | |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

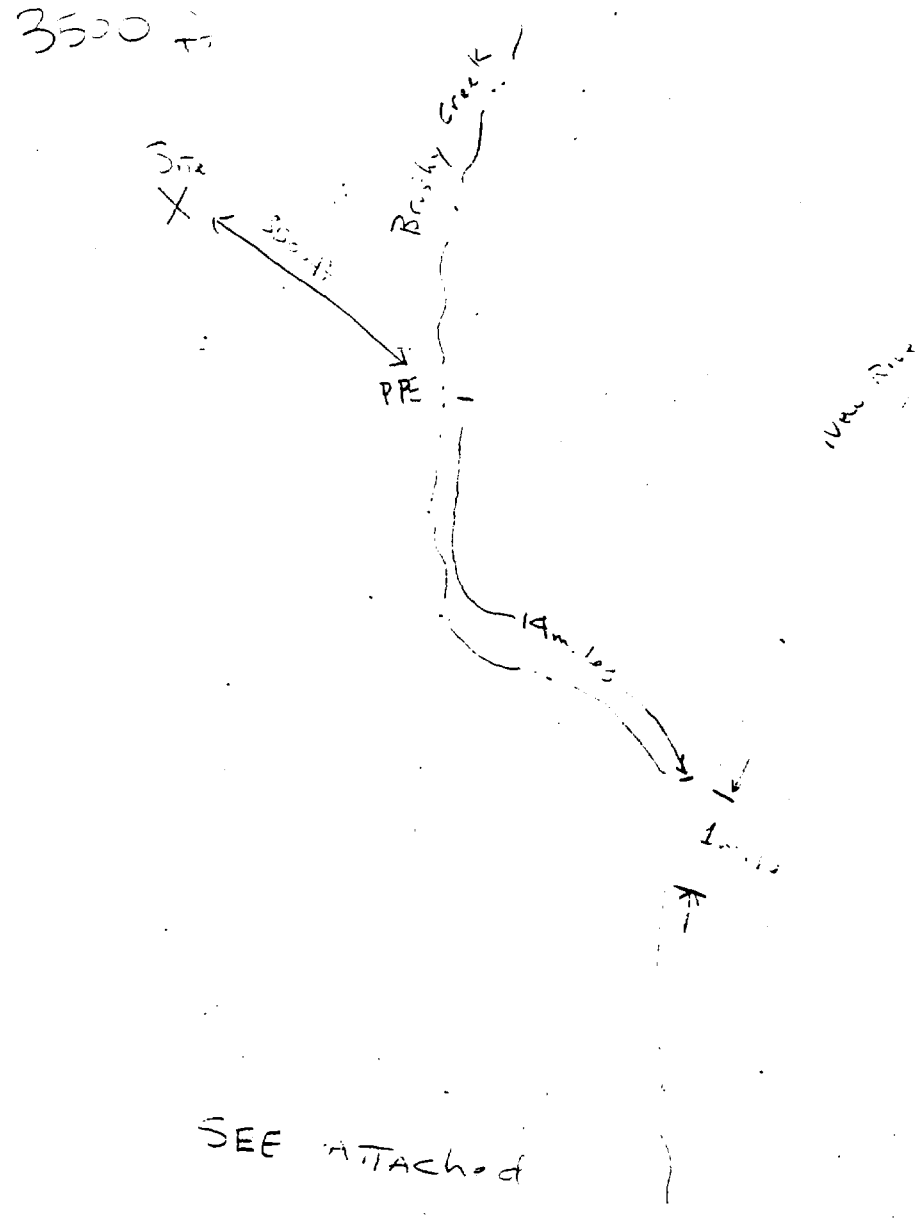
WC = 3

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the ground water pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

GROUND WATER PATHWAY SCORE: $\frac{LR \times T \times WC}{82,500}$ **0.4** (Maximum of 100)

# SURFACE WATER PATHWAY

**Sketch of the Surface Water Migration Route:**
Label all surface water bodies. Include runoff route and drainage direction, probable point of entry, and 15-mile target distance limit. Mark sample locations, intakes, fisheries, and sensitive environments. Indicate flow directions, tidal influence, and rate.



## SURFACE WATER PATHWAY

### Surface Water Observed Release Substances Summary Table

On SI Table 7, list the hazardous substances detected in surface water samples for the watershed, which can be attributed to the site. Include only those substances in observed releases (direct observation) or with concentration levels significantly above background levels. Obtain toxicity, persistence, bioaccumulation potential, and ecotoxicity values from SCDM. Enter the highest toxicity/persistence, toxicity/persistence/bioaccumulation, and ecotoxicity/persistence/ecobioaccumulation values in the spaces provided.

- TP = Toxicity x Persistence
- TPB = TP x bioaccumulation
- ETPB = EP x bioaccumulation (EP = ecotoxicity x persistence)

### Drinking Water Actual Contamination Targets Summary Table

For an observed release at or beyond a drinking water intake, on SI Table 8 enter each hazardous substance by sample ID and the detected concentration. For surface water sediment samples detecting a hazardous substance at or beyond an intake, evaluate the intake as Level II contamination. Obtain benchmark, cancer risk, and reference dose concentrations for each substance from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages of the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population served by the intake as a Level I target. If the percentages are less than 100% or all are N/A, evaluate the population served by the intake as a Level II target.

## SI TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

**NONE.**

| Sample ID | Hazardous Substance | Bckgrd. Conc. | Toxicity/ Persistence | Toxicity/ Persis./ Bioaccum | Ecotoxicity/ Persis/ Ecobioaccum | References |
|---|---|---|---|---|---|---|
| 0 | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | Highest Values | | | | |

## SI TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# SURFACE WATER PATHWAY
## LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

| LIKELIHOOD OF RELEASE– OVERLAND/FLOOD MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. | 0 | | 1,4 |
| 2. POTENTIAL TO RELEASE: Distance to surface water: 3500 (feet) If sampling data do not support a release to surface water in the watershed, use the table below to assign a score from the table below based on distance to surface water and flood frequency. | 340 | E | 1,4,7 |
| Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2 | | | |
| LR = | 340 | | |

| Distance to surface water | |
|---|---|
| Distance to surface water <2500 feet | 500 |
| Distance to surface water >2500 feet. and: | |
| Site in annual or 10-yr floodplain | 500 |
| Site in 100-yr floodplain | 400 |
| Site in 500-yr floodplain | 300 |
| Site outside 500-yr floodplain | 100 |

| LIKELIHOOD OF RELEASE GROUND WATER TO SURFACE WATER MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. | NOT SCORED | | |
| NOTE: Evaluate ground water to surface water migration only for a surface water body that meets all of the following conditions: 1) A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0. 2) No aquifer discontinuity is established between the source and the above portion of the surface water body. 3) The top of the uppermost aquifer is at or above the bottom of the surface water. Elevation of top of uppermost aquifer _____ Elevation of bottom of surface water body _____ | 0 | | |
| 2. POTENTIAL TO RELEASE: Use the ground water potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2. | | | 3.12 |
| LR = | | | |

## SURFACE WATER PATHWAY
### LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET (CONTINUED)

| DRINKING WATER THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type, flow, and number of people served by each drinking water intake within the target distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5.<br><br>Intake Name / Water Body Type / Flow / People Served<br>_____ _____ _____ _____<br>_____ _____ _____ _____<br>_____ _____ _____ _____<br><br>Are any intakes part of a blended system? Yes _____ No X<br>If yes, attach a page to show apportionment calculations.<br><br>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8).<br><br>_____ _____<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ Total = | 0 | H | 1 |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1. | 0 | H | 1 |
| 5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0. | 0 | H | 1 |
| 6. RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign 0 if none applies.<br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering of commercial livestock<br>• Ingredient in commercial food preparation<br>• Major or designated water recreation area, excluding drinking water use | 5 | E | |
| SUM OF TARGETS T= | 5 | | |

SI TABLE 9 (From HRS Table 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY

| Type of Surface Water Body | Pop. | Nearest Intake | Number of people | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,000 | 10,001 to 30,000 | |
| Minimal Stream (<10 cfs) | | 20 | 0 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | |
| Small to moderate stream (10 to 100 cfs) | | 2 | 0 | 0.4 | 2 | 5 | 16 | 52 | 163 | 521 | 1,633 | |
| Moderate to large stream (> 100 to 1,000 cfs) | | 0 | 0 | 0.04 | 0.2 | 0.5 | 2 | 5 | 16 | 52 | 163 | |
| Large Stream to river (>1,000 to 10,000 cfs) | | 0 | 0 | 0.004 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | 5 | 16 | |
| Large River (> 10,000 to 100,000 cfs) | | 0 | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 16 | |
| Very Large River (>100,000 cfs) | | 0 | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Shallow ocean zone or Great Lake (depth < 20 feet) | | 0 | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | |
| Moderate ocean zone or Great Lake (Depth 20 to 200 feet) | | 0 | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Deep ocean zone or Great Lake (depth > 200 feet) | | 0 | 0 | 0 | 0 | 0 | 0.001 | 0.003 | 0.008 | 0.03 | 0.08 | |
| 3-mile mixing zone in quiet flowing river (≥ 10 cfs) | | 10 | 0 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | |
| Nearest Intake = | | 0 | | | | | | | | | Sum = | 0 |

References 1,4,7

## SURFACE WATER PATHWAY

### Human Food Chain Actual Contamination Targets Summary Table

On SI Table 10, list the hazardous substances detected in sediment, aqueous, sessile benthic organism tissue, or fish tissue samples (taken from fish caught within the boundaries of the observed release) by sample ID and concentration. Evaluate fisheries within the boundaries of observed releases detected by sediment or aqueous samples as Level II, if at least one observed release substance has a bioaccumulation potential factor value of 500 or greater (see SI Table 7). Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For FDAAL benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate this portion of the fishery as subject to Level I concentrations. If the percentages are less than 100% or all are N/A, evaluate the fishery as a Level II target.

### Sensitive Environment Actual Contamination Targets Summary Table

On SI Table 11, list each hazardous substance detected in aqueous or sediment samples at or beyond wetlands or a surface water sensitive environment by sample ID. Record the concentration. If contaminated sediments or tissues are detected at or beyond a sensitive environment, evaluate the sensitive environment as Level II. Obtain benchmark concentrations from SCDM. For AWQC/AALAC benchmarks, determine the highest percentage of benchmark of the substances detected in aqueous samples. If benchmark concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage equals or exceeds 100%, evaluate that part of the sensitive environment subject to Level I concentrations. If the percentage is less than 100%, or all are N/A, evaluate the sensitive environment as Level II.

SI TABLE 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED **NONE.**

Fishery ID: _____ Sample Type _____ Level I _____ Level II _____ References _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Benchmark Concentration (FDAAL) | % of Benchmark | Cancer Risk Concentration | % of Cancer Risk Concentration | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Concentration (AWQC or AALAC) | % of Benchmark | References |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | Highest Percent | | |

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Concentration (AWQC or AALAC) | % of Benchmark | References |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | Highest Percent | | |

# SURFACE WATER PATHWAY (continued)
## HUMAN FOOD CHAIN THREAT WORKSHEET

| HUMAN FOOD CHAIN THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page. | | | |
| Fishery Name NEW RIVER Water Body Stream Flow 200 cfs<br>Species____ Production____ lbs/yr<br>Species____ Production____ lbs/yr | | | |
| Fishery Name____ Water Body____ Flow____ cfs<br>Species____ Production____ lbs/yr<br>Species____ Production____ lbs/yr | | | |
| Fishery Name____ Water Body____ Flow____ cfs<br>Species____ Production____ lbs/yr<br>Species____ Production____ lbs/yr | | | |
| FOOD CHAIN INDIVIDUAL **20 x 0.01** | **0** | **E** | **7** |
| 7. ACTUAL CONTAMINATION FISHERIES:<br>If analytical evidence indicates that a fishery has been exposed to a hazardous substance with a bioaccumulation factor greater than or equal to 500 (SI Table 10), assign a score of 50 if there is a Level I fishery. Assign 45 if there is a Level II fishery, but no Level I fishery. | | | |
| 8. POTENTIAL CONTAMINATION FISHERIES:<br>If there is a release of a substance with a bioaccumulation factor greater than or equal to 500 to a watershed containing fisheries within the target distance limit, but there are no Level I or Level II fisheries, assign a score of 20.<br>If there is no observed release to the watershed, assign a value for potential contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit: | | | |

| Lowest Flow | FCI Value |
|---|---|
| <10 cfs | 20 |
| 10 to 100 cfs | 2 |
| >100 cfs, coastal tidal waters, oceans, or Great Lakes | 0 |
| 3-mile mixing zone in quiet flowing river | 10 |

| | | | |
|---|---|---|---|
| **0.03 x 0.01 x 0.1 Population** ~~XXXXXXXX~~ = | **0.00003** | **E** | |
| SUM OF TARGETS T = | **0.00003** | | |

## SURFACE WATER PATHWAY (continued)
## ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

| ENVIRONMENTAL THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|

Record the water body type and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of 0 at the bottom of the page.

| Environment Name | Water Body Type | Flow |
|---|---|---|
| American Alligator | Stream | 200 cfs |
| Indigo Snake | Stream | 200 cfs |
| | | cfs |
| | | cfs |
| | | cfs |

9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table 11, and assign a factor value for the environment (SI Tables 13 and 14).

| Environment Name | Environment Type and Value (SI Tables 13 & 14) | Multiplier (10 for Level I, 1 for Level II) | Product |
|---|---|---|---|
| | | x = | |
| | | x = | |
| | | x = | |
| | | x = | |
| | | Sum = | |

10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:

| Flow | Dilution Weight (SI Table 12) | Environment Type and Value (SI Tables 13 & 14) | Pot. Cont. | Product | Score | Data Type | Refs |
|---|---|---|---|---|---|---|---|
| 200 cfs | 0.01 x | American Alligator 75 x | 0.1 = | 0.075 | 0.15 | E/H | 1,7 |
| 200 cfs | 0.01 x | Indigo Snake 75 x | 0.1 = | 0.075 | | | |
| cfs | x | x | 0.1 = | | | | |
| cfs | x | x | 0.1 = | | | | |
| cfs | x | x | 0.1 = | | | | |
| | | | Sum = | | | | |

T = 0.15

SI TABLE 12 (HRS Table 4-13):
SURFACE WATER DILUTION WEIGHTS

| Type of Surface Water Body | | Assigned Dilution Weight |
|---|---|---|
| Descriptor | Flow Characteristics | |
| Minimal stream | < 10 cfs | 1 |
| Small to moderate stream | 10 to 100 cfs | 0.1 |
| Moderate to large stream | > 100 to 1,000 cfs | 0.01 |
| Large stream to river | > 1,000 to 10,000 cfs | 0.001 |
| Large river | > 10,000 to 100,000 cfs | 0.0001 |
| Very large river | > 100,000 cfs | 0.00001 |
| Coastal tidal waters | Flow not applicable; depth not applicable | 0.001 |
| Shallow ocean zone or Great Lake | Flow not applicable; depth less than 20 feet | 0.001 |
| Moderate depth ocean zone or Great Lake | Flow not applicable; depth 20 to 200 feet | 0.0001 |
| Deep ocean zone or Great Lake | Flow not applicable; depth greater than 200 feet | 0.000005 |
| 3-mile mixing zone in quiet flowing river | 10 cfs or greater | 0.5 |

## SI TABLE 13 (HRS TABLE 4-23): SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

| SENSITIVE ENVIRONMENT | ASSIGNED VALUE |
|---|---|
| Critical habitat for Federal designated endangered or threatened species<br>Marine Sanctuary<br>National Park<br>Designated Federal Wilderness Area<br>Ecologically important areas identified under the Coastal Zone Wilderness Act<br>Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act<br>Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes)<br>National Monument (air pathway only)<br>National Seashore Recreation Area<br>National Lakeshore Recreation Area | 100 |
| Habitat known to be used by Federal designated or proposed endangered or threatened species<br>National Preserve<br>National or State Wildlife Refuge<br>Unit of Coastal Barrier Resources System<br>Coastal Barrier (undeveloped)<br>Federal land designated for the protection of natural ecosystems<br>Administratively Proposed Federal Wilderness Area<br>Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary<br>Migratory pathways and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time<br>Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding<br>National river reach designated as recreational | 75 |
| Habitat known to be used by State designated endangered or threatened species<br>Habitat known to be used by a species under review as to its Federal endangered or threatened status<br>Coastal Barrier (partially developed)<br>Federally designated Scenic or Wild River | 50 |
| State land designated for wildlife or game management<br>State designated Scenic or Wild River<br>State designated Natural Area<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |
| State designated areas for the protection of maintenance of aquatic life under the Clean Water Act | 5 |
| Wetlands See SI Table 14 (Surface Water Pathway) or SI Table 23 (Air Pathway) | |

## SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

| Total Length of Wetlands | Assigned Value |
|---|---|
| Less than 0.1 mile | 0 |
| 0.1 to 1 mile | 25 |
| Greater than 1 to 2 miles | 50 |
| Greater than 2 to 3 miles | 75 |
| Greater than 3 to 4 miles | 100 |
| Greater than 4 to 8 miles | 150 |
| Greater than 8 to 12 miles | 250 |
| Greater than 12 to 16 miles | 350 |
| Greater than 16 to 20 miles | 450 |
| Greater than 20 miles | 500 |

## SURFACE WATER PATHWAY (concluded)

### WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

| WASTE CHARACTERISTICS | Score |
|---|---|
| 14. If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, assign the calculated hazardous waste quantity score, or a score of 100, whichever is greater. | 10 |
| 15. Assign the highest value from SI Table 7 (observed release) or SI Table 3 (no observed release) for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat. | 10 |

| | Substance Value | | HWQ | | Product | WC Score (from Table) (Maximum of 100) |
|---|---|---|---|---|---|---|
| Drinking Water Threat Toxicity/Persistence | 1000 | x | 10 | = | 10,000 | 10 |
| Food Chain Threat Toxicity/Persistence Bioaccumulation | 5E+07 | x | 10 | = | 5E+08 | 100 |
| Environmental Threat Ecotoxicity/Persistence/ Ecobioaccumulation | 5E+08 | x | 10 | = | 5E+09 | 180 |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 to <1E + 09 | 100 |
| 1E + 09 to <1E + 10 | 180 |
| 1E + 10 to <1E + 11 | 320 |
| 1E + 11 to <1E + 12 | 560 |
| 1E + 12 or greater | 1000 |

### SURFACE WATER PATHWAY THREAT SCORES

| Threat | Likelihood of Release (LR) Score | Targets (T) Score | Pathway Waste Characteristics (WC) Score (determined above) | Threat Score $\frac{LR \times T \times WC}{82,500}$ |
|---|---|---|---|---|
| Drinking Water | 340 | 5 | 10 | (maximum of 100) 0.2 |
| Human Food Chain | 340 | 0.00003 | 100 | (maximum of 100) 0 |
| Environmental | 340 | 0.15 | 180 | (maximum of 60) 0.1 |

| SURFACE WATER PATHWAY SCORE (Drinking Water Threat + Human Food Chain Threat + Environmental Threat) | (maximum of 100) 0.3 |
|---|---|

## SOIL EXPOSURE PATHWAY

If there is no observed contamination (e.g., ground water plume with no known surface source), do not evaluate the soil exposure pathway. Discuss evidence for no soil exposure pathway.

### Soil Exposure Resident Population Targets Summary

For each property (duplicate page 35 as necessary):

If there is an area of observed contamination on the property and within 200 feet of a residence, school, or day care center, enter on Table 15 each hazardous substance by sample ID. Record the detected concentration. Obtain cancer risk, and reference dose concentrations from SCDM. Sum the cancer risk and reference dose percentages for the substances listed. If cancer risk or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the residents and students as Level I. If both percentages are less than 100% or all are N/A, evaluate the targets as Level II.

## SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# SOIL EXPOSURE PATHWAY WORKSHEET
## RESIDENT POPULATION THREAT

| LIKELIHOOD OF EXPOSURE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0. | 550 | H | 2 |
| LE = | 550 | | |

| TARGETS | | | |
|---|---|---|---|
| 2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on or within 200 feet of areas of observed contamination (HRS section 5.1.3).<br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ Sum = | 0 | H | 1 |
| 3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (*i.e.*, no Level I or Level II targets), assign 0 (HRS Section 5.1.3). | 0 | H | 1 |
| 4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities with areas of observed contamination associated with the site. | 0 | H | 1 |
| 5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination.<br>Sum = | 0 | E/H | 1 |
| 6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on an area of observed contamination at the site; assign 0 if none applies.<br>• Commercial agriculture<br>• Commercial silviculture<br>• Commercial livestock production or commercial livestock grazing | 0 | E/H | 1 |
| Total of Targets T= | 0 | | |

| Number of Workers | Score |
|---|---|
| 0 | 0 |
| 1 to 100 | 5 |
| 101 to 1,000 | 10 |
| >1,000 | 15 |

| Terrestrial Sensitive Environment Type | Value |
|---|---|
| | |
| | |
| | |
| | |
| | |

## SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

| *TERRESTRIAL SENSITIVE ENVIRONMENT* | *ASSIGNED VALUE* |
|---|---|
| Terrestrial critical habitat for Federal designated endangered or threatened species<br>National Park<br>Designated Federal Wilderness Area<br>National Monument | 100 |
| Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species<br>National Preserve (terrestrial)<br>National or State terrestrial Wildlife Refuge<br>Federal land designated for protection of natural ecosystems<br>Administratively proposed Federal Wilderness Area<br>Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding | 75 |
| Terrestrial habitat used by State designated endangered or threatened species<br>Terrestrial habitat used by species under review for Federal designated endangered or threatened status | 50 |
| State lands designated for wildlife or game management<br>State designated Natural Areas<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |

## SOIL EXPOSURE PATHWAY WORKSHEET
## NEARBY POPULATION THREAT

| LIKELIHOOD OF EXPOSURE | Score | Data Type | Ref. |
|---|---|---|---|
| 7. Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6) Value 10<br>Area of Contamination (from SI Table 18 or HRS Table 5-7) Value 5<br>Likelihood of Exposure (from SI Table 19 or HRS Table 5-8) | 5 | | |
| LE = | 5 | | |

| TARGETS | Score | Data Type | Ref. |
|---|---|---|---|
| 8. Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated. | 0 | H | 4 |
| 9. Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (*i.e.*, properties that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS Table 5-10). Sum the population values and multiply by 0.1. | 0.6 | E/H | 3,4 |
| T = | 0.6 | | |

## SI TABLE 17 (HRS TABLE 5-6): ATTRACTIVENESS/ACCESSIBILITY VALUES

| Area of Observed Contamination | Assigned Value |
|---|---|
| Designated recreational area | 100 |
| Regularly used for public recreation (for example, vacant lots in urban area) | 75 |
| Accessible and unique recreational area (for example, vacant lots in urban area) | 75 |
| Moderately accessible (may have some access improvements–for example, gravel road) with some public recreation use | 50 |
| Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use | 25 |
| Accessible with no public recreation use | 10 |
| Surrounded by maintained fence or combination of maintained fence and natural barriers | 5 |
| Physically inaccessible to public, with no evidence of public recreation use | 0 |

## SI TABLE 18 (HRS TABLE 5-7): AREA OF CONTAMINATION FACTOR VALUES

| Total area of the areas of observed contamination (square feet) | Assigned Value |
|---|---|
| ≤ to 5,000 | 5 |
| > 5,000 to 125,000 | 20 |
| > 125,000 to 250,000 | 40 |
| > 250,000 to 375,000 | 60 |
| > 375,000 to 500,000 | 80 |
| > 500,000 | 100 |

## SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

| AREA OF CONTAMINATION FACTOR VALUE | ATTRACTIVENESS/ACCESSIBILITY FACTOR VALUE | | | | | | |
|---|---|---|---|---|---|---|---|
| | 100 | 75 | 50 | 25 | 10 | 5 | 0 |
| 100 | 500 | 500 | 375 | 250 | 125 | 50 | 0 |
| 80 | 500 | 375 | 250 | 125 | 50 | 25 | 0 |
| 60 | 375 | 250 | 125 | 50 | 25 | 5 | 0 |
| 40 | 250 | 125 | 50 | 25 | 5 | 5 | 0 |
| 20 | 125 | 50 | 25 | 5 | 5 | 5 | 0 |
| 5 | 50 | 25 | 5 | 5 | 5 | 5 | 0 |

## SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

| Travel Distance Category (miles) | Pop. | Number of people within the travel distance category | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,001 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | |
| Greater than 0 to $\frac{1}{4}$ | | 0 | 0.1 | 0.4 | 1.0 | 4 | 13 | 41 | 130 | 408 | 1,303 | 4,081 | 13,034 | 1 |
| Greater than $\frac{1}{4}$ to $\frac{1}{2}$ | | 0 | 0.05 | 0.2 | 0.7 | 2 | 7 | 20 | 65 | 204 | 652 | 2,041 | 6,517 | 2 |
| Greater than $\frac{1}{2}$ to 1 | | 0 | 0.02 | 0.1 | 0.3 | 1 | 3 | 10 | 33 | 102 | 326 | 1,020 | 3,258 | 3 |

Reference(s) 1,3,4

Sum = 6

# SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

WASTE CHARACTERISTICS

| | | |
|---|---|---|
| 10. | Assign the hazardous waste quantity score calculated for soil exposure | 10 |
| 11. | Assign the highest toxicity value from SI Table 16 | 1,000 |
| 12. | Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: | WC = 10 |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

RESIDENT POPULATION THREAT SCORE:

(Likelihood of Exposure, Question 1; Targets = Sum of Questions 2, 3, 4, 5, 6) $\frac{LE \times T \times WC}{82,500}$ **0**

NEARBY POPULATION THREAT SCORE:

(Likelihood of Exposure, Question 7; Targets = Sum of Questions 8, 9) $\frac{LE \times T \times WC}{82,500}$ **0.04**

SOIL EXPOSURE PATHWAY SCORE:
Resident Population Threat + Nearby Population Threat **0.04** (Maximum of 100)

## AIR PATHWAY

### Air Pathway Observed Substances Summary Table

On SI Table 21, list the hazardous substances detected in air samples of a release from the site. Include only those substances with concentrations significantly greater than background levels. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For NAAQS/NESHAPS benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate targets in the distance category from which the sample was taken and any closer distance categories as Level I. If the percentages are less than 100% or all are N/A, evaluate targets in that distance category and any closer distance categories that are not Level I as Level II.

## SI TABLE 21: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References _____

| Hazardous Substance | Conc. (µg/m³) | Gaseous Particulate | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References _____

| Hazardous Substance | Conc. (µg/m³) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References _____

| Hazardous Substance | Conc. (µg/m³) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# AIR PATHWAY WORKSHEET

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to air, assign a score of 550. Record observed release substances on SI Table 21. | 0 | | |
| 2. POTENTIAL TO RELEASE: If sampling data do not support a release to air, assign a score of 500. Optionally, evaluate air migration gaseous and particulate potential to release (HRS Section 6.1.2). | 300 | E | 1 |
| LR = | 300 | | |

| TARGETS | | | |
|---|---|---|---|
| 3. ACTUAL CONTAMINATION POPULATION: Determine the number of people within the target distance limit subject to exposure from a release of a hazardous substance to the air.<br>a) Level I: _____ people x 10 = _____<br>b) Level II: _____ people x 1 = _____ Total = | 0 | H | 1 |
| 4. POTENTIAL TARGET POPULATION: Determine the number of people within the target distance limit not subject to exposure from a release of a hazardous substance to the air, and assign the total population score from SI Table 22. Sum the values and multiply the sum by 0.1. | 1.3 | E/H | 3,4 |
| 5. NEAREST INDIVIDUAL: Assign a score of 50 if there are any Level I targets. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Population exists, assign the Nearest Individual score from SI Table 22. | 20 | H | 4 |
| 6. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (SI Table 13) and wetland acreage values (SI Table 23) for environments subject to exposure from the release of a hazardous substance to the air.<br>*Sensitive Environment Type* — *Value*<br>*Wetland Acreage* — *Value* | 0 | | |
| 7. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release. | 0.24 | | |
| 8. RESOURCES: Assign a score of 5 if one or more air resources apply within 1/2 mile of a source; assign a 0 if none applies.<br>• Commercial agriculture<br>• Commercial silviculture<br>• Major or designated recreation area | 0 | E/H | 1 |
| T = | 21.54 | | |

150 x 0.016

## SI TABLE 22 (From HRS TABLE 6-17): VALUES FOR POTENTIAL CONTAMINATION AIR TARGET POPULATIONS

| Distance from Site | Pop. | Nearest Individual (choose highest) | Number of People within the Distance Category | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | |
| On a source | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | 0 |
| 0 to $\frac{1}{4}$ mile | X | * | 1 | 4 | 13 | 41 | 131 | 408 | 1,304 | 4,081 | 13,034 | 40,812 | 130,340 | 408,114 | 4 |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | | 2 | 0.2 | 0.9 | 3 | 9 | 28 | 88 | 282 | 882 | 2,815 | 8,815 | 28,153 | 88,153 | 3 |
| > $\frac{1}{2}$ to 1 mile | | 1 | 0.06 | 0.3 | 0.9 | 3 | 8 | 26 | 83 | 261 | 834 | 2,612 | 8,342 | 26,119 | 3 |
| > 1 to 2 miles | | 0 | 0.02 | 0.09 | 0.3 | 0.8 | 3 | 8 | 27 | 83 | 266 | 833 | 2,659 | 8,326 | 3 |
| > 2 to 3 miles | | 0 | 0.009 | 0.04 | 0.1 | 0.4 | 1 | 4 | 12 | 38 | 120 | 375 | 1,199 | 3,755 | 0 |
| >3 to 4 miles | | 0 | 0.005 | 0.02 | 0.07 | 0.2 | 0.7 | 2 | 7 | 28 | 73 | 229 | 730 | 2,285 | 0 |
| | Nearest Individual = | 20 | | | | | | | | | | | | Sum = | 13 |

References 1, 3, 4

* Score = 20 if the Nearest Individual is within $\frac{1}{8}$ mile of a source; score = 7 if the Nearest Individual is between $\frac{1}{8}$ and $\frac{1}{4}$ mile of a source.

## SI TABLE 23 (HRS TABLE 6-18): AIR PATHWAY VALUES FOR WETLAND AREA

| Wetland Area | Assigned Value |
|---|---|
| < 1 acre | 0 |
| 1 to 50 acres | 25 |
| > 50 to 100 acres | 75 |
| > 100 to 150 acres | 125 |
| > 150 to 200 acres | 175 |
| > 200 to 300 acres | 250 |
| > 300 to 400 acres | 350 |
| > 400 to 500 acres | 450 |
| > 500 acres | 500 |

## SI TABLE 24: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS

| Distance | Distance Weight | Sensitive Environment Type and Value (from SI Tables 13 and 20) | | Product |
|---|---|---|---|---|
| On a Source | 0.10 | x | | |
| | | x | | |
| 0 to 1/4 mile | 0.025 | x | | |
| | | x | | |
| | | x | | |
| 1/4 to 1/2 mile | 0.0054 | x | | |
| | | x | | |
| | | x | | |
| 1/2 to 1 mile | 0.0016 | x | Alligator 75 | 1.2 |
| | | x | Snake 75 | 1.2 |
| | | x | | |
| 1 to 2 miles | 0.0005 | x | | |
| | | x | | |
| | | x | | |
| 2 to 3 miles | 0.00023 | x | | |
| | | x | | |
| | | x | | |
| 3 to 4 miles | 0.00014 | x | | |
| | | x | | |
| | | x | | |
| > 4 miles | 0 | x | | |

Total Environments Score = 2.4

## AIR PATHWAY (concluded)

WASTE CHARACTERISTICS

| | |
|---|---|
| 9. If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculated HWQ score for sources available to air migration. | 10 |
| 10. Assign the highest air toxicity/mobility value from SI Table 21. | 2 |
| 11. Multiply the air pathway toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: | WC = 2 |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

AIR PATHWAY SCORE: $\frac{LE \times T \times WC}{82,500}$ **0.16** (maximum of 100)

| SITE SCORE CALCULATION | S | $S^2$ |
|---|---|---|
| GROUND WATER PATHWAY SCORE ($S_{GW}$) | 0.4 | 0.16 |
| SURFACE WATER PATHWAY SCORE ($S_{SW}$) | 0.3 | 0.9 |
| SOIL EXPOSURE ($S_S$) | 0.04 | 0.016 |
| AIR PATHWAY SCORE ($S_A$) | 0.16 | 0.03 |
| SITE SCORE $\sqrt{\frac{S_{GW}^2+S_{SW}^2+S_S^2+S_A^2}{4}}$ = | | 0.52 |

COMMENTS

- The groundwater to surface water pathway was not scored due to the depth of the aquifer and the low groundwater pathway score.

- A flood frequency of 1:100 was assumed due to the lack of published flood information.

Reference 1

# SITE INVESTIGATION REPORT

# WOOLFOLK CHEMICAL WORKS - LENOX WAREHOUSE

# LENOX, GEORGIA

# GAD082832841

Jeffrey M. Williams
Remedial Action Unit
Georgia Environmental Protection Division
February 1985

WOOLFOLK CHEMICAL WORKS - LENOX WAREHOUSE

SITE INVESTIGATION REPORT

TABLE OF CONTENTS


1.0 Executive Summary.....1

2.0 Background.....3

2.1 Location.....3
2.2 Site Layout.....3
2.3 Ownership History.....3
2.4 Site Use History.....3
2.5 Permit and Regulatory History.....4
2.6 Remedial Actions to Date.....4
2.7 Summary Trip Report.....5

3.0 Environmental Setting.....6

3.1 Topography.....6
3.2 Surface Waters.....6
3.3 Geology and Soils.....6
3.4 Ground Water.....7
3.5 Climate and Meteorology.....8
3.6 Land Use.....8
3.7 Population Distribution.....8
3.8 Water Supply.....8
3.9 Critical Environments.....9

4.0 Waste Types and Quantities.....10

4.1 Waste Quantities.....10
4.2 Waste Disposal Methods and Locations.....10
4.3 Waste Types.....10

5.0 Laboratory Data.....11

5.1 Summary.....11
5.2 Quality Assurance Review.....11

6.0 Toxicology/Chemical Characteristics.....12

WOOLFOLK CHEMICAL WORKS - LENOX WAREHOUSE

SITE INVESTIGATION REPORT

LIST OF FIGURES AND APPENDICES

Figure 1: Site Location.....13

Figure 2: Sample Location Areas.....14

Figure 3: Soil Profile of Site Area.....15

Figure 4: Cook County Map.....16

Table 3.1: Groundwater Quality for City of Adel.....17

Appendix A: Photographs.....18

Appendix B: Laboratory Data.....23

Appendix C: References.....26

Appendix D: Site Inspection Form 2070-13.....27

Appendix E: Inventory Report - Woolfolk Chemicals - Lenox Warehouse.....41

## 1.0 EXECUTIVE SUMMARY

Woolfolk Chemicals - Lenox Warehouse is located in Lenox, Georgia and is composed of 1½ acres of land approximately 1 mile west of Brushy Creek. The warehouse had been a distribution point for a wide variety herbicide and pesticide products from 1976 to 1981 (Appendix E).

In July 1981, a chemical fire at the facility prompted Georgia EPD personnel to respond and supervise the cleanup of the residual materials. Subsequent remedial action by the company removed damaged materials which were transported to a disposal facility in Emelle, Alabama. The owner of the site, Mr. Bobby Lindsey, requested EPD officials to investigate the initial remedial actions at the site.

On August 8, 1984, a site inspection was conducted by Thomas M. Westbrook of the Georgia EPD. A total of four soil samples were collected from areas surrounding the warehouse that were known to receive contaminated wash water from the 1981 chemical fire (Figure 2).

Analysis of the soil samples indicates that there are no leachable contaminants present and the samples are not considered hazardous from the stand point of EP toxicity for toxaphene. Toxaphene values (total concentrations, reported as ppm (mg/kg) dry weight of soil) indicate the presence of this substance in the local environment.

The entire site is located in a residential urban setting with residences present on 3 adjacent sides of the warehouse property. Public access to the site is unrestricted. Surface run-off appears to be the only pathway for contamination to spread, although the extent of contamination is unknown. It is therefore suggested that an assessment study be proposed and implemented to properly evaluate the migration potential of contaminants off the site.

## 2.0 BACKGROUND

### 2.1 Location

Woolfolk Chemical - Lenox Warehouse is located at the intersection of Rentz Avenue and East Colquitt Street, Lenox, Georgia. The site is at latitude 31° 16' 17.0" N and longitude 83° 27' 45.0" W on the Lenox quadrangle 7.5 minute series, USGS map (Figure 1).

### 2.2 Site Layout

The site consists of a 1½ acre tract of land located within the city of Lenox, Georgia, in a residential area. The warehouse building on the site is bordered on the south and east by drainage ditches (Figure 2). Access to the front of the warehouse is from Rentz Avenue.

### 2.3 Ownership History

The facility was originally owned by Mr. D. L. Harpe of Tifton, Georgia. In 1973, the facility was purchased by Bobby Lindsey, who used the facility for a cotton warehouse operation. In the spring of 1976, Mr. Lindsey leased the warehouse building to Woolfolk Chemical Works, Inc. From 1976 to 1981, Woolfolk used the warehouse as a distribution and storage facility for a wide variety of herbicide and pesticide (Agricultural) products. Mr. Lindsey was also employed with Woolfolk Chemical Works from 1976 to 1981.

### 2.4 Site Use History

As stated in section 2.3, from the spring of 1976 to July 1981, the facility was used to store various pesticide and herbicide products.

A fire occurred at the facility on July 1, 1981 after which all wastes were shipped to Chemical Waste Management, Emelle, Alabama, and all salvageable products were removed from the building. No products were subsequently stored on the property.

## 2.5 Permit Regulatory History

Woolfolk Chemicals - Lenox Warehouse has never been required to obtain a permit for the storage of agrichemical products. This facility was a distribution point for Woolfolk Chemicals agricultural products.

## 2.6 Remedial Actions to Date

Personnel from the Georgia Environmental Protection Division first visited the facility in July 1981 in response to a chemical fire on July 1, 1981. A quantity of water used to fight the fire carried some chemicals down a city drainage ditch approximately 0.3 miles from the warehouse. Woolfolk Chemical Works, Inc. contracted with O. H. Materials Company to clean up the chemical spill in the warehouse floor and in the ditches surrounding the warehouse. Wash waters were analyzed before and after filtration to ensure no (future) contamination of soil and water downstream from the facility. On July 31, 1981, approximately 200 cubic yards of residual materials from the Lenox Warehouse fire were shipped to Chemical Waste Management in Emelle, Alabama. The fire fighting waters were treated to remove excessive amounts of toxaphene; however, ditch soils and soils around the building may still be contaminated with residual toxaphene concentrations.

## 2.7 Summary Trip Report

On July 1, 1981, Larry Rogers of the Southwest Georgia Region EPD investigated a chemical fire at the Woolfolk Chemical Works, Inc., Lenox, Georgia. Four samples of the runoff waters from the fire were analyzed for toxaphene and parathion. Ed Cook from the Georgia EPD Emergency Response Team delivered the samples to the GA EPD lab in Atlanta on July 6, 1981 (Appendix B). On July 1, 1981, O. H. Materials Company was contracted for cleanup of approximately 3,000 gallons of contaminated water.

On July 6, 1984, Jennifer Kaduck of the Georgia EPD Facilities Compliance Unit reviewed the files on the cleanup activities at the subject site. The record does not indicate if the warehouse and surrounding soils were ever reinspected to ensure that all wastes were removed. On August 8, 1984, Thomas Westbrook of the Georgia EPD Remedial Action Unit was instructed to inspect and sample the soil areas that may contain high levels of toxaphene. Three soil samples were taken: #1 from the back door, #2 from the front door, and #3 from under the crack in the cement foundation (Appendix A, Photograph 2).

## 3.0 ENVIRONMENTAL SETTING

### 3.1 Topography

Woolfolk Chemicals - Lenox Warehouse is located in the southern central coastal plain area of Georgia. The site is located approximately 1 mile from Brushy Creek at an elevation of 290 feet above mean sea level. Numerous ponds and streams are prevalent throughout the county as a result of the poorly drained plateaus and low lying plains[1] (Figure 1).

The terrain at the site is nearly level. The site is bordered on the south and east sides by storm drainage ditches that are adjacent to the warehouse building (Figure 2). These ditches merge at the southeast corner of the site where they eventually drain some residential sections of the city.

### 3.2 Surface Waters

The New and Withlacoochee Rivers form the eastern boundary of Cook County and the Little River forms the western boundary. Brushy Creek is the closest surface water body near the site (Figure 1). There are no upstream contributing waters or downstream receiving waters near the site. There is presently no information available in reference to the flood potential of the area. There is no stream classification and surface water quality data for Cook County.

### 3.3 Geology and Soils

Soil at the facility is represented by the Leefield series, which consists of somewhat poorly drained soils that have formed in thick beds of loamy material on low uplands.[1]

Soils at the site are low in natural fertility and are very strongly acid throughout.[1] Permeability is moderately slow. The Leefield loamy sand is the dominant soil type at the site and represents a somewhat poorly drained soil. The soils are derived mainly from the Hawthorne Formation, a geologic sedimentary deposit laid down in Miocene times. Cook County has flat terrain, and consequently has extensive ponds and bay areas that result in poor drainage. Top soil is sandy to a depth of 6 inches with a seasonal high water table that is 15 to 30 inches for 2 to 4 months of the year.[1] Loamy sand is found from 0-26 inches, sandy loam from 26-31 inches and sandy clay loam from 31-65 inches.[1] Sand, clay, and limestones of the Miocene age are found at depths from 25 to 400 feet. From 400 to 500 feet - the Ocala limestone occurs and is used as the main water bearing unit for the city of Lenox.[2]

3.4 Ground Water

The primary source of water for the Lenox, Georgia area is the principal artesian aquifer. The city of Lenox has two deep water wells that provide drinking water for approximately 966 people.[3] The main water bearing zone consists of the Ocala Limestone and undifferentiated limestones of the Oligocene age.[4] The overlying Miocene series consists of sediments that contain mostly sand and clay with limestone occuring at about 350 feet below land surface. Thickness of the Ocala Limestone at the site is about 173 feet and yields approximately 250 gallons per minute for each of the two municipal deep water wells. Increased precipitation and stream flow in winter and early spring cause high ground water levels. Decreased precipitation and increased evapotranspiration in summer and autumn result in low stream flow and low groundwater levels.[5]

Ground water quality for the city of Adel is given in Table 3.1. Direction of flow is generally south to southeast for the ground water in the principal artesian aquifer.

3.5 Climate and Meteorology

The climate of Cook County and the Lenox area is characterized by hot humid summers and mild winters. The average annual rainfall is almost 50 inches. The main climatic influences are the latitude, and the warm waters of the Gulf of Mexico. Fall has less rain and wind than spring with average annual temperature of 67°F.[1]

3.6

Land Use

The site is located within the city limits of Lenox in a residential urban setting. U.S. Census statistics in 1969 estimated 70 percent of Cook County was used for farming. Land usage is generally restricted to agricultural products but industry is gaining importance.[1]

3.7

About 55 percent of the population is rural in Cook County. The population within the town of Lenox is 965. The number of residents in the town that use the ground water from the two city wells is 965.[3]

3.8 Water Supply

All drinking water within the city of Lenox is pumped from two municipal wells that penetrate the principal artesian aquifer. One well is located at the

intersection of Gray Street and Haze Road and the second well is on Broad Street in the city of Lenox (Figure 1). Approximately 90,000 gallons per day or 32,850,000 gallons per year are metered by the city of Lenox.[3]

### 3.9 Critical Environments

The site is located within 1 mile of Brushy Creek. This creek is the closest body of water to the subject site. There is an extensive floodplain area approximately 4½ to 5 miles east of the site on the New River (Figure 3). There are numerous small fresh water ponds and bays south of the site. Drainage at the site is poor and generally follows a southeasterly course toward Brushy Creek. Contamination of the creek area has not taken place in previous spills around the site due to the poor drainage at the site. The alluvial floodplains of the New River are habitats for the American Alligator and Indigo Snake, both on the Federal Endangered Species List.[5-6]

## 4.0 WASTE TYPES AND QUANTITIES

### 4.1 Waste Quantities

From 1976 to July 1981, Lenox - Woolfolk Chemical Warehouse operated a warehouse distribution center for agrichemical products. A complete inventory of products before the July 1, 1981 fire is listed in Appendix E. No waste was ever generated at the site. There was however a chemical fire on July 1, 1981 in which a release into the environment was observed. Soils surrounding the warehouse building were sampled by Georgia EPD personnel in August 1984 and determined to contain high levels of the compound toxaphene (Appendix B). The quantity of contaminated soil at the site has not been estimated because the extent of contamination is unknown.

### 4.2 Waste Disposal Methods and Locations

All waste waters used in fighting the July 1981 fire were decontaminated by a carbon filtration process. Elevated levels of toxaphene were found in soils at the entrance and exit of the warehouse building (Figure 1).

### 4.3 Waste Types

Georgia EPD lab analyses of the soils around the site revealed excessive quantities of the pesticide toxaphene. Appendix E lists the types of compounds present in the warehouse before the July 1981 fire.

## 5.0 LABORATORY DATA

### 5.1 Summary

On August 8, 1984, Thomas M. Westbrook of the Georgia EPD Remedial Action Unit, took three soil samples at the subject site (Figure 2). Toxaphene was the only parameter reported because the high concentrations masked the identification of other constituents. The toxaphene found in the three samples was evaluated for its leachability into water. There is a maximum EP concentration limit of 500 ppb (ug/L) for toxaphene. According to the August 8, 1984 lab report the samples are not considered hazardous from the standpoint of EP toxicity for toxaphene.

Toxaphene values were also reported as ppm or mg/kg of dry weight of soil. These values represent "total" concentrations. According to CERCLA and the lab analysis it is believed that a reportable quantity of substance has been released into the environment.

### 5.2 Quality Assurance Review

All samples were collected and placed in clean mason jars with an aluminum foil seal inside the lid. All samples were placed on ice until delivery to the EPD lab. EPD lab is covered by an approved QA document.

## 6.0 TOXICOLOGICAL/CHEMICAL CHARACTERISTICS

From the four soil samples collected on August 8, 1984, the following substance has been identified at the site:

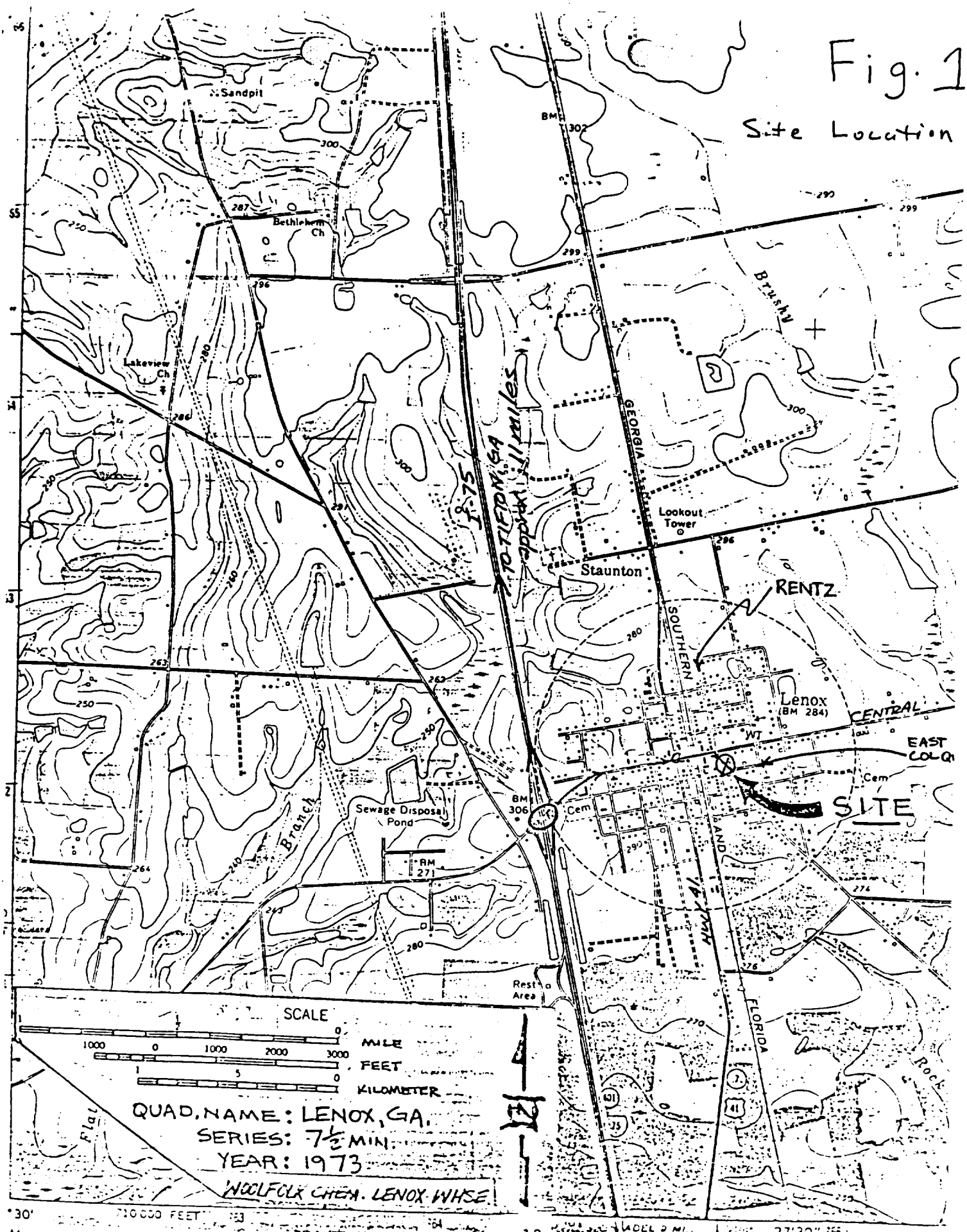
Toxaphene - $C_{10}H_{10}Cl_8$ - an amber, waxy solid with a mild odor of chlorine and camphor. Toxic by ingestion, inhalation, and skin absorption.

Oral $LD_{<0}$ (human) = 40 mg/kg, Oral $LD_{50}$ (rat) = 60 mg/kg, and Dermal $LD_{50}$ (rat) = 780 mg/kg.

Lethal oral dose for man is estimated at 2-7 g, a toxicity of about four times that of DDT.

Other compounds that are expected, but not confirmed, to be present at the site are chlordane, parathion, and lindane.

All toxicological data is taken from references 7 and 8.




Mapped, edited, and published by the Geological Survey

Control by USGS, NOS/NOAA, and Canada Geodetic Survey

Fig. 2
Sample Location Areas

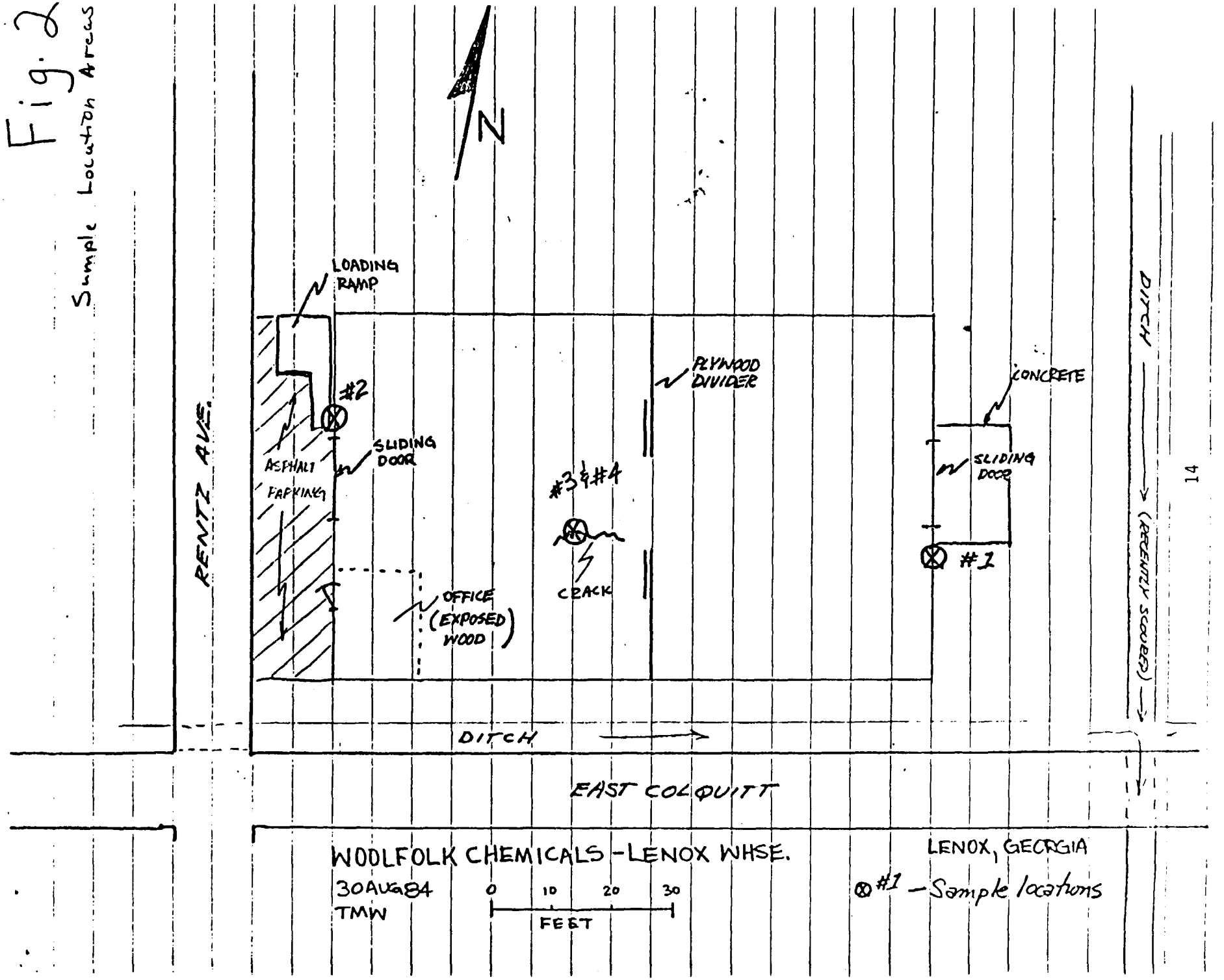


Fig 3

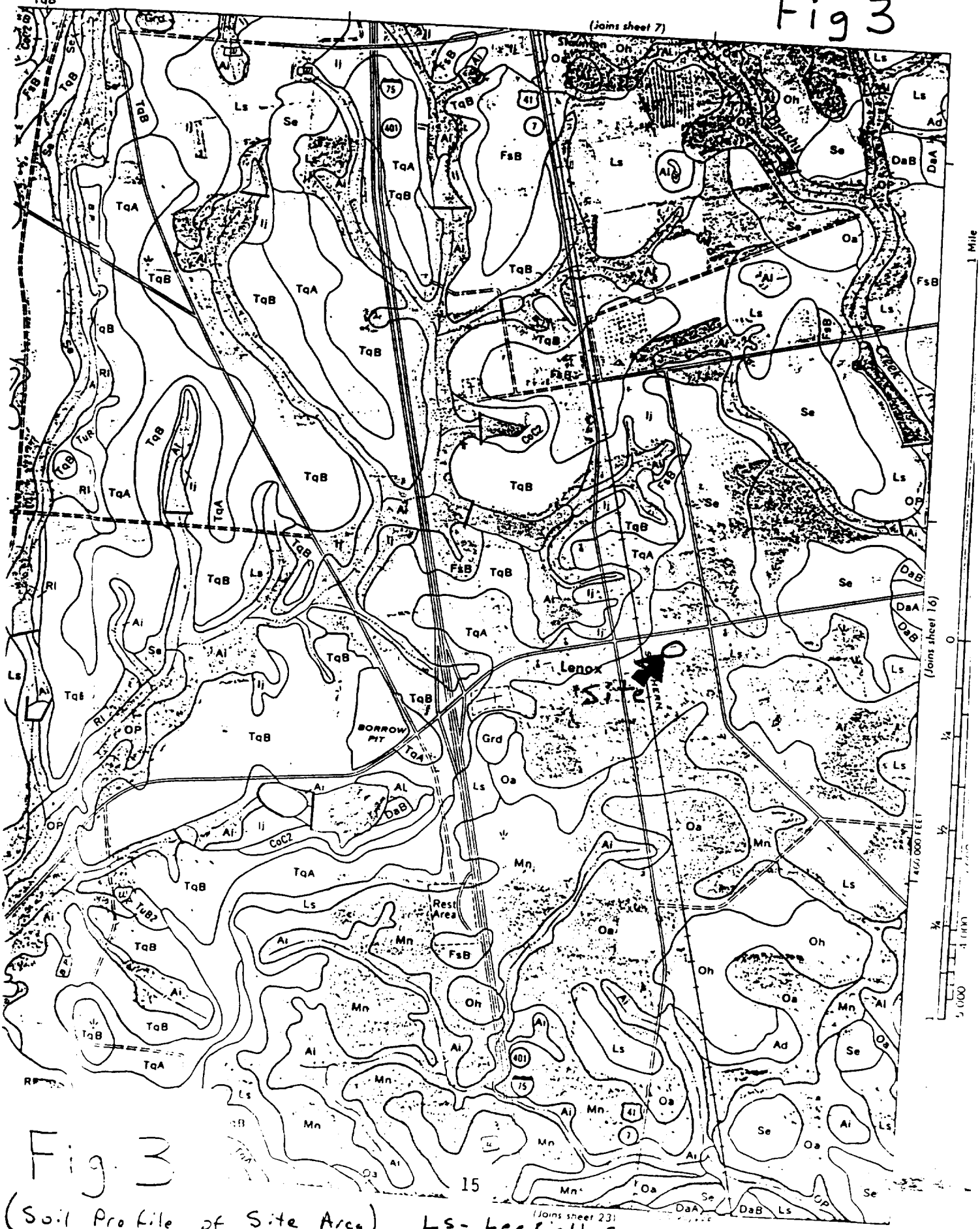



Fig 3

(Soil Profile of Site Area) Ls- Leefield Series

# INDEX TO MAP SHEETS
## COLQUITT AND COOK COUNTIES, GEORGIA

Scale 1:253,440

1 0 1 2 3 4 Miles

Fig. L

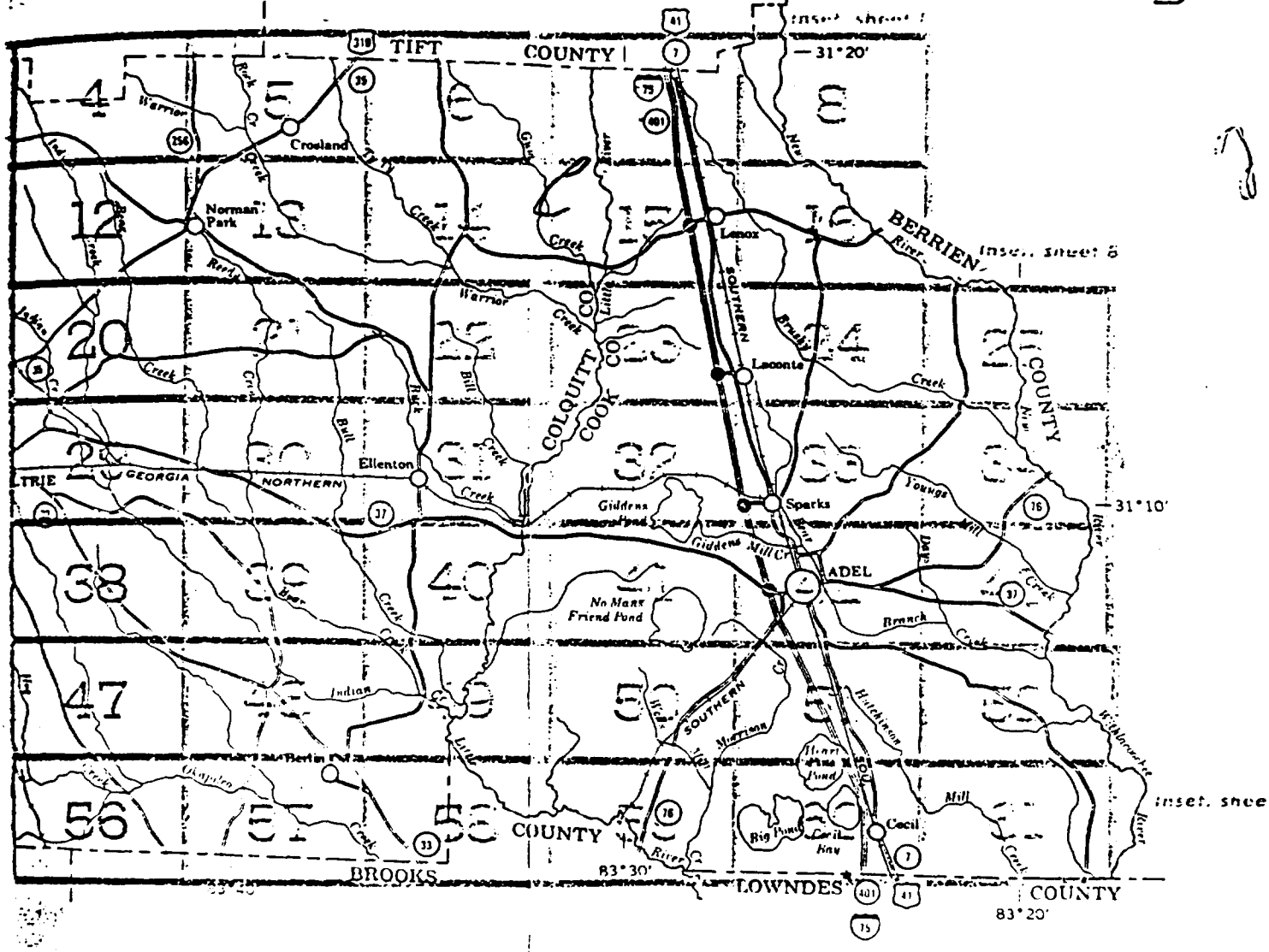


Table 3.1

Location: Adel, Cook County
Owner: Municipal
Well No.: City Well 4
Date drilled: June, 1957
Yield: 1,200 gpm

G.G.S. No.: --

Color: 2
Temperature (°F): 71
Date of collection: April 18, 1958

pH: 7.7
Specific conductance (micromhos 25°C): 399

| Constituents | Parts per million | Equivalents per million |
|---|---|---|
| Silica ($SiO_2$) | 33 | |
| Iron (Fe) | .26 | |
| Calcium (Ca) | 53 | 2.64 |
| Magnesium (Mg) | 16 | 1.32 |
| Sodium (Na) | 4.6 | .20 |
| Potassium (K) | 1.4 | .04 |
| Bicarbonate ($HCO_3$) | 144 | 2.36 |
| Carbonate ($CO_3$) | 0 | .00 |
| Sulfate ($SO_4$) | 87 | 1.81 |
| Chloride (Cl) | 4.0 | .11 |
| Fluoride (F) | .3 | .02 |
| Nitrate ($NO_3$) | .1 | .00 |
| Dissolved solids | 289 | |
| Hardness as $CaCO_3$ | | |
| Total . . . . . | . . 198 | |
| Noncarbonate . . . . . | . . 80 | |

| Casing record | | | | | Aquifer |
|---|---|---|---|---|---|
| Size (inches) | From (feet) | To (feet) | Depth of well (feet) | Screen setting (feet) | |
| 16 | 0 | 46 | | | |
| 12 | 46 | 276 | 500 | 276-500 a/ | Ocala limestone |

a/ Open hole in limestone

Appendix A

8AUG84 #1
LENOX

County Name Cook
Picture No 1 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing "E"
Photographer T WESTBROOK
Program 3012
Explanation: INSIDE VIEW OF WOOLFOLK CHEM. - LENOX WHSE

Other:

8AUG84 #2
LENOX

County Name Cook
Picture No 2 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing "E"
Photographer T. WESTBROOK
Program 3012
Explanation: CLOSE-UP OF CRACK IN CONCRETE FOUNDATION

Other: 1981 FIRE CENTERED IN THIS AREA OF THE WAREHOUSE.

8AUG84 #3
LENOX

County Name COOK
Picture No 3 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing SE
Photographer T. WESTBROOK
Program 3012
Explanation: S.E. CORNER OF WHSE. EMPTY DRUMS (EXCESS) FROM CLEANUP.

Other:

8AUG84 #4
LENOX

County Name COOK
Picture No 4 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing —
Photographer T. WESTBROOK
Program 3012
Explanation: CLOSESUP OF SAMPLE LOCATIONS #3, #4.

Other: NOTE - PLASTIC LINER (FOLDED) UNDER SLAB

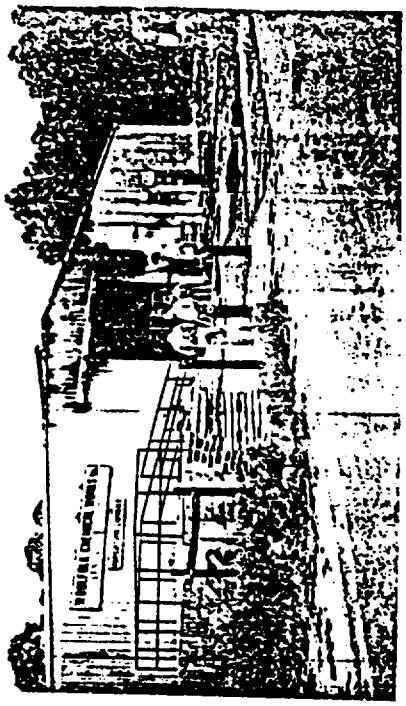
8AUG84 #5
LENOX

County Name COOK
Picture No 5 of 5
Site Name LENOX WHSE.
Date 8AUG84 Weather CLEAR
Direction Facing —
Photographer TWESTBROOK
Program 3012
Explanation: 2ND ATTEMPT OF OBTAINING SAME BUT CLEARER PHOTO AS #4

Other:

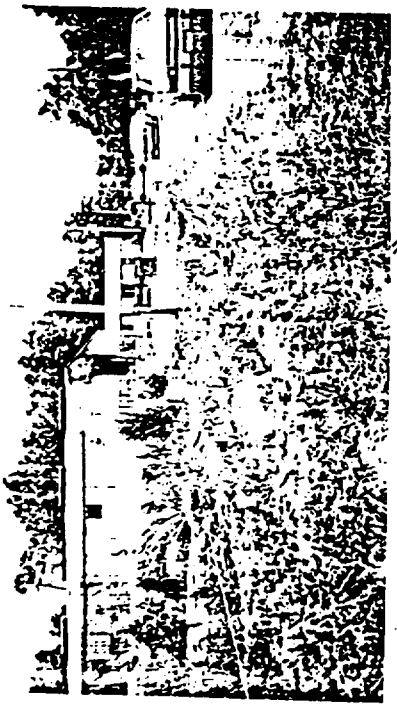
County Name
Picture No of
Site Name
Date Weather
Direction Facing
Photographer
Program
Explanation:

Other:



#1

#2



#3

#4

#5

Woolfolk Chem Co
Lenox. 7-1-81
2051 hr
Picture shows building
+ Security Line around area
Larry Rogers #3

POLACOLOR 2 K015251P

7-1-81 1055
Woolfolk Chem Co Lenox
Front entrance.
taken by Larry Rogers
#1

7-1-81 11:00 Am.
Woolfolk Chem Co Lenox Ga
Right side of building + ditch
with runoff water
Larry Rogers
#4

POLACOLOR 2 K015251P

Woolfolk Chemical Co.
Lenox, Ga.
Back door of building
Water ran out here
during fire + carried
chemicals down into
ditch.
#2 Larry Rogers

Lenox, Ga
ditch with water taken with
chemicals,
#5
Larry Rogers

POLACOLOR 2 K015251P

22

Appendix

# LAND PROTECTION BRANCH
## HAZARDOUS WASTE ANALYSIS REQUEST

DATE: 9AUG84 PROJECT: 3012 PROGRAM WOOLFOLK-LENOX W.HSE. COLLECTOR: T. WESTBROOK

NO. SAMPLES: 3 LOG NOS. 924-926 LIQUID ____ SOLID ____ SOIL 3

CAUSTIC ____ ACID ____ SOLVENT ____ UNKNOWN ____ SLUDGE ____

INFORMATION FOUND: File info: Fire in Agchem warehouse resulted in spillage & mixtures of various pesticides & herbicides with water. Soils outside w. hse. potent. contaminated.

HAZARDOUS WASTE NOS. Toxaphene – CAS 8001-35-2, Parathion - CAS 56-38-2, Chlordane 57

HAZARDOUS HANDLING: assume contaminated - odors were evident

WORK PRIORITY (CRITICAL NEED) NORMAL - ROUTINE - Moderate - LL Project

### METALS ANALYSES

| | TOT | DIS | | |
|---|---|---|---|---|
| METALS (DW NO Hg) | ☐ | ☐ | EP METALS (DW NO Hg) ☐ | 100X ☐ 30X ☐ |
| METALS (DW WITH Hg) | ☐ | ☐ | EP METALS (DW WITH Hg) | EP Toxaphene X |

| | TOT | DIS | | TOT | DIS | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NICKEL | ☐ | ☐ | CADMIUM | ☐ | ☐ | EP NICKEL | ☐ | EP CADMIUM | ☐ |
| ARSENIC | ☐ | ☐ | LEAD | ☐ | ☐ | EP ARSENIC | ☐ | EP LEAD | ☐ |
| CHROMIUM | ☐ | ☐ | MERCURY | ☐ | ☐ | EP CHROMIUM | ☐ | EP MERCURY | ☐ |
| CHROM-HEX | ☐ | ☐ | SELENIUM | ☐ | ☐ | EP CHROM-HEX | ☐ | EP SELENIUM | ☐ |
| ____ | ☐ | ☐ | ____ | ☐ | ☐ | ____ | ☐ | ____ | ☐ |

### SPECIFIC ANALYSES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| pH | ☐ | SULFIDE | ☐ | % SOLIDS | ☐ | ____ | ☐ |
| FLASH PT | ☐ | SP.COND. | ☐ | TOT. PHENOLS | ☐ | ____ | ☐ |
| CYANIDE TOT. | ☐ | TOC | ☐ | CHLORIDE | ☐ | ____ | ☐ |
| CYANIDE AM. | ☐ | TOH | ☐ | FLUORIDE | ☐ | ____ | ☐ |

RECEIVED SEP 19 1984 REMEDIAL ACTIONS UNIT

### ORGANIC ANALYSES

| | | | |
|---|---|---|---|
| PESTICIDE SCREEN (EC) | ☒ | GC-MS ACID EXTRACTABLES | ☐ |
| PCB | ☐ | GC-MS BASE/NEUTRALS | ☐ |
| VOLATILE ORGANICS (VOA) | ☐ | other suspect | |

SPECIFIC ORGANICS: ~~Toxaphene, Chlordane~~, Parathion & DDT

~~(in order of importance)~~

APPROVED: [illegible] SFM 8/10 AUTHORIZED: [illegible]



HW/0089F

GEORGIA ENVIRONMENTAL PROTECTION DIVISION

LABORATORY REPORT

SAMPLE DATE: 8AUG84 PROJECT: WOOLFOLK-LENOX W.HSE. COLLECTOR: T. WESTBROOK

DATE REC'D: 8/10/84

TIME REC'D: 1508

REC'D BY: D. Reed

DEL BY: T. WESTBROOK

Harold Langford
LABORATORY MANAGER

DATE:

| HW LOG NO. | 924 | 925 | 926 | | |
|---|---|---|---|---|---|
| LABEL | WOOLFOLK-LENOX #1 (BACKDOOR) | WOOLFOLK-LENOX #2 (Front Door) | WOOLFOLK-LENOX #3 (Under slab) | | |
| PARAMETERS / LAB NO. | | | | | |
| Toxaphene ms/kg dry | 984 | 6260 | 3080. | | |
| EP Toxaphene ug/l | <40 | <40 | <40 | | |

REMARKS:

GEORGIA ENVIRONMENTAL PROTECTION DIVISION
LAND PROTECTION BRANCH

CHAIN OF CUSTODY

FACILITY: WOOLFOLK - LENOX W. HSE. LOCATION: Lenox, Ga. Rentz St.

| SAMPLE # | LOG # | LAB I.D. | DESCRIPTION | COLLECTED BY (Name) | DATE | TIME |
|---|---|---|---|---|---|---|
| #1 | | | WOOLFOLK-LENOX #1 SOILS (BACKDOOR) | T. WESTBROOK | 8AUG84 | 1:30 PM |
| #2 | | | WOOLFOLK-LENOX #2 SOILS (FRONT DOOR) | T. WESTBROOK | 8AUG84 | 1:00 PM |
| #3 | | | WOOLFOLK-LENOX #3 SOILS. (under slab) | T. WESTBROOK | 8AUG84 | 2:00 PM |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

TRANSFER RECORD

| TRANSFERRED BY (Name) | TO (Name) (IF FINAL: Lab Name) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (Name) | DATE |
|---|---|---|---|---|---|---|
| T. Westbrook | FINAL-EPD Lab | 10AUG84 | 1508 | Physical | Danny Reid | 8/10/84 |
| | | | | | | |
| | | | | | | |

ANALYSES REQUESTED: Pesticide Scan

## APPENDIX C

## REFERENCES


1. Soil Survey of Colquitt and Cook Counties, Georgia: U.S. Department of Agriculture, Soil Conservation Service, 1975.

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EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 1 - SITE LOCATION AND INSPECTION INFORMATION**

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. SITE NAME AND LOCATION**

| 01 SITE NAME (Legal, common, or descriptive name of site) | 02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER |
|---|---|
| Woolfolk Chemical - Lenox Warehouse | Rentz Avenue and East Colquitt |

| 03 CITY | 04 STATE | 05 ZIP CODE | 06 COUNTY | 07 COUNTY CODE | 08 CONG DIST |
|---|---|---|---|---|---|
| Lenox | GA | 31637 | Cook | 075 | 2 |

| 09 COORDINATES LATITUDE | LONGITUDE | 10 TYPE OF OWNERSHIP (Check one) |
|---|---|---|
| 31° 16' 17.0" | 083° 27' 45.0" | ☒ A. PRIVATE ☐ B. FEDERAL ____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ____ ☐ G. UNKNOWN |

**III. INSPECTION INFORMATION**

| 01 DATE OF INSPECTION | 02 SITE STATUS | 03 YEARS OF OPERATION |
|---|---|---|
| 8 8 84 (MONTH DAY YEAR) | ☐ ACTIVE ☒ INACTIVE | 1976 (BEGINNING YEAR) 1981 (ENDING YEAR) ___ UNKNOWN |

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ____ (Name of firm)
☒ E. STATE ☐ F. STATE CONTRACTOR GA EPD (Name of firm) ☐ G. OTHER ____ (Specify)

| 05 CHIEF INSPECTOR | 06 TITLE | 07 ORGANIZATION | 08 TELEPHONE NO. |
|---|---|---|---|
| Thomas M. Westbrook | Environmental Specialist | GA EPD | (404) 656-7404 |

| 09 OTHER INSPECTORS | 10 TITLE | 11 ORGANIZATION | 12 TELEPHONE NO. |
|---|---|---|---|
| Jeffrey M. Williams | Environmental Specialist | GA EPD | (404) 656-7404 |
| | | | ( ) |
| | | | ( ) |
| | | | ( ) |
| | | | ( ) |

| 13 SITE REPRESENTATIVES INTERVIEWED | 14 TITLE | 15 ADDRESS | 16 TELEPHONE NO |
|---|---|---|---|
| Bobby Lindsey | Owner | 103 Magnolia Drive | (912) 386-4300 |
| | | P. O. Box 1809 | ( ) |
| | | Tifton, GA 31794 | ( ) |
| | | | ( ) |
| | | | ( ) |
| | | | ( ) |
| | | | |

| 17 ACCESS GAINED BY (Check one) | 18 TIME OF INSPECTION | 19 WEATHER CONDITIONS |
|---|---|---|
| ☒ PERMISSION ☐ WARRANT | 12:00 p.m. | Clear/sunny |

**IV. INFORMATION AVAILABLE FROM**

| 01 CONTACT | 02 OF (Agency/Organization) | 03 TELEPHONE NO. |
|---|---|---|
| Mr. Bobby Lindsey | Owner | (912) 386-4300 |

| 04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM | 05 AGENCY | 06 ORGANIZATION | 07 TELEPHONE NO. | 08 DATE |
|---|---|---|---|---|
| Jeffrey M. Williams | GA DNR | EPD RAU | 656-7404 | / / (MONTH DAY YEAR) |

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 2 - WASTE INFORMATION

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS**

01 PHYSICAL STATES (Check all that apply)

- [X] A. SOLID
- [X] B. POWDER FINES
- [ ] C. SLUDGE
- [ ] D. OTHER _____ (Specify)
- [ ] E. SLURRY
- [ ] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS Unknown
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [X] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

**III. WASTE TYPE**

| CATEGORY | SUBSTANCE NAME | 01 GROSS AMOUNT | 02 UNIT OF MEASURE | 03 COMMENTS |
|---|---|---|---|---|
| SLU | SLUDGE | | | |
| OLW | OILY WASTE | | | |
| SOL | SOLVENTS | | | |
| PSD | PESTICIDES | Unknown | Unknown | Waste is toxaphene contaminated |
| OCC | OTHER ORGANIC CHEMICALS | | | soil. Amount is unknown because |
| IOC | INORGANIC CHEMICALS | | | extent of contamination is |
| ACD | ACIDS | | | unknown |
| BAS | BASES | | | |
| MES | HEAVY METALS | | | |

**IV. HAZARDOUS SUBSTANCES** (See Appendix for most frequently cited CAS Numbers)

| 01 CATEGORY | 02 SUBSTANCE NAME | 03 CAS NUMBER | 04 STORAGE/DISPOSAL METHOD | 05 CONCENTRATION | 06 MEASURE OF CONCENTRATION |
|---|---|---|---|---|---|
| PSD | Toxaphene | 8001-35-2 | OD (open dump) | 2.88 | ppm (soil) |

**V. FEEDSTOCKS** (See Appendix for CAS Numbers)

| CATEGORY | 01 FEEDSTOCK NAME | 02 CAS NUMBER | CATEGORY | 01 FEEDSTOCK NAME | 02 CAS NUMBER |
|---|---|---|---|---|---|
| FDS | | | FDS | | |
| FDS | | | FDS | | |
| FDS | | | FDS | | |
| FDS | | | FDS | | |

**VI. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

GA EPD Files and Emergency Response Files
Sample analyses from EPD lab and Cooperative Extension Service Lab in Athens, GA
Cleanup information in the State Files from O. H. Materials File.

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. HAZARDOUS CONDITIONS AND INCIDENTS**

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Potential contamination of Brushy Creek surface waters by runoff from two city drainage ditches that are adjacent to the warehouse building.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☒ OBSERVED (DATE: 8/8/84) — ☐ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: ½ (Acres) — 04 NARRATIVE DESCRIPTION

Soils adjaacent to former warehouse and the surrounding lot are known to have received fire fighting waters containing large concentrations of toxaphene. Further sampling needed to define extent of contamination.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 25 - 50 — 04 NARRATIVE DESCRIPTION

Warehouse lot is open and is in a residential/urban setting, pedestrain traffic is not controlled. Residences are present on 3 adjacent sides of the warehouse lot.

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. HAZARDOUS CONDITIONS AND INCIDENTS** *(Continued)*

01 [X] J. DAMAGE TO FLORA — 02 [X] OBSERVED (DATE: 8/8/84) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

Several areas that apparently received water runoff from the fire in 1981 did not appear to be able to support plant growth in 1984. (Trip Report - T. Westbrook 8/8/84)

01 [ ] K. DAMAGE TO FAUNA — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION *(Include name(s) of species)*

01 [ ] L. CONTAMINATION OF FOOD CHAIN — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] M. UNSTABLE CONTAINMENT OF WASTES *(Spills/Runoff/Standing liquids, Leaking drums)* — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 [X] N. DAMAGE TO OFFSITE PROPERTY — 02 [X] OBSERVED (DATE: 7/1/81) — [X] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

Samples of waters in ditches adjacent to site as a result of fire fighting activities were observed to contain from 10 to 263 ppm (mg/L) of toxaphene. Length of ditch is approximately 0.3 miles.

01 [ ] O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] P. ILLEGAL/UNAUTHORIZED DUMPING — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

Inside the warehouse, plywood and various wood beams remain and appear to have residual contamination. Remnant insulation on ceilings and walls was observed and may contain contaminants.

**III. TOTAL POPULATION POTENTIALLY AFFECTED:** 25-50

**IV. COMMENTS**

As a result of a complaint from the warehouse owner in June 1984, this site has been discovered to ERRIS. Efforts are under way to effect an assessment and remedial action plan.

**V. SOURCES OF INFORMATION** *(Cite specific references, e.g., state files, sample analysis, reports)*

GA State File information
GA EPD Lab analyses of ditch water samples.
Independent lab work on samples taken during cleanup conducted by O.H. Materials.
GA EPD lab analyses of 8/8/84 soil samples.

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION
### PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. PERMIT INFORMATION**

| 01 TYPE OF PERMIT ISSUED (Check all that apply) | 02 PERMIT NUMBER | 03 DATE ISSUED | 04 EXPIRATION DATE | 05 COMMENTS |
|---|---|---|---|---|
| ☐ A. NPDES | | | | |
| ☐ B. UIC | | | | |
| ☐ C. AIR | | | | |
| ☐ D. RCRA | | | | |
| ☐ E. RCRA INTERIM STATUS | | | | |
| ☐ F. SPCC PLAN | | | | |
| ☐ G. STATE (Specify) | | | | |
| ☐ H. LOCAL (Specify) | | | | |
| ☐ I. OTHER (Specify) | | | | |
| ☒ J. NONE | | | | Permit not required |

**III. SITE DESCRIPTION**

| 01 STORAGE/DISPOSAL (Check all that apply) | 02 AMOUNT | 03 UNIT OF MEASURE |
|---|---|---|
| ☐ A. SURFACE IMPOUNDMENT | | |
| ☐ B. PILES | | |
| ☐ C. DRUMS, ABOVE GROUND | | |
| ☐ D. TANK, ABOVE GROUND | | |
| ☐ E. TANK, BELOW GROUND | | |
| ☐ F. LANDFILL | | |
| ☐ G. LANDFARM | | |
| ☒ H. OPEN DUMP | Unknown | |
| ☐ I. OTHER _____ (Specify) | | |

04 TREATMENT (Check all that apply)
- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER
- ☒ A. BUILDINGS ON SITE

100' x 60'

06 AREA OF SITE

1½ (Acres)

07 COMMENTS

Site is located in a poorly drained area that is located within a residential urban setting. Soils at the site are known to contain unknown quantities of toxaphene. Fire fighting waters were treated as a result of a 1981 fire, but soils were not treated.

**IV. CONTAINMENT**

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☒ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

Contamination of soils appear to be contained to the site boundaries. EP toxicity tests show no potential for the contaminant, toxaphene to leach into the soils. Site is bordered by two drainage ditches that may contain contaminated soils.

**V. ACCESSIBILITY**

01 WASTE EASILY ACCESSIBLE: ☒ YES ☐ NO

02 COMMENTS

Warehouse lot is open in a residential setting. Residences are present on 3 adjacent sides of the warehouse lot.

**VI. SOURCES OF INFORMATION** (Cite specific references, e.g. state files, sample analysis, reports)

GA EPD State Files
EPD Site Inspection 8/8/84 - Thomas M. Westbrook

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D082832841 |

**II. DRINKING WATER SUPPLY**

01 TYPE OF DRINKING SUPPLY (Check as applicable)

| | SURFACE | WELL |
|---|---|---|
| COMMUNITY | A. ☐ | B. ☒ |
| NON-COMMUNITY | C. ☐ | D. ☐ |

02 STATUS

| ENDANGERED | AFFECTED | MONITORED |
|---|---|---|
| A. ☐ | B. ☐ | C. ☐ |
| D. ☐ | E. ☐ | F. ☐ |

03 DISTANCE TO SITE

A. ¼ (mi)
B. ¼ (mi)

**III. GROUNDWATER**

01 GROUNDWATER USE IN VICINITY (Check one)

☒ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 960

03 DISTANCE TO NEAREST DRINKING WATER WELL ¼ (mi)

| 04 DEPTH TO GROUNDWATER | 05 DIRECTION OF GROUNDWATER FLOW | 06 DEPTH TO AQUIFER OF CONCERN | 07 POTENTIAL YIELD OF AQUIFER | 08 SOLE SOURCE AQUIFER |
|---|---|---|---|---|
| Unknown (ft) | SSE | 300-400 (ft) | 360,000 (gpd) | ☒ YES ☐ NO |

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

There are two municipal wells located within the city of Lenox, GA. Both wells are 8 inch wells that are approximately 350 feet deep. Well #1 is located at the corner of Gray St. and Haze Rd. Well #2 is located on Broad Street at the water storage tank.

10 RECHARGE AREA

☒ YES ☐ NO

COMMENTS Recharge area for shallow aquifer and to a lesser extent for the Principal Artesian Aquifer.

11 DISCHARGE AREA

☒ YES ☐ NO

COMMENTS Shallow aquifer discharges into the New River.

**IV. SURFACE WATER**

01 SURFACE WATER USE (Check one)

☐ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

| NAME: | AFFECTED | DISTANCE TO SITE |
|---|---|---|
| Brushy Creek | ☐ | ½ (mi) |
| | ☐ | (mi) |
| | ☐ | (mi) |

**V. DEMOGRAPHIC AND PROPERTY INFORMATION**

01 TOTAL POPULATION WITHIN

| ONE (1) MILE OF SITE | TWO (2) MILES OF SITE | THREE (3) MILES OF SITE |
|---|---|---|
| A. 966 NO. OF PERSONS | B. NO. OF PERSONS | C. NO. OF PERSONS |

02 DISTANCE TO NEAREST POPULATION 0.1 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE 330

04 DISTANCE TO NEAREST OFF-SITE BUILDING 0.1 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

Site is located in a residential urban setting with 3 residences located on 3 adjacent sides of the warehouse lot. Site is located in downtown area of city of Lenox within a densely populated area.

EPA FORM 2070-13 (7-81)

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**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

## VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN $10^{-3}$ cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than $10^{-6}$ cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☒ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than $10^{-2}$ cm/sec)

| 03 DEPTH TO BEDROCK | 04 DEPTH OF CONTAMINATED SOIL ZONE | 05 SOIL pH |
|---|---|---|
| 200 (ft) | 1-2 (ft) | 4.5-5.5 |

| 06 NET PRECIPITATION | 07 ONE YEAR 24 HOUR RAINFALL | 08 SLOPE: SITE SLOPE | DIRECTION OF SITE SLOPE | TERRAIN AVERAGE SLOPE |
|---|---|---|---|---|
| (in) | (in) | 0-3 % | SSW | 0-3 % |

09 FLOOD POTENTIAL

SITE IS IN _____ YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

_____ (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

| COMMERCIAL/INDUSTRIAL | RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES | AGRICULTURAL LANDS: PRIME AG LAND | AGRICULTURAL LANDS: AG LAND |
|---|---|---|---|
| A. 0.2 (mi) | B. 0.1 (mi) | C. 1-2 (mi) | D. 0.4 (mi) |

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site is on relatively flat land (300' elevation) approximately ½ to 1 mile from the surface waters of Brushy Creek. Elevations of 240 feet are found about 4 miles east of the site along the New River. Land south of the site is typically laden with ponds and large depressions. Site is located on a topographic high with respect to the immediate and surrounding topography.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Lenox, Georgia 7.5 Minute Topographic map,
USDA-USFS Soil Survey Map of Cook County
Department of Commerce and Flood Insurance Map for Cook County compiled by US Department of Housing and Urban Development.

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 6 - SAMPLE AND FIELD INFORMATION

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. SAMPLES TAKEN**

| SAMPLE TYPE | 01 NUMBER OF SAMPLES TAKEN | 02 SAMPLES SENT TO | 03 ESTIMATED DATE RESULTS AVAILABLE |
|---|---|---|---|
| GROUNDWATER | | | |
| SURFACE WATER | | | |
| WASTE | | | |
| AIR | | | |
| RUNOFF | | | |
| SPILL | | | |
| SOIL | Three | GA EPD lab | attached |
| VEGETATION | | | |
| OTHER | | | |

**III. FIELD MEASUREMENTS TAKEN**

| 01 TYPE | 02 COMMENTS |
|---|---|
| | |
| | |
| | |
| | |
| | |

**IV. PHOTOGRAPHS AND MAPS**

01 TYPE ☐ GROUND ☐ AERIAL

02 IN CUSTODY OF _____ (Name of organization or individual)

03 MAPS
X YES
☐ NO

04 LOCATION OF MAPS
Sketch map in report (Figure 2)

**V. OTHER FIELD DATA COLLECTED** (Provide narrative description)

**VI. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

Trip Report - 8/8/84 - Thomas M. Westbrook - GA EPD

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 7 - OWNER INFORMATION

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

## II. CURRENT OWNER(S)

| 01 NAME | 02 D+B NUMBER |
|---|---|
| Mr. Bobby Lindsey | |

| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
|---|---|
| 103 Magnolia Drive,PO Box 1809 | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| Tifton | GA | 31794 |

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

## PARENT COMPANY (If applicable)

| 08 NAME | 09 D+B NUMBER |
|---|---|
| | |

| 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | 11 SIC CODE |
|---|---|
| | |

| 12 CITY | 13 STATE | 14 ZIP CODE |
|---|---|---|
| | | |

| 08 NAME | 09 D+B NUMBER |
|---|---|
| | |

| 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | 11 SIC CODE |
|---|---|
| | |

| 12 CITY | 13 STATE | 14 ZIP CODE |
|---|---|---|
| | | |

| 08 NAME | 09 D+B NUMBER |
|---|---|
| | |

| 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | 11 SIC CODE |
|---|---|
| | |

| 12 CITY | 13 STATE | 14 ZIP CODE |
|---|---|---|
| | | |

| 08 NAME | 09 D+B NUMBER |
|---|---|
| | |

| 10 STREET ADDRESS (P.O. Box, RFD #, etc.) | 11 SIC CODE |
|---|---|
| | |

| 12 CITY | 13 STATE | 14 ZIP CODE |
|---|---|---|
| | | |

## III. PREVIOUS OWNER(S) (List most recent first)

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

## IV. REALTY OWNER(S) (If applicable; list most recent first)

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

| 01 NAME | 02 D+B NUMBER |
|---|---|
| | |

| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
|---|---|
| | |

| 05 CITY | 06 STATE | 07 ZIP CODE |
|---|---|---|
| | | |

## V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Telephone memo - to Mr. Bobby Lindsey
EPA Form 2070-12 Preliminary Assessment

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 8 - OPERATOR INFORMATION

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

| II. CURRENT OPERATOR (Provide if different from owner) | | | OPERATOR'S PARENT COMPANY (If applicable) | | |
|---|---|---|---|---|---|
| 01 NAME | | 02 D+B NUMBER | 10 NAME | | 11 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 12 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 13 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 14 CITY | 15 STATE | 16 ZIP CODE |
| 08 YEARS OF OPERATION | 09 NAME OF OWNER | | | | |

| III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner) | | | PREVIOUS OPERATORS' PARENT COMPANIES (If applicable) | | |
|---|---|---|---|---|---|
| 01 NAME | | 02 D+B NUMBER | 10 NAME | | 11 D+B NUMBER |
| Woolfolk Chemical Works | | | | | |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 12 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 13 SIC CODE |
| P. O. Box 938 | | | | | |
| 05 CITY | 06 STATE | 07 ZIP CODE | 14 CITY | 15 STATE | 16 ZIP CODE |
| Fort Valley | GA | 31031 | | | |
| 08 YEARS OF OPERATION | 09 NAME OF OWNER DURING THIS PERIOD | | | | |
| 1976-1981 | Mr. Bobby Lindsey | | | | |
| 01 NAME | | 02 D+B NUMBER | 10 NAME | | 11 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 12 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 13 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 14 CITY | 15 STATE | 16 ZIP CODE |
| 08 YEARS OF OPERATION | 09 NAME OF OWNER DURING THIS PERIOD | | | | |
| 01 NAME | | 02 D+B NUMBER | 10 NAME | | 11 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 04 SIC CODE | 12 STREET ADDRESS (P.O. Box, RFD #, etc.) | | 13 SIC CODE |
| 05 CITY | 06 STATE | 07 ZIP CODE | 14 CITY | 15 STATE | 16 ZIP CODE |
| 08 YEARS OF OPERATION | 09 NAME OF OWNER DURING THIS PERIOD | | | | |

**IV. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

State Files - GA EPD - Woolfolk Chemical Lenox Warehouse
Mr. Bobby Lindsey

EPA FORM 2070-13 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## SITE INSPECTION REPORT
### PART 9 - GENERATOR/TRANSPORTER INFORMATION

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

## II. ON-SITE GENERATOR

| 01 NAME | 02 D+B NUMBER | |
|---|---|---|
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | |
| 05 CITY | 06 STATE / 07 ZIP CODE | |

## III. OFF-SITE GENERATOR(S)

| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
|---|---|---|---|
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY | 06 STATE / 07 ZIP CODE | 05 CITY | 06 STATE / 07 ZIP CODE |
| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY | 06 STATE / 07 ZIP CODE | 05 CITY | 06 STATE / 07 ZIP CODE |

## IV. TRANSPORTER(S)

| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
|---|---|---|---|
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY | 06 STATE / 07 ZIP CODE | 05 CITY | 06 STATE / 07 ZIP CODE |
| 01 NAME | 02 D+B NUMBER | 01 NAME | 02 D+B NUMBER |
| 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE | 03 STREET ADDRESS (P.O. Box, RFD #, etc.) | 04 SIC CODE |
| 05 CITY | 06 STATE / 07 ZIP CODE | 05 CITY | 06 STATE / 07 ZIP CODE |

## V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 10 - PAST RESPONSE ACTIVITIES**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. PAST RESPONSE ACTIVITIES**

01 ☐ A. WATER SUPPLY CLOSED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ D. SPILLED MATERIAL REMOVED — 02 DATE 7/11/81 — 03 AGENCY O. H. Materials Co.
04 DESCRIPTION
Approximately 200 $yd^3$ material shipped to Emelle, Alabama as a result of the 7/81 warehouse fire.

01 ☐ E. CONTAMINATED SOIL REMOVED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ F. WASTE REPACKAGED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ G. WASTE DISPOSED ELSEWHERE — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ H. ON SITE BURIAL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ L. ENCAPSULATION — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ O. EMERGENCY DIKING/SURFACE WATER DIVERSION — 02 DATE 7/1/81 — 03 AGENCY City of Lenox
04 DESCRIPTION Construction of earth dams was undertaken to stop the pesticide contaminated waters from draining off-site.

01 ☐ P. CUTOFF TRENCHES/SUMP — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 10 - PAST RESPONSE ACTIVITIES**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832814 |

**II PAST RESPONSE ACTIVITIES** (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ X. FIRE CONTROL — 02 DATE 7/1/81 — 03 AGENCY City of Lenox
04 DESCRIPTION A chemical fire on 7/1/81 at the Lenox Warehouse in which several gallons of fire fighting waters carried chemicals into a nearby drainage ditch.

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

**III. SOURCES OF INFORMATION** (Cite specific references, e.g., state files, sample analysis, reports)

GA EPD State Files

EPA FORM 2070-13 (7-81)

EPA

**POTENTIAL HAZARDOUS WASTE SITE**
**SITE INSPECTION REPORT**
**PART 11 - ENFORCEMENT INFORMATION**

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. ENFORCEMENT INFORMATION**

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

No Regulatory Enforcement Action has taken place to date. GA EPD Emergency Response Team Member Edward Cook responded to a 7/1/81 chemical fire at the subject site and supervised the warehouse clean-up.

**III. SOURCES OF INFORMATION** *(Cite specific references, e.g., state files, sample analysis, reports)*

GA EPD State Files - Emergency Response Team Files

EPA FORM 2070-13 (7-81)

Received 9/19/84 R.C.O
entered in ERCIS 9/19/84
CBN

needs S.I.
surface soils
should be
ranked

ARDOUS WASTE SITE
RY ASSESSMENT
MATION AND ASSESSMENT

**I. IDENTIFICATION**

| 01 STATE | 02 SITE NUMBER |
|---|---|
| GA | D 082832841 |

**II. SITE**

01 SITE N

03 CITY

09 COORD

10 DIRECT

| 02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER | | | | |
|---|---|---|---|---|
| Rentz Ave. and East Colquitt | | | | |
| 04 STATE | 05 ZIP CODE | 06 COUNTY | 07 COUNTY CODE | 08 CONG DIST |
| GA | 31637 | Cook | 075 | 2 |

ection of I-75 and Central Ave. (Lenox exit
lroad tracks (Southern & Fla.) to intersection
with Rentz. Turn right (south) onto Rentz and proceed one block to warehouse(onleft).

**III. RESPONSIBLE PARTIES**

| 01 OWNER (If known) | 02 STREET (Business, mailing, residential) | | |
|---|---|---|---|
| Mr. Bobby Lindsey | 103 Magnolia Drive P.O. Box 1809 | | |
| 03 CITY | 04 STATE | 05 ZIP CODE | 06 TELEPHONE NUMBER |
| Tifton | GA | 31794 | (912) 386-4300 |
| 07 OPERATOR (If known and different from owner) | 08 STREET (Business, mailing, residential) | | |
| (Former) Woolfolk Chemical Works | P.O. Box 938 | | |
| 09 CITY | 10 STATE | 11 ZIP CODE | 12 TELEPHONE NUMBER |
| Fort Valley | GA | 31030 | ( ) |

13 TYPE OF OWNERSHIP (Check one)
☒ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☒ C. NONE

**IV. CHARACTERIZATION OF POTENTIAL HAZARD**

01 ON SITE INSPECTION
☒ YES DATE 8/8/84 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
Late 1970's (BEGINNING YEAR) 1981 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED Warehouse for extensive herbicide and pesticide (agricultural) product lines. Suspected compounds of regulatory importance Toxaphene. Parathion. Chlordane and DDE.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION Soils adjacent to warehouse and two ditches received large quantities of fire-fighting waters. These waters were tested and contained excessive amounts of Toxaphene. The waters were treated, however, ditch soils and soils around building remain.

**V. PRIORITY ASSESSMENT**

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

**VI. INFORMATION AVAILABLE FROM**

| 01 CONTACT | 02 OF (Agency/Organization) | | 03 TELEPHONE NUMBER |
|---|---|---|---|
| Mr. Bobby Lindsey | Owner | | (912) 386-4300 |
| 04 PERSON RESPONSIBLE FOR ASSESSMENT | 05 AGENCY | 06 ORGANIZATION | 07 TELEPHONE NUMBER | 08 DATE |
| Thomas Westbrook TMW | GA DNR | R.A.U. | (404) 656-7404 | 8 28 84 (MONTH DAY YEAR) |

EPA FORM 2070-12 (7-81)

EPA

# POTENTIAL HAZARDOUS WASTE SITE
## PRELIMINARY ASSESSMENT
### PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

| I. IDENTIFICATION | |
|---|---|
| 01 STATE | 02 SITE NUMBER |
| GA | D082832841 |

**II. HAZARDOUS CONDITIONS AND INCIDENTS**

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: ½ (Acres) — 04 NARRATIVE DESCRIPTION

Soils adjacent to former warehouse and the surrounding lot are known to have received fire fighting waters containing large concentrations of Toxaphene.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 25-50 — 04 NARRATIVE DESCRIPTION

Warehouse lot is open and in a residential/urban setting. Pedestrian traffic is not controlled. Residences were observed on 3 adjacent sides of the warehouse lot.

Trip-Report - Woolfolk Chemical Co. Warehouse, Lenox

Ron Dobbs,
On-Scene Coordinator

Henry Hudson,
Chief, Site Control Unit

A hazardous waste site inspection was performed on 4/5/85 at the above referenced facility. The Woolfolk Chemical Company. warehouse was inspected upon Mr. Moein's request. The hazardous waste site in concern is a vacant warehouse located in a residential area within the city of Lenox. The warehouse which was leased to Woolfolk Chemical Co. had stored agricultural herbicides and pesticides prior to a fire in July of 1981. As a result of the fire, firefighting runoff water contaminated with pesticides (toxaphene and chlordane) had entered the soil around the warehouse.

The subsequent cleanup of the warehouse was performed by O & H Materials under contract by Woolfolk Chemical Co. The cleanup effort involved: removing the stored pesticides, removing contaminated insulation on the walls and roof, decontaminating the concrete floor with high pressure water sprayers, collection and treatment of the contaminated water by carbon adsorption.

Georgia EPD performed a site inspection on 3/14/84. Three soil samples were taken, the results and locations of which are shown on the attached map.

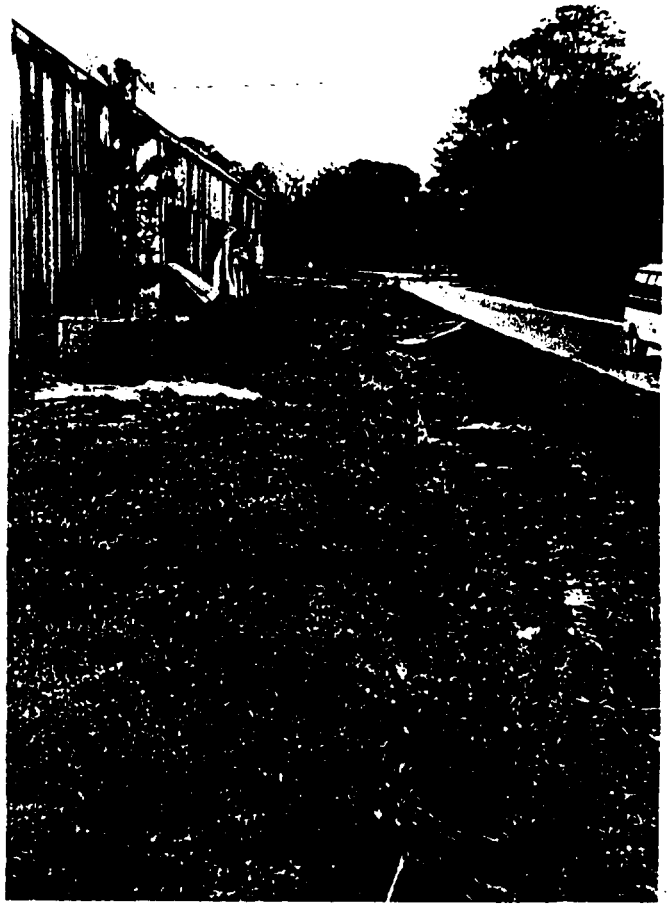
Our involvement came about when Mr. James Lindsey called the emergency spills number on 3/21/85 requesting our participation. I inspected the warehouse with Sue Coker (T.A.T.) and Robert Lindsey (owner of the warehouse). After the inspection I discussed with Mr. Lindsey EPA's role in cleaning up hazardous waste sites. I informed Mr. Lindsey that this particular site does not pose an immediate threat to human health and to the environment and would be evaluated by the Hazard Ranking System.

Tom Westbrook of Georgia EPD has informed me on 4/19/85 that Woolfolk Chemical Co. will be confirming their proposal for work within two weeks, therefore no action by ERRB will be necessary.

Woolfolk Chemical Co. warehouse.

Backview facing south.Warehouse is located in a residential area within the city limits.

Views inside warehouse, all stored chemicals and contaminated materials inside the warehouse were removed. Contaminated insulation on the roof and walls were removed also. Work was performed by O&H Materials.



Ditch along southside of warehouse. Firefighting runoff water entered this ditch during fire in 7/81. water samples taken in 1981 indicated 10-263 ppm Toxaphene was present.

Reference 3

[redacted]

[redacted]K CHEMICAL-LENNOX
[redacted]TUDE 31:16:17 LONGITUDE 83:27:45 1983 POPULATION

| KM | 0.00-.400 | .400-.810 | .810-1.60 | 1.60-3.20 | 3.20-4.80 | 4.80-6.40 | SECTOR TOTALS |
|---|---|---|---|---|---|---|---|
| S 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S 8 | 0 | 0 | 0 | 891 | 0 | 0 | 891 |
| RING TOTALS | 0 | 0 | 0 | 891 | 0 | 0 | 891 |

```
press RETURN to continue
MENU: Geodata Handling Data List procedures
[redacted]ev(in parentheses)          ([redacted])
or a command: HELP, HELP option, BACK, CLEAR, EXIT, TUTOR
GEMS> exit

Type YES to confirm the EXIT command; type NO to restart GEMS
GEMS> yes
$ logout
 HTW          logged out at 28-APR-1994 11:29:06.29
 Itemized resource charges, for this session, follow:

NODE: VAXTM1
ACCT: 9040                          START TIME:     28-APR-1994 11:27:44.60
PROJ: GEMS0001                      FINISH TIME:    28-APR-1994 11:29:06.29
USER: HTW                           BILLING PERIOD:940401
UIC:  [000710,000012]               WEEKDAY:        THURSDAY
BAUD:                               TERMINAL PORT:  VTA649

DESCRIPTION OF CHARGE                QUANTITY                EXPENDITURE
-------------------------------------------------------------------------

  ALL CHARGE LEVELS
    300  baud          (Seconds)        82                      0.0000
    CPU TIME           (Seconds)         3                      0.6983
                                                             -----------
    TOTAL FOR THIS SESSION                                 $    0.6983

** Note:  This total reflects the charges for this process only,
          subprocesses created during this session are accounted for
          separately
CLR PAD
J4~
NO CARRIER
```

Reference 5

BLACK & VEATCH Waste Science, Inc.

TELEPHONE MEMORANDUM

ARCS IV
Lennox Warehouse - Woolfolk Chemicals
Fishing, Floods

BVWS Project 52012.429
BVWS File D.2
May 5, 1994
1:00 p.m.

From: Dan Holder
Company: Georgia Dept. Fish and Wildlife
Phone No.: (912) 285-6094

Recorded by: Jon Erskine

I asked Mr. Holder about fishing on Brushy Creek and the New-River. He said that they do not have use figures, but he estimates that there are no major fisheries in that area. Drainage is too small, not enough water to support a fishery. Most of this area is under private control. Also, the creeks are of intermittent drainage.

BLACK & VEATCH Waste Science, Inc.

TELEPHONE MEMORANDUM

ARCS IV
Lennox Warehouse - Wollfolk Chemicals
City of Adel Water Supply

BVWS Project 52012.429
BVWS File D.2
May 5, 1994
1:30 p.m.

From: Buddy Guy
Company: City of Adel, Water and Sewer Department
Phone No.: (912) 896-4707

Recorded by: Jon Erskine

Mr. Guy said that the City of Adel receives its water from five deep wells. No surface water is used.

JOE D. TANNER, COMMISSIONER
DAVID WALLER, DIVISION DIRECTOR

**Georgia Department of Natural Resources**
**Wildlife Resources Division**
Georgia Natural Heritage Program
2117 U.S. Hwy 278, SE, Social Circle, Georgia 30279
(404) 918-6411 & (706) 557-3032

Reference 7

Dear Database User:

Please keep in mind the limitations of our database. The site in question may contain rare species or important natural areas of which we are unaware.

The data collected by the Georgia Natural Heritage Program comes from a variety of sources, including museum and herbarium records, literature, and reports from individuals and organizations, as well as field surveys by our staff biologists. In most cases the information is not the result of an on-site survey by our staff. Many areas in Georgia have never been surveyed thoroughly. Therefore, the Georgia Natural Heritage Program can only occasionally provide definitive information on the presence or absence of rare species on a given site.

Our files are updated constantly as new information is received. Thus, information provided by our program represents the existing data in our files at the time of the request and should not be considered a final statement on the species or area under consideration.

Sincerely,

Georgia Natural Heritage Program

# SPECIAL ANIMALS OF GEORGIA

## GEORGIA DEPARTMENT OF NATURAL RESOURCES, WILDLIFE RESOURCES DIVISION, GEORGIA NATURAL HERITAGE PROGRAM

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | STATE RANK | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|---|---|
| ACANTHARCHUS POMOTIS | MUD SUNFISH | G5 | S3 | | |
| ACIPENSER BREVIROSTRUM | SHORTNOSE STURGEON | G3 | S2 | LE | E |
| ACIPENSER FULVESCENS | LAKE STURGEON | G3 | SH | C2 | |
| AIMOPHILA AESTIVALIS | BACHMAN'S SPARROW | G3 | S3 | C2 | R |
| ALASMIDONTA ARCULA | ALTAMAHA ARC MUSSEL | G2 | S1S3 | C2 | |
| ALASMIDONTA MACCORDI | COOSA ELKTOE | GX | SH | 3A | |
| ALOSA ALABAMAE | ALABAMA SHAD | G4 | S1 | | U |
| ALOSA CHRYSOCHLORIS | SKIPJACK HERRING | G5 | S2? | | |
| AMBYSTOMA CINGULATUM | FLATWOODS SALAMANDER | G4 | S3 | C2 | R |
| AMEIURUS SERRACANTHUS | SPOTTED BULLHEAD | G3 | S2 | | R |
| AMMODRAMUS HENSLOWII | HENSLOW'S SPARROW | G4 | S3 | | |
| AMMODRAMUS MARITIMUS | SEASIDE SPARROW | G4 | S4 | | |
| AMPHIUMA PHOLETER | ONE-TOED AMPHIUMA | G3 | S1 | | R |
| ANEIDES AENEUS | GREEN SALAMANDER | G3G4 | S2 | C2 | R |
| AQUILA CHRYSAETOS | GOLDEN EAGLE | G4 | S1 | | |
| ARAMUS GUARAUNA | LIMPKIN | G5 | S1S2 | | |
| BALAENOPTERA BOREALIS | SEI WHALE | G2 | S? | LE | |
| BALAENOPTERA PHYSALUS | FIN WHALE | G2 | S? | LE | |
| BELONEURIA GEORGIANA | GEORGIA BELONEURIAN STONEFLY | G1G3 | S1S3 | 3C | |
| BOTAURUS LENTIGINOSUS | AMERICAN BITTERN | G4 | S3? | | |
| CAMBARUS EXTRANEUS | CHICKAMAUGA CRAYFISH | G3 | S? | C2 | |
| CAMPEPHILUS PRINCIPALIS | IVORY-BILLED WOODPECKER | G1 | SX | LE | E |
| CARETTA CARETTA | LOGGERHEAD SEA TURTLE | G3 | S3 | LT | T |
| CARUNCULINA PULLA | SAVANNAH SHORE MUSSEL | G3 | S1S3 | C2 | |
| CATHARUS FUSCESCENS | VEERY | G5 | S4 | | |
| CHARADRIUS MELODUS | PIPING PLOVER | G3 | S1S2 | LELT | T |
| CHARADRIUS WILSONIA | WILSON'S PLOVER | G5 | S2S3 | | R |
| CHELONIA MYDAS | GREEN SEA TURTLE | G3 | S1 | LELT | T |
| CLEMMYS GUTTATA | SPOTTED TURTLE | G5 | S3S4 | | U |
| CLEMMYS MUHLENBERGII | BOG TURTLE | G4 | S1 | C2 | T |
| CLETHRIONOMYS GAPPERI | SOUTHERN RED-BACKED VOLE | G5 | S3S4 | | |
| COCCYZUS ERYTHROPTHALMUS | BLACK-BILLED CUCKOO | G5 | S3? | | |
| CONDYLURA CRISTATA | STAR-NOSED MOLE | G5 | S2? | | |
| CORDULEGASTER SAYI | SAY'S SPIKETAIL DRAGONFLY | G1G2 | S? | C2 | |
| CORVUS CORAX | COMMON RAVEN | G5 | SU | | R |
| CRYPTOBRANCHUS ALLEGANIENSIS | HELLBENDER | G4 | S3 | C2 | R |
| CYCLEPTUS ELONGATUS | BLUE SUCKER | G4 | SX | C2 | |
| CYPRINELLA CAERULEA | BLUE SHINER | G2 | S1S2 | C2 | E |
| CYPRINELLA CALLISEMA | OCMULGEE SHINER | G3 | S3 | | |
| CYPRINELLA CALLITAENIA | BLUESTRIPE SHINER | G2 | S1 | C2 | T |
| CYPRINELLA GALACTURA | WHITETAIL SHINER | G5 | S3 | | |
| CYPRINELLA GIBBSI | TALLAPOOSA SHINER | G4 | S3 | | R |
| CYPRINELLA LEEDSI | BANNERFIN SHINER | G3 | S3S4 | | |
| CYPRINELLA MONACHA | SPOTFIN CHUB | G2 | SH | LT | |
| CYPRINELLA NIVEA | WHITEFIN SHINER | G4 | S3 | | |
| CYPRINELLA SPILOPTERA | SPOTFIN SHINER | G5 | S2 | | |
| CYPRINELLA XAENURA | ALTAMAHA SHINER | G3? | S3 | C2 | E |
| DENDROICA CERULEA | CERULEAN WARBLER | G5 | S3? | | |

# SPECIAL ANIMALS OF GEORGIA

## GEORGIA DEPARTMENT OF NATURAL RESOURCES, WILDLIFE RESOURCES DIVISION, GEORGIA NATURAL HERITAGE PROGRAM

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | STATE RANK | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|---|---|
| DENDROICA KIRTLANDII | KIRTLAND'S WARBLER | G1 | SN | LE | E |
| DERMOCHELYS CORIACEA | LEATHERBACK SEA TURTLE | G3 | S1 | LE | E |
| DESMOGNATHUS AENEUS | SEEPAGE SALAMANDER | G4 | S3 | | |
| DOLANIA AMERICANA | AMERICAN SAND-BURROWING MAYFLY | G? | S? | C2 | |
| DORMITATOR MACULATUS | FAT SLEEPER | G5 | S3 | | |
| DRYMARCHON CORAIS COUPERI | EASTERN INDIGO SNAKE | G4T3 | S3 | LT | T |
| EGRETTA RUFESCENS | REDDISH EGRET | G4 | S2S3 | C2 | |
| ELANOIDES FORFICATUS | AMERICAN SWALLOW-TAILED KITE | G5 | S2 | | R |
| ELEOTRIS PISONIS | SPINYCHEEK SLEEPER | G5 | S3 | | |
| ELLIPTIO NIGELLA | RECOVERY PEARLY MUSSEL | GH | SH | C2 | |
| ELLIPTIO SPINOSA | GEORGIA SPINEY MUSSEL | G1 | S1S3 | C2 | |
| EMPIDONAX MINIMUS | LEAST FLYCATCHER | G5 | S3 | | |
| EMPIDONAX TRAILLII | WILLOW FLYCATCHER | G5 | S3 | | |
| ENNEACANTHUS CHAETODON | BLACKBANDED SUNFISH | G5 | S1S2 | | R |
| EPIOBLASMA METASTRIATA | UPLAND COMBSHELL | G1Q | S? | C2 | E |
| EPIOBLASMA OTHCALOOGENSIS | SOUTHERN ACORNSHELL | G1Q | S? | C2 | E |
| ERETMOCHELYS IMBRICATA | HAWKSBILL SEA TURTLE | G3 | SN | LE | E |
| ERIMYSTAX INSIGNIS | BLOTCHED CHUB | G4? | S2 | | T |
| ETHEOSTOMA BREVIROSTRUM | HOLIDAY DARTER | G? | S? | | T |
| ETHEOSTOMA CAERULEUM | RAINBOW DARTER | G5 | S1 | | |
| ETHEOSTOMA CAMURUM | BLUEBREAST DARTER | G3 | S1? | | |
| ETHEOSTOMA CHLOROBRANCHIUM | GREENFIN DARTER | G3 | S1 | | T |
| ETHEOSTOMA CINEREUM | ASHY DARTER | G2 | S1 | | |
| ETHEOSTOMA COOSAE | COOSA DARTER | G4 | S3 | | |
| ETHEOSTOMA DITREMA | COLDWATER DARTER | G2 | S1 | C2 | T |
| ETHEOSTOMA DURYI | BLACK DARTER | G4 | S1 | | R |
| ETHEOSTOMA EDWINI | BROWN DARTER | G5 | S3 | | |
| ETHEOSTOMA FRICKSIUM | SAVANNAH DARTER | G3 | S2 | | |
| ETHEOSTOMA JESSIAE | BLUESIDE DARTER | G4Q | S2 | | |
| ETHEOSTOMA JORDANI | GREENBREAST DARTER | G4 | S2S3 | | |
| ETHEOSTOMA KENNICOTTI | STRIPETAIL DARTER | G5 | S1 | | |
| ETHEOSTOMA MACULATUM | SPOTTED DARTER | G2 | S1 | | |
| ETHEOSTOMA PARVIPINNE | GOLDSTRIPE DARTER | G4 | S2 | | R |
| ETHEOSTOMA RUFILINEATUM | REDLINE DARTER | G5 | S2 | | |
| ETHEOSTOMA RUPESTRE | ROCK DARTER | G4 | S2S3 | | |
| ETHEOSTOMA SERRIFERUM | SAWCHEEK DARTER | G5 | S3 | | |
| ETHEOSTOMA SIMOTERUM | TENNESSEE SNUBNOSE DARTER | G5 | S1 | | |
| ETHEOSTOMA SP. CF COOSAE | CHEROKEE DARTER | G? | S? | | T |
| ETHEOSTOMA SP. CF JORDANI | ETOWAH DARTER | G? | S? | | T |
| ETHEOSTOMA SP. CF JORDANI | LIPSTICK DARTER | G? | S? | | E |
| ETHEOSTOMA SWAINI | GULF DARTER | G5 | S3 | | |
| ETHEOSTOMA TALLAPOOSAE | TALLAPOOSA DARTER | G? | S? | | R |
| ETHEOSTOMA TRISELLA | TRISPOT DARTER | G2 | S1 | C2 | T |
| ETHEOSTOMA VULNERATUM | WOUNDED DARTER | G? | S? | | E |
| ETHEOSTOMA ZONALE | BANDED DARTER | G5 | S1S2 | | |
| EUBALAENA GLACIALIS | NORTHERN RIGHT WHALE | G2 | S1 | LE | E |
| EUMECES ANTHRACINUS | COAL SKINK | G5 | S1 | | |
| EUMECES EGREGIUS | MOLE SKINK | G5 | S3 | | |

# SPECIAL ANIMALS OF GEORGIA

## GEORGIA DEPARTMENT OF NATURAL RESOURCES, WILDLIFE RESOURCES DIVISION, GEORGIA NATURAL HERITAGE PROGRAM

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | STATE RANK | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|---|---|
| EURYCEA LONGICAUDA | LONGTAIL SALAMANDER | G5 | S2 | | |
| EURYCEA LUCIFUGA | CAVE SALAMANDER | G5 | S3 | | |
| EURYCEA WILDERAE | BLUE RIDGE TWO-LINED SALAMANDER | G5Q | S2? | | |
| EXTRARIUS AESTIVALIS | SPECKLED CHUB | G5 | S1S2 | | |
| FALCO PEREGRINUS | PEREGRINE FALCON | G3 | S1 | E/SA | E |
| FARANCIA ERYTROGRAMMA | RAINBOW SNAKE | G5 | S3 | | |
| FELIS CONCOLOR CORYI | FLORIDA PANTHER | G4T1 | SH | LE | E |
| FELIS CONCOLOR COUGUAR | EASTERN COUGAR | G4TH | SR | LE | E |
| FUNDULUS AUROGUTTATUS | BANDED TOPMINNOW | G5? | S3 | | R |
| FUNDULUS BIFAX | STIPPLED STUDFISH | G? | S? | | E |
| FUNDULUS CATENATUS | NORTHERN STUDFISH | G5 | S1 | | T |
| FUNDULUS CHRYSOTUS | GOLDEN TOPMINNOW | G5 | S3 | | |
| FUNDULUS ESCAMBIAE | EASTERN STARHEAD TOPMINNOW | G? | S3 | | |
| FUNDULUS LUCIAE | SPOTFIN KILLIFISH | G4? | S3 | | |
| FUSCONAIA MASONI | ATLANTIC PIGTOE MUSSEL | G3 | S? | | E |
| GEOMYS PINETIS FONTANELUS | SHERMAN'S POCKET GOPHER | G5TH | S4 | 3A | |
| GOPHERUS POLYPHEMUS | GOPHER TORTOISE | G2 | S3 | LTC2 | T |
| GRAPTEMYS BARBOURI | BARBOUR'S MAP TURTLE | G2 | S2 | C2 | T |
| GRAPTEMYS GEOGRAPHICA | MAP TURTLE | G5 | S1 | | R |
| GRAPTEMYS PULCHRA | ALABAMA MAP TURTLE | G4 | S1 | | R |
| GRUS CANADENSIS PRATENSIS | FLORIDA SANDHILL CRANE | G5T2T3 | S1 | | |
| GRUS CANADENSIS TABIDA | GREATER SANDHILL CRANE | G5TU | S2 | | |
| HAEMATOPUS PALLIATUS | AMERICAN OYSTERCATCHER | G5 | S2S3 | | R |
| HAIDEOTRITON WALLACEI | GEORGIA BLIND SALAMANDER | G2 | S1 | C2 | T |
| HALIAEETUS LEUCOCEPHALUS LEUCOCEPHALUS | SOUTHERN BALD EAGLE | G3TU | S2 | | E |
| HEMIDACTYLIUM SCUTATUM | FOUR-TOED SALAMANDER | G5 | S2 | | |
| HEMITREMIA FLAMMEA | FLAME CHUB | G4 | S1 | | E |
| HETEROCLEON BERNERI | BERNER'S TWO-WINGED MAYFLY | G1G3 | S1S3 | C2 | |
| HETERODON SIMUS | SOUTHERN HOGNOSE SNAKE | G4G5 | S3 | | |
| HIMANTOPUS MEXICANUS | BLACK-NECKED STILT | G5 | S1S2 | | |
| HIODON TERGISUS | MOONEYE | G5 | S1 | | |
| HOMOEONEURIA DOLANI | BLACKWATER SAND-FILTERING MAYFLY | G? | S? | C2 | |
| HYBOGNATHUS REGIUS | EASTERN SILVERY MINNOW | G5 | S2? | | |
| HYBOPSIS AMBLOPS | BIGEYE CHUB | G4? | S1S2 | | R |
| HYBOPSIS LINEAPUNCTATA | LINED CHUB | G3 | S3 | | |
| ICHTHYOMYZON BDELLIUM | OHIO LAMPREY | G3 | S3? | | R |
| ICHTHYOMYZON CASTANEUS | CHESTNUT LAMPREY | G5 | S3 | | |
| ICHTHYOMYZON GAGEI | SOUTHERN BROOK LAMPREY | G5 | S3 | | |
| ICHTHYOMYZON GREELEYI | ALLEGANY BROOK LAMPREY | G3 | S3 | | |
| KINOSTERNON BAURII | STRIPED MUD TURTLE | G5 | S3 | | |
| LAMPETRA AEPYPTERA | LEAST BROOK LAMPREY | G5 | S3 | | |
| LAMPROPELTIS TRIANGULUM | MILK SNAKE | G5 | S2 | | |
| LAMPSILIS ALTILIS | FINE-LINED POCKETBOOK | G? | S? | C2 | T |
| LANIUS LUDOVICIANUS MIGRANS | MIGRANT LOGGERHEAD SHRIKE | G4T2 | S? | C2 | |
| LASIURUS INTERMEDIUS | NORTHERN YELLOW BAT | G4G5 | S2S3 | | |
| LATERALLUS JAMAICENSIS | BLACK RAIL | G4? | S2? | | |
| LEPIDOCHELYS KEMPII | KEMP'S RIDLEY SEA TURTLE | G1 | SN | LE | E |
| LEPISOSTEUS OCULATUS | SPOTTED GAR | G5 | S1 | | |

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| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | STATE RANK | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|---|---|
| LEUROGNATHUS MARMORATUS | SHOVELNOSE SALAMANDER | G4 | S3 | | |
| LORDITHON NIGER | BLACK LORDITHON ROVE BEETLE | G? | S? | C2 | |
| LOXIA CURVIROSTRA | RED CROSSBILL | G5 | SU | | |
| LUCANIA GOODEI | BLUEFIN KILLIFISH | G5 | S1 | | U |
| LUCANIA PARVA | RAINWATER KILLIFISH | G5 | S1 | | |
| LUXILUS COCCOGENIS | WARPAINT SHINER | G5 | S3 | | |
| LYTHRURUS ARDENS | ROSEFIN SHINER | G5 | S1 | | |
| LYTHRURUS ATRAPICULUS | BLACKTIP SHINER | G4 | S2 | | |
| LYTHRURUS BELLUS | PRETTY SHINER | G5 | S2 | | T |
| LYTHRURUS LIRUS | MOUNTAIN SHINER | G4 | S3 | | |
| MACRHYBOPSIS STORERIANA | SILVER CHUB | G5 | S2 | | |
| MACROCLEMYS TEMMINCKII | ALLIGATOR SNAPPING TURTLE | G3 | S3 | C2 | T |
| MARSTONIA AGARHECTA | OCMULGEE MARSTONIA | G1G3 | S1S3 | C2 | |
| MARSTONIA CASTOR | BEAVERPOND MARSTONIA | G1G3 | S1S3 | C2 | |
| MEDIONIDUS ACUTISSIMUS | ALABAMA MOCCASINSHELL | G1 | S? | | T |
| MEDIONIDUS PARVULUS | COOSA MOCCASINSHELL | G? | S? | | E |
| MEGAPTERA NOVAEANGLIAE | HUMPBACK WHALE | G2 | SN | LE | E |
| MENIDIA BERYLLINA | TIDEWATER SILVERSIDE | G5 | S2 | | |
| MICROPTERUS NOTIUS | SUWANNEE BASS | G2G3 | S1 | | R |
| MICRURUS FULVIUS | EASTERN CORAL SNAKE | G5 | S3 | | |
| MOXOSTOMA CARINATUM | RIVER REDHORSE | G4 | S1 | | R |
| MOXOSTOMA LACHNERI | GREATER JUMPROCK | G3? | S3 | | |
| MOXOSTOMA ROBUSTUM | SMALLFIN REDHORSE | G3G4 | S3 | | |
| MOXOSTOMA SP. CF CARINATUM | ATLANTIC RIVER REDHORSE | G? | S? | | E |
| MYCTERIA AMERICANA | WOOD STORK | G5 | S2 | LE | E |
| MYOTIS AUSTRORIPARIUS | SOUTHEASTERN BAT | G4 | S3S4 | C2 | |
| MYOTIS GRISESCENS | GRAY MYOTIS | G2 | S1 | LE | E |
| MYOTIS LEIBII | EASTERN SMALL-FOOTED MYOTIS | G3 | S2? | C2 | |
| MYOTIS SODALIS | INDIANA MYOTIS | G2 | SA | LE | E |
| NECTURUS ALABAMENSIS | ALABAMA WATERDOG | G4Q | S2 | | |
| NECTURUS MACULOSUS | MUDPUPPY | G5 | S1 | | |
| NECTURUS PUNCTATUS | DWARF WATERDOG | G4 | S2 | | |
| NEOFIBER ALLENI | ROUND-TAILED MUSKRAT | G3? | S3S4 | C2 | T |
| NEOTOMA FLORIDANA HAEMATOREIA | EASTERN WOODRAT | G5T5 | S5 | C2 | |
| NEOTOMA FLORIDANA ILLINOENSIS | EASTERN WOODRAT | G5T5 | S5 | | |
| NERODIA FLORIDANA | FLORIDA GREEN WATER SNAKE | G5Q | S2 | | |
| NICROPHORUS AMERICANUS | AMERICAN BURYING BEETLE | G1 | S? | LE | |
| NOTOPHTHALMUS PERSTRIATUS | STRIPED NEWT | G3 | S2 | | R |
| NOTROPIS ALTIPINNIS | HIGHFIN SHINER | G5 | S1 | | |
| NOTROPIS ARIOMMUS | POPEYE SHINER | G3 | S1 | | T |
| NOTROPIS ASPERIFRONS | BURRHEAD SHINER | G4 | S3 | | |
| NOTROPIS ATHERINOIDES | EMERALD SHINER | G5 | S1 | | |
| NOTROPIS CHROSOMUS | RAINBOW SHINER | G4 | S3 | | |
| NOTROPIS HARPERI | REDEYE CHUB | G4 | S1 | | R |
| NOTROPIS HYPSILEPIS | HIGHSCALE SHINER | G3 | S2S3 | | T |
| NOTROPIS LEUCIODUS | TENNESSEE SHINER | G5 | S3 | | |
| NOTROPIS PHOTOGENIS | SILVER SHINER | G5 | S1 | | E |
| NOTROPIS RUBELLUS | ROSYFACE SHINER | G5 | S1 | | |

# SPECIAL ANIMALS OF GEORGIA

## GEORGIA DEPARTMENT OF NATURAL RESOURCES, WILDLIFE RESOURCES DIVISION, GEORGIA NATURAL HERITAGE PROGRAM

| SCIENTIFIC NAME | COMMON NAME | GLOBAL RANK | STATE RANK | FEDERAL STATUS | STATE STATUS |
|---|---|---|---|---|---|
| NOTROPIS SCEPTICUS | SANDBAR SHINER | G4 | S2 | | R |
| NOTROPIS SPECTRUNCULUS | MIRROR SHINER | G4 | S3 | | |
| NOTROPIS STILBIUS | SILVERSTRIPE SHINER | G4? | S3 | | |
| NOTROPIS TELESCOPUS | TELESCOPE SHINER | G5 | S2 | | |
| NOTROPIS VOLUCELLUS | MIMIC SHINER | G5 | S2 | | |
| NOTURUS ELEUTHERUS | MOUNTAIN MADTOM | G5 | S1 | | T |
| NOTURUS FLAVIPINNIS | YELLOWFIN MADTOM | G2 | SH | LTXN | |
| NOTURUS FUNEBRIS | BLACK MADTOM | G5 | S1S2 | | R |
| NOTURUS MUNITUS | FRECKLEBELLY MADTOM | G3 | S1 | C2 | E |
| NOTURUS NOCTURNUS | FRECKLED MADTOM | G5 | SH | | E |
| NYCTANASSA VIOLACEA | YELLOW-CROWNED NIGHT-HERON | G5 | S3S4 | | |
| NYCTICORAX NYCTICORAX | BLACK-CROWNED NIGHT-HERON | G5 | S3S4 | | |
| ODOCOILEUS VIRGINIANUS NIGRIBARBIS | BLACKBEARD'S WHITETAILED DEER | G5T1Q | S? | C2 | |
| ONTHOPHAGUS POLYPHEMI | ONTHOPHAGUS TORTOISE COMMENSAL SCARAB BEETLE | G? | S? | C2 | |
| OPHISAURUS ATTENUATUS | SLENDER GLASS LIZARD | G5 | S3 | | |
| OPHISAURUS COMPRESSUS | ISLAND GLASS LIZARD | G4 | S2 | C2 | |
| OPHISAURUS MIMICUS | MIMIC GLASS LIZARD | G3 | S2 | | |
| PANDION HALIAETUS | OSPREY | G5 | S3 | | |
| PASSERCULUS SANDWICHENSIS | SAVANNAH SPARROW | G5 | S5 | | |
| PERCINA ANTESELLA | AMBER DARTER | G2 | S1 | LE | E |
| PERCINA AURANTIACA | TANGERINE DARTER | G3G4 | S1 | | T |
| PERCINA AUROLINEATA | GOLDLINE DARTER | G2 | S1 | C2 | T |
| PERCINA EVIDES | GILT DARTER | G4 | S3 | | |
| PERCINA JENKINSI | CONASAUGA LOGPERCH | G1 | S1 | LE | E |
| PERCINA LENTICULA | FRECKLED DARTER | G2 | S1 | C2 | E |
| PERCINA MACULATA | BLACKSIDE DARTER | G5 | S1 | | |
| PERCINA PALMARIS | BRONZE DARTER | G3 | S1S2 | | |
| PERCINA SCIERA | DUSKY DARTER | G5 | S1 | | R |
| PERCINA SHUMARDI | RIVER DARTER | G5 | S1 | | E |
| PERCINA SP. CF MACROCEPHALA | MUSCADINE DARTER | G? | S? | | R |
| PERCINA SQUAMATA | OLIVE DARTER | G3 | S1 | C2 | T |
| PERCINA TANASI | SNAIL DARTER | G2 | S1 | LT | T |
| PEROMYSCUS GOSSYPINUS ANASTASAE | ANASTASIA ISLAND COTTON MOUSE | G5T1Q | S? | | |
| PETROMYZON MARINUS | SEA LAMPREY | G5 | S3 | | |
| PHENACOBIUS CATOSTOMUS | RIFFLE MINNOW | G4? | S3 | | |
| PHENACOBIUS CRASSILABRUM | FATLIPS MINNOW | G3 | S1 | | E |
| PHENACOBIUS URANOPS | STARGAZING MINNOW | G4 | S1 | | T |
| PHYCIODES BATESII | TAWNY CRESCENT BUTTERFLY | G3G4 | SH | C2 | |
| PHYSETER MACROCEPHALUS | SPERM WHALE | G2 | S? | LE | |
| PICOIDES BOREALIS | RED-COCKADED WOODPECKER | G2 | S2 | LE | E |
| PIMEPHALES NOTATUS | BLUNTNOSE MINNOW | G5 | S2? | | |
| PIMEPHALES VIGILAX | BULLHEAD MINNOW | G5 | S2 | | |
| PITUOPHIS MELANOLEUCUS MELANOLEUCUS | NORTHERN PINE SNAKE | G5T? | S? | C2 | |
| PLECOTUS RAFINESQUII | RAFINESQUE'S BIG-EARED BAT | G4 | S3? | C2 | R |
| PLEGADIS FALCINELLUS | GLOSSY IBIS | G5 | S2S3 | | |
| PLETHODON DORSALIS | ZIGZAG SALAMANDER | G5Q | S1 | | |
| PLETHODON PETRAEUS | PIGEON MOUNTAIN SALAMANDER | G1G2 | S1S2 | | R |
| PLETHODON TEYAHALEE | SOUTHERN APPALACHIAN SLIMY SALAMANDER | G3 | S1 | | |

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|---|---|---|---|---|---|
| PLETHODON WEBSTERI | WEBSTER'S SALAMANDER | G3Q | S1 | | |
| PLEUROBEMA DECISUM | SOUTHERN CLUBSHELL | G1G2 | S? | | E |
| PLEUROBEMA GEORGIANUM | SOUTHERN PIGTOE | G? | S? | | E |
| PLEUROBEMA PEROVATUM | OVATE CLUBSHELL | G? | S? | | E |
| PROBLEMA BULENTA | RARE SKIPPER | G2G3 | S1? | C2 | |
| PSEUDACRIS BRIMLEYI | BRIMLEY'S CHORUS FROG | G5 | S2 | | |
| PSEUDEMYS NELSONI | FLORIDA REDBELLY TURTLE | G5 | S2 | | |
| PSEUDIRON MERIDIONALIS | MERIDION BLACKWATER MAYFLY | G? | S? | 3B | |
| PSEUDOBRANCHUS STRIATUS | DWARF SIREN | G5 | S3 | | |
| PSEUDORCA CRASSIDENS | FALSE KILLER WHALE | G? | SN | | |
| PSEUDOTRITON MONTANUS | MUD SALAMANDER | G5 | S3 | | |
| PTERONOTROPIS EURYZONUS | BROADSTRIPE SHINER | G3 | S1 | | R |
| PTERONOTROPIS HYPSELOPTERUS | SAILFIN SHINER | G5 | S3 | | |
| PTERONOTROPIS WELAKA | BLUENOSE SHINER | G4 | S1 | | R |
| PTYCHOBRANCHUS GREENI | TRIANGULAR KIDNEYSHELL | G1 | S? | | E |
| RANA AREOLATA | CRAWFISH FROG | G4 | S3 | | |
| RANA SYLVATICA | WOOD FROG | G5 | S2 | | |
| RANA VIRGATIPES | CARPENTER FROG | G5 | S3 | | |
| REGINA ALLENI | STRIPED CRAYFISH SNAKE | G5 | S2 | | |
| RHADINAEA FLAVILATA | PINE WOODS SNAKE | G4 | S2 | | |
| ROSTRHAMUS SOCIABILIS | SNAIL KITE | G4? | SA | | |
| RYNCHOPS NIGER | BLACK SKIMMER | G5 | S2 | | |
| SCIURUS NIGER SHERMANI | SHERMAN'S FOX SQUIRREL | G5T2 | S? | C2 | |
| SEMINATRIX PYGAEA | BLACK SWAMP SNAKE | G5 | S3 | | |
| SOMATOGYRUS TENAX | SAVANNAH PEBBLESNAIL | G1G3 | S1S3 | C2 | |
| SOREX CINEREUS | MASKED SHREW | G5 | S1S2 | | |
| SOREX HOYI | PYGMY SHREW | G5 | S1? | | |
| STENELLA FRONTALIS | ATLANTIC SPOTTED DOLPHIN | G? | SN | | |
| STERNA ANTILLARUM | LEAST TERN | G4 | S2S3 | | R |
| STERNA DOUGALLII | ROSEATE TERN | G3 | S? | LELT | |
| STERNA MAXIMA | ROYAL TERN | G5 | S5 | | |
| STERNA NILOTICA | GULL-BILLED TERN | G5 | S1 | | T |
| STORERIA VICTA | FLORIDA BROWN SNAKE | G4G5Q | SU | | |
| SYLVILAGUS TRANSITIONALIS | NEW ENGLAND COTTONTAIL | G4 | S1S2 | C2 | R |
| TAMIASCIURUS HUDSONICUS | RED SQUIRREL | G5 | S3 | | |
| THRYOMANES BEWICKII | BEWICK'S WREN | G5 | SU | | R |
| TRICHECHUS MANATUS | MANATEE | G2? | S1S2 | LE | E |
| TRIONYX MUTICUS | SMOOTH SOFTSHELL | G5 | SRS1 | | |
| TROGLODYTES TROGLODYTES | WINTER WREN | G5 | S2S3 | | |
| TYPHLICHTHYS SUBTERRANEUS | SOUTHERN CAVEFISH | G3 | S2S3 | | R |
| TYRANNUS DOMINICENSIS | GRAY KINGBIRD | G5 | S2S3 | | |
| UMBRA PYGMAEA | EASTERN MUDMINNOW | G5 | S3 | | |
| VERMIVORA BACHMANII | BACHMAN'S WARBLER | G1 | S1 | LE | E |

can be used for
Cook co. potentials



# SPECIAL ANIMALS OF LOWNDES COUNTY

**This list was compiled in January 1994 and represents both potential and known occurrences of special animals (rare and/or protected in Georgia) for Lowndes County. Source: Georgia Dept. of Natural Resources, Wildlife Resources Division, Gerogia Natural Heritage Program.**

| Animal | Habitat |
|---|---|
| *Acantharchus pomotis* | Blackwater streams; bays; cypress/gum ponds |
| * *Aimophila aestivalis* | Open pine or oak woods; old fields; brushy areas |
| * *Ambystoma cingulatum* | Pine flatwoods; moist savannahs; cypress/gum ponds |
| *Ammodramus henslowii* | Fields; meadows |
| *Botaurus lentiginosus* | Marshes; lakes |
| *Condylura cristata* | Moist meadows; woods; swamps |
| *Cyprinella callisema* | Blackwater & brownwater streams |
| *Cyprinella leedsi* | Blackwater & brownwater streams |
| * *Drymarchon corais couperi* | Sandhills; pine flatwoods; dry hammocks |
| * *Elanoides forficatus* | River swamps; marshes |
| * *Enneacanthus chaetodon* | Blackwater streams; bays; cypress/gum ponds |
| *Eumeces egregius* | Coastal dunes; longleaf pine-turkey oak woods; dry hammocks |
| *Farancia erytrogramma* | River swamps; springs; sandy fields near water |
| *Fundulus chrysotus* | Blackwater streams; ponds; bays; brackish streams |
| * *Fundulus cingulatus* | Blackwater streams; ponds; bays; freshwater marshes |
| * *Gopherus polyphemus* | Sandhills; dry hammocks; longleaf pine-turkey oak woods |
| *Grus canadensis* | Freshwater marshes; bays; fields |
| *Heterodon simus* | Open, sandy woods; fields; floodplains |
| *Kinosternon baurii* | River swamps; sloughs; ponds; marshes |
| *Lanius ludovicianus migrans* | Open woods; field edges |
| *Lasiurus intermedius* | Wooded areas near open water or fields |
| *Lucania parva* | Ponds; creeks |
| * *Micropterus notius* | Springs; rocky shoals; blackwater streams |
| *Micrurus fulvius* | Hardwood forests; pine flatwoods; dry hammocks; marshes |
| * *Mycteria americana* | Cypress/gum ponds; marshes; river swamps; bays |
| *Myotis austroriparius* | Caves and buildings near water |
| * *Neofiber alleni* | Freshwater marshes; bogs |
| *Nerodia floridana* | Swamps; marshes; limesink ponds; bays |
| * *Notophthalmus perstriatus* | Pine flatwoods; ponds; ditches |
| *Nyctanassa violacea* | River swamps; marshes; cypress/gum ponds |
| *Nycticorax nycticorax* | River swamps; marshes; cypress/gum ponds |
| *Ophisaurus attenuatus* | Open woods; savannahs; old fields; edges of streams & ponds; sandhills |
| *Ophisaurus compressus* | Sandhills; pine flatwoods; barrier island scrub forests |

* = State-protected species

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| Animal | Habitat |
|---|---|
| *Ophisaurus mimicus* | Pine flatwoods |
| *Pandion haliaetus* | Lakes; rivers; seacoasts |
| * *Picoides borealis* | Open pine woods; pine savannahs |
| *Pituophis melanoleucus mugitus* | Upland forests; grasslands; floodplains; old fields |
| *Pseudobranchus striatus* | Swamps; marshes; limesink ponds; bays |
| *Pseudotriton montanus* | Swamps; muddy seeps; springs |
| *Pteronotropis hypselopterus* | Blackwater & brownwater streams |
| *Rana areolata* | Floodplains; wet meadows; pastures; ponds |
| *Rana virgatipes* | Swamps; bogs; blackwater streams; ponds |
| *Regina alleni* | Freshwater marshes; bogs; ponds; blackwater streams |
| *Seminatrix pygaea* | Swamps; ponds; marshes; lakes |
| *Storeria victa* | Swamps; bogs; fields; moist woods |
| *Umbra pygmaea* | Muddy streams & ponds |

* = State-protected species

# SPECIAL PLANTS OF LOWNDES COUNTY

**This list was compiled in January 1994 and represents both potential and known occurrences of special plants (rare and/or protected in Georgia) for Lowndes County. Source: Georgia Dept. of Natural Resources, Wildlife Resources Division, Gerogia Natural Heritage Program.**

| Plants | Habitat |
|---|---|
| *Agalinis aphylla* | Longleaf pine-wiregrass savannahs; pine flatwoods |
| *Agalinis divaricata* | Dry, grassy, pine-scrub oak ridges |
| *Agalinis filicaulis* | Seasonally wet, longleaf pine-wiregrass savannahs; pine flatwoods |
| *Agalinis georgiana* | Dry, grassy, pine-scrub oak ridges |
| *Agrimonia incisa* | Mixed oak-hickory forests, dry pine forests |
| *Amorpha georgiana* | Dry pine-wiregrass savannahs |
| *Amphicarpum muhlenbergianum* | Pine flatwoods |
| *Andropogon mohrii* | Longleaf pine-wiregrass savannahs; pine-cypress savannahs |
| *Apteria aphylla* | Mesic hardwoods or magnolia-beech bluff forests |
| *Aristida condensata* | Ohoopee Dunes; pine barrens |
| *Aristida simpliciflora* | Longleaf pine-wiregrass savannahs |
| *Asclepias pedicellata* | Bogs, wet savannahs |
| *Asclepias rubra* | Bogs, wet savannahs |
| *Asimina pygmaea* | Flatwoods, wet savannahs |
| *Asimina reticulata* | Flatwoods, wet savannahs |
| *Baccharis glomeruliflora* | Hammocks; moist woods; swamps |
| * *Balduina atropurpurea* | Wet savannahs, pitcherplant bogs |
| *Baptisia lecontei* | Pineland scrub |
| *Befaria racemosa* | Pine flatwoods; pine-oak scrub |
| *Callirhoe triangulata* | Sandy scrub |
| *Calopogon multiflorus* | Wet savannahs; pitcherplant bogs |
| *Calystegia catesbiana ssp. catesbiana* | Longleaf pine-wiregrass savannahs |
| * *Carex dasycarpa* | Evergreen hammocks; bluff forests |
| *Carex decomposita* | Swamps and lake margins on floating logs & stumps |
| *Carex fissa var. aristata* | Wet savannahs |
| *Ceanothus microphyllus* | Longleaf pine-wiregrass savannahs |
| *Cenchrus myosuroides* | Sandy clearings |
| *Cladium mariscoides* | Bogs & marshes |
| *Coreopsis integrifolia* | Floodplain forests, streambanks |
| *Crinum americanum* | Swamps |
| *Eleocharis robbinsii* | Pine savannah ponds |
| *Elytraria caroliniensis* | Floodplain hardwoods; usually calcareous |
| * *Epidendrum conopseum* | Altamaha Grit outcrops, also mesic hardwood or magnolia-beech bluff forests |
| *Eragrostis secundiflora* | Beaches & dunes; sandy soils |

* = State-protected species

## SPECIAL PLANTS OF LOWNDES COUNTY

**This list was compiled in January 1994 and represents both potential and known occurrences of special plants (rare and/or protected in Georgia) for Lowndes County. Source: Georgia Dept. of Natural Resources, Wildlife Resources Division, Gerogia Natural Heritage Program.**

| Plants | Habitat |
|---|---|
| *Eriocaulon texense* | Altamaha grit outcrops; wet pine savannahs |
| *Eryngium aromaticum* | Dry pinelands; longleaf pine-wiregrass savannahs |
| *Eulophia ecristata* | Dry palmetto fields; grassy areas |
| *Fimbristylis decipiens* | Wet pine savannahs |
| *Fimbristylis tomentosa* | Bogs; Granite outcrops |
| * *Fothergilla gardenii* | Openings in low woods; swamps |
| *Fuirena scirpoidea* | Pineland depressions |
| *Galactia floridana* | Pine flatwoods |
| *Glyceria septentrionalis* | Cypress ponds |
| *Gratiola subulata* | Longleaf pine-wiregrass savannahs |
| *Habenaria quinqueseta var. quinqueseta* | Altamaha Grit outcrops; open pine woods |
| *Helianthus agrestis* | Pine savannahs; mucky, wet soils |
| *Helianthus heterophyllus* | Bogs |
| *Hibiscus coccineus* | Marshes; sloughs |
| *Illicium parviflorum* | Evergreen hammocks, bayheads |
| *Ipomoea macrorhiza* | Exposed sandy soils |
| *Krameria lanceolata* | Longleaf pine-wiregrass sandridges |
| *Lachnocaulon beyrichianum* | Flatwoods |
| *Lechea deckertii* | Scrub |
| *Lechea torreyi* | Flatwoods; pond margins; scrub |
| *Leitneria floridana* | Swamps; sawgrass-cabbage palmetto marshes |
| *Listera australis* | Moist rhododendron thickets |
| * *Litsea aestivalis* | Cypress ponds; swamp margins |
| *Lobelia boykinii* | Cypress ponds & wet savannahs |
| *Lophiola aurea* | Pine flatwoods, bogs |
| *Macbridea caroliniana* | Wet savannahs, flatwoods |
| *Macranthera flammea* | Wet, sandy thickets; bogs |
| *Malaxis spicata* | Low hammocks; spring-fed river swamps |
| * *Matelea alabamensis* | Open bluff forests |
| *Matelea flavidula* | Open bluff forests; floodplain forests |
| * *Matelea pubiflora* | Exposed sandy soils; sandridges |
| *Micromeria brownei var. pilosiuscula* | Floodplain forests |
| *Mimosa strigillosa* | Floodplain forests; wet, grassy openings |
| *Myrica inodora* | Bayheads, titi swamps |
| * *Myriophyllum laxum* | Bluehole springs; shallow ponds & whitewater creeks |
| *Oldenlandia boscii* | Cypress pond margins; wet savannahs |
| *Oxypolis ternata* | Wet pine savannahs |

* = State-protected species

## SPECIAL PLANTS OF LOWNDES COUNTY

**This list was compiled in January 1994 and represents both potential and known occurrences of special plants (rare and/or protected in Georgia) for Lowndes County. Source: Georgia Dept. of Natural Resources, Wildlife Resources Division, Gerogia Natural Heritage Program.**

| Plants | Habitat |
|---|---|
| *Palafoxia integrifolia* | Pine-oak scrub |
| *Panicum tenerum* | Wet pine savannahs |
| *Paspalum giganteum* | Flatwoods; wet hammocks |
| *Peltandra sagittifolia* | Swamps; wet hammocks |
| *Pentodon pentandrus* | Wet meadows; pond edges |
| *Phaseolus sinuatus* | Sandhills; dry pinelands & hammocks |
| *Phlebodium aureum* | Exposed calcareous soil; also epiphytic on live oak & sabal palmetto |
| * *Physostegia leptophylla* | Wet savannahs, bogs |
| *Pieris phyllyreifolia* | Cypress ponds; epiphytic on cypress bark |
| *Pinckneya pubens* | Flatwoods; wet, sandy thickets |
| *Plantago sparsiflora* | Marshy pinelands |
| *Platanthera integra* | Wet savannahs, pitcherplant bogs |
| *Platanthera nivea* | Wet savannahs, pitcherplant bogs |
| *Pleea tenuifolia* | Wet pine savannahs; margins of cypress ponds |
| *Polanisia tenuifolia* | Sandridges; scrub |
| *Polygala balduinii* | Wet pine savannahs |
| *Polygala leptostachys* | Oak-pine scrub |
| *Ponthieva racemosa* | Calcareous swamps; marly outcrops |
| *Psilocarya corymbifera* | Floating mats in ponds & pond margins |
| *Psilotum nudum* | Swamp forests & hammocks; usually epiphytic |
| *Pycnanthemum floridanum* | Pine savannahs; flatwoods |
| *Quercus austrina* | Bluff forests; floodplain hammocks |
| *Quercus chapmanii* | Sandridges; dunes; oak-pine scrub |
| *Rhapidophyllum hystrix* | Floodplain terraces and adjacent lower slopes; crests of steep ravines |
| *Rhexia aristosa* | Pond margins & wet savannahs |
| *Rhexia nuttallii* | Pine flatwoods; bogs |
| *Rhododendron austrinum* | Hardwood-spruce pine forests; low woods |
| *Rhynchospora breviseta* | Bogs |
| *Rhynchospora careyana* | Sag ponds; cypress ponds; pine flatwoods |
| *Rhynchospora decurrens* | Swamps |
| *Rhynchospora harperi* | Cypress pond margins & wet savannahs |
| *Rhynchospora macra* | Seepage slopes; wet savannahs |
| *Rhynchospora oligantha* | Bogs |
| *Rhynchospora pleiantha* | Pond margins; wet savannahs |
| *Rhynchospora punctata* | Wet savannahs, pitcherplant bogs |

* = State-protected species

## SPECIAL PLANTS OF LOWNDES COUNTY

**This list was compiled in January 1994 and represents both potential and known occurrences of special plants (rare and/or protected in Georgia) for Lowndes County. Source: Georgia Dept. of Natural Resources, Wildlife Resources Division, Gerogia Natural Heritage Program.**

| Plants | Habitat |
|---|---|
| *Rhynchospora solitaria* | Wet, sandy, peaty depressions |
| *Rhynchospora stenophylla* | Pine savannahs |
| *Rhynchospora torreyana* | Bogs; wet savannahs |
| *Ruellia noctiflora* | Open, pine flatwoods |
| *Sagittaria teres* | Sandy ponds & bogs |
| * *Sarracenia flava* | Wet savannahs, pitcherplant bogs |
| * *Sarracenia minor* | Wet savannahs, pitcherplant bogs |
| * *Sarracenia psittacina* | Wet savannahs, pitcherplant bogs |
| *Sium suave* | Swamps |
| *Solidago tarda* | Sandy upland forests |
| *Spiranthes brevilabris* | Open pinelands; meadows |
| *Spiranthes longilabris* | Wet pinelands & prairies |
| *Spiranthes ovalis* | Moist hammocks; swamp margins; wet thickets over basic soils |
| *Sporobolus teretifolius* | Longleaf pine-wiregrass savannahs |
| *Stillingia aquatica* | Cypress ponds; flatwood ponds & shallow sloughs |
| *Stokesia laevis* | Pitcherplant bogs |
| *Tephrosia chrysophylla* | Scrub; pine flatwoods |
| *Thelypteris ovata* | Calcareous hammocks; limesinks; mesic hardwood forests |
| *Tillandsia bartramii* | Epiphytic in moist forests |
| *Tillandsia setacea* | Epiphytic in bluff forests on evergreen hardwoods |
| *Tillandsia utriculata* | Epiphytic in evergreen hammocks |
| *Tofieldia glabra* | Wet pine savannahs |
| *Utricularia olivacea* | Shallow ponds |
| *Uvularia floridana* | Mixed oak-hickory forests; mesic hardwoods or magnolia-beech bluff forests |
| *Vernonia pulchella* | Pine savannahs; pine flatwoods |
| *Vitis munsoniana* | Floodplain forests; blackwater streamsides |
| *Vitis palmata* | Floodplain forests; river banks |
| *Warea cuneifolia* | Sandhills scrub |
| *Xyris drummondii* | Pine flatwoods |
| *Xyris scabrifolia* | Sedge bogs; pitcherplant bogs; pine flatwoods |
| *Xyris serotina* | Sandy pinelands |
| *Xyris stricta* | Acidic swamps |
| *Zephyranthes simpsonii* | Pine flatwoods |
| *Zigadenus leimanthoides* | Sandhill bogs; pine flatwoods |

* = State-protected species

## EXPLANATION OF RARITY RANKS AND STATUS

The "Global Rank" and "State Rank" columns indicate relative rarity of species at the rangewide or global level and the Georgia or state level, respectively. An explanation of these ranks and of federal and state protection status follows.

STATE [GLOBAL] RANK:

| | | |
|---|---|---|
| S1[G1] | = | Critically imperiled in state [globally] because of extreme rarity (5 or fewer occurrences). |
| S2[G2] | = | Imperiled in state [globally] because of rarity (6 to 20 occurrences). |
| S3[G3] | = | Rare or uncommon in state [rare and local throughout range or in a special habitat] (on the order of 21 to 100 occurrences). |
| S4[G4] | = | Apparently secure in state [globally]. |
| S5[G5] | = | Demonstrably secure in state [globally]. |
| SA | = | Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals. |
| SN | = | Regularly occurring, usually migratory and typically nonbreeding species. |
| SR | = | Reported from the state, but without persuasive documentation. |
| SU[GU] | = | Possibly in peril in state [range-wide] but status uncertain; need more information on threats. |
| SX[GX] | = | Apparently extirpated from state [extinct throughout range]. GXC is known only in cultivation/captivity. |
| SE | = | An exotic established in state; may be native elsewhere in North America; sometimes nativity is difficult to determine (SE?). |
| SH[GH] | = | Of historical occurrence in the state [throughout its range], perhaps not verified in the past 20 years, but suspected to be still extant. |

FEDERAL STATUS:

| | | |
|---|---|---|
| LE | = | Listed endangered. The most critically threatened species. A species that may become extinct or disappear from a significant part of its range if not immediately protected. |

| | | |
|---|---|---|
| LT | = | Listed threatened. The next most critical level of threatened species. A species that may become endangered if not protected. |
| PE or PT | = | Candidate species currently proposed for listing as endangered or threatened. |
| C1 | = | Candidate species presently under status review for federal listing for which adequate information exists on biological vulnerability and threats to list the taxa as endangered or threatened. |
| C2 | = | Candidate species presently under status review for federal listing for which information indicates that listing as endangered or threatened is possibly appropriate, but for which adequate data on biological vulnerability and threats are not currently known or on file to support proposed rules. |
| 3A, 3B, 3C | = | Formerly candidate species; presently delisted. |

STATE STATUS:

The following abbreviations are used to indicate the status of state-protected plants and animals or those proposed for state-protection in Georgia.

| | | |
|---|---|---|
| E | = | Listed as endangered. |
| T | = | Listed as threatened. |
| U | = | Listed as unusual (and thus deserving of special consideration). |
| PE | = | Proposed endangered. |
| PT | = | Proposed threatened. |
| PU | = | Proposed unusual. |

NOTE: This is a working list and is constantly revised. For the latest changes, acknowledgement of numerous sources, interpretation of data, or other information connected with this list, please contact: Georgia Department of Natural Resources, Georgia Natural Heritage Program, 2117 Hwy 278 SE, Social Circle, GA 30279, 706-557-3032 and 404-918-6411.

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Reference 4

27233

# Draft Feasibility Study Addendum
# Operable Unit No. 2

# Woolfolk Chemical Works Site
## Fort Valley, Georgia

Prepared for
**Clean Sites**

for submittal to
**U.S. Environmental Protection Agency, Region IV**

Prepared by CH2M HILL August 1994

CONTENTS

**Operable Unit No. 2 Feasibility Study**


| Chapter | | Page |
|---|---|---|
| | Executive Summary | ES-1 |
| 1 | Introduction | 1-1 |
| | Purpose and Organization of the Report | 1-2 |
| | Site Background Information | 1-2 |
| | Site Description | 1-2 |
| | Site History | 1-3 |
| | Operable Unit No. 1—Groundwater | 1-3 |
| | Previous Remedial Actions | 1-6 |
| | Removal Actions | 1-10 |
| | Soil | 1-14 |
| | Hydrogeology | 1-14 |
| | Scope of Remedial Investigation | 1-16 |
| | Nature and Extent of Contamination | 1-17 |
| | Soil Investigation | 1-17 |
| | Surface Water and Soil/Sediment Investigation | 1-18 |
| | Groundwater Investigation | 1-19 |
| | Building E Investigation | 1-19 |
| | Air Investigation | 1-20 |
| | Contaminant Fate and Transport | 1-21 |
| | Summary of Risk Assessment | 1-24 |
| | Selection of Chemicals of Concern | 1-24 |
| | Exposure Assessment | 1-25 |
| | Health Risk Characterization | 1-26 |
| | Risk Characterization | 1-27 |
| | Risk Characterization for Current Site Worker | 1-29 |
| | Risk Characterization for Current Off-Site Residents | 1-30 |
| | Summary of Risks Under A Future Residential Land-Use Scenario | 1-30 |
| | Risk Assessment Conclusions | 1-32 |
| | Ecological Risk Assessment | 1-34 |
| | Ecological Risk Assessment Conclusions | 1-35 |
| 2 | Remedial Action Objectives and Identification and Screening of Technologies | 2-1 |
| | Introduction | 2-1 |
| | NCP and CERCLA Objectives | 2-1 |


DRAFT

CONTENTS (Continued)


| Chapter | | Page |
|---|---|---|
| 2 (Cont.) | Development of Site-Specific Remedial Action Objectives | 2-3 |
| | Identification of Environmental Media and Operable Unit Groups | 2-3 |
| | Site-Specific Remedial Action Objectives | 2-4 |
| | Applicable or Relevant and Appropriate Requirements | 2-4 |
| | Other Criteria or Guidelines To Be Considered | 2-6 |
| | Determination of ARARs | 2-6 |
| | General Response Actions | 2-8 |
| | On-Site, Off-Site Soil, and Existing Cap | 2-8 |
| | Structures | 2-9 |
| | Stormwater System | 2-10 |
| | Identification and Screening of Technologies and Process Options | 2-12 |
| | Soil | 2-14 |
| | Structures | 2-17 |
| | Stormwater System | 2-20 |
| 3 | Development and Screening of Remedial Action Alternatives | 3-1 |
| | Introduction | 3-1 |
| | Screening of Alternatives | 3-2 |
| | Development of Remedial Action Alternatives | 3-3 |
| | Remedial Action Alternatives: On-Site Soil | 3-4 |
| | Remedial Action Alternatives: Off-Site Soil (Commercial and Residential) | 3-13 |
| | Remedial Action Alternatives: Existing Cap | 3-14 |
| | Remedial Action Alternatives: Structures | 3-20 |
| | Remedial Action Alternatives: Stormwater Sewer | 3-24 |
| 4 | Detailed Analysis of Site-Wide Remedial Alternatives | 4-1 |
| | Introduction | 4-1 |
| | Evaluation Criteria | 4-2 |
| | Protection of Human Health and Environment | 4-2 |
| | Compliance with ARARs | 4-2 |
| | Long-Term Effectiveness and Permanence | 4-2 |


DRAFT

**CONTENTS (Continued)**


| Chapter | | Page |
|---|---|---|
| 4 (Cont.) | Reduction of Toxicity, Mobility, and Volume | 4-3 |
| | Short-Term Effectiveness | 4-4 |
| | Implementability | 4-4 |
| | Cost | 4-5 |
| | State Acceptance | 4-6 |
| | Community Acceptance | 4-6 |
| | Analysis of Site-Wide Alternatives | 4-6 |
| | Alternative 1: No Action | 4-8 |
| | Alternative 2: Land Improvements for Commercial/ Industrial Development | 4-10 |
| | Alternative 3: On-Site Subtitle C Landfill | 4-17 |
| | Alternative 4: S/S Treatment of Hazardous Soil and On-Site Subtitle C Landfill | 4-22 |
| | Alternative 5: In Situ S/S Treatment | 4-28 |
| | Alternative 6: Subtitle C and D Landfills | 4-32 |
| | Alternative 7: S/S Treatment of Hazardous Soil and Off-Site Landfills | 4-36 |
| | Comparative Analysis | 4-39 |
| | Overall Protection of Human Health and the Environment | 4-39 |
| | Compliance with ARARs | 4-40 |
| | Long-Term Effectiveness and Permanence | 4-40 |
| | Reduction of Toxicity, Mobility, or Volume Through Treatment | 4-41 |
| | Short-Term Effectiveness | 4-42 |
| | Implementability | 4-42 |
| | Cost | 4-43 |
| | References | R-1 |

Appendix A: Soil and Sediment Action Levels for the Chemicals of Concern at the Woolfolk Chemical Works Site
Appendix B: Calculation of Groundwater Protection Levels
Appendix C: Preliminary Identification of Action- and Location-Specific ARARs
Appendix D: Soil Management Estimates
Appendix E: Detailed Cost Estimates
Appendix F: Summary and Evaluation of Existing Cap Performance
Appendix G: Calculation of Risks Associated with Remedial Alternatives


DRAFT

CONTENTS (Continued)


| Tables | | Follows Page |
|---|---|---|
| ES-1 | Site-Specific Remedial Action Objectives | ES-1 |
| ES-2 | Soil and Sediment Proposed Target Action Levels | ES-2 |
| ES-3 | Groundwater Protection Levels—Soil Concentrations | ES-2 |
| ES-4 | Components of Alternatives | ES-2 |
| ES-5 | Summary of Alternatives Evaluation | ES-5 |
| 1-1 | Properties Subject to Removal Action | 1-11 |
| 1-2 | Woolfolk RI Soil Results | 1-17 |
| 1-3 | Woolfolk Maximum Air Concentrations | *1-22 |
| 1-4 | Chemicals of Concern | 1-22 |
| 1-5 | Summary of Risk Characterization for Current Site Workers | *1-29 |
| 1-6 | Summary of Risk Characterization for the Future Residential Land-Use Scenario—Surface Soils | *1-30 |
| 1-7 | Summary of Risk Characterization for the Future Residential Land-Use Scenario—Groundwater | *1-31 |
| 2-1 | Site-Specific Remedial Action Objectives | 2-4 |
| 2-2 | Soil and Sediment Proposed Target Action Levels | 2-4 |
| 2-3 | Groundwater Protection Levels—Soil Concentrations | 2-4 |
| 2-4 | Preliminary Screening of Remedial Technologies for Soil (On-Site Soil and Existing Cap) | 2-12 |
| 2-5 | Preliminary Screening of Remedial Technologies for Structures | 2-12 |
| 2-6 | Preliminary Screening of Remedial Technologies for Stormwater System | 2-12 |
| 2-7 | Evaluation of Remedial Process Options for Soil (On-Site Soil and Existing Cap) | 2-14 |
| 2-8 | Evaluation of Remedial Process Options for Structures | 2-17 |
| 2-9 | Evaluation of Remedial Process Options for Stormwater System | 2-20 |
| 3-1 | Site-Specific Remedial Action Alternatives | 3-1 |
| 3-2 | Remedial Action Alternative Screening—On-Site Soil | 3-4 |
| 3-3 | CGC Owned Properties | 3-13 |
| 3-4 | Remedial Action Alternative Screening—Existing Cap | 3-14 |
| 3-5 | Existing Cap Layer Components | *3-15 |
| 3-6 | Remedial Action Alternative Screening—Structures | 3-20 |
| 3-7 | Remedial Action Alternative Screening—Stormwater Sewer System | 3-24 |


DRAFT

CONTENTS (Continued)


| Tables | | Follows Page |
|---|---|---|
| 4-1 | Summary of Alternatives Evaluation | 4-7 |
| 4-2 | Costs for Alternative 2 Land Improvements for Commercial/Industrial Development | 4-16 |
| 4-3 | Costs for Alternative 3 On-Site Subtitle C Landfill | 4-21 |
| 4-4 | Maximum Concentration of Contaminants for the Toxicity Characteristic Leaching Procedure | *4-23 |
| 4-5 | TCLP Results of Treatability Testing | *4-24 |
| 4-6 | Test Mix Ratios | *4-24 |
| 4-7 | Costs for Alternative 4 S/S Treatment of Hazardous Soil and Subtitle C Landfill | 4-27 |
| 4-8 | Costs for Alternative 5 In Situ S/S Treatment | 4-31 |
| 4-9 | Costs for Alternative 6 On-Site Subtitle C and D Landfills | 4-35 |
| 4-10 | Costs for Alternative 7 S/S Treatment of Hazardous Soil and Off-Site Disposal | 4-38 |
| 4-11 | Summary Evaluation of Site-Wide Remedial Alternatives | 4-39 |


*These tables appear on the page indicated.

DRAFT

CONTENTS (Continued)


| Figures | | Follows Page |
|---|---|---|
| 1-1 | Organizational Schematic for Woolfolk FS | 1-2 |
| 1-2 | Location Map | 1-2 |
| 1-3 | Site Plan | 1-2 |
| 1-4 | Remediation Areas of 1986/1987 | 1-7 |
| 1-5 | Off-Site Properties with Arsenic Concentrations Greater than 30 mg/kg | 1-11 |
| 1-6 | Concentrations of Toxaphene in Surface Soil Samples | 1-17 |
| 1-7 | Concentration of Toxaphene in Subsurface Soil Samples From 1 to 4 Feet BGS | 1-17 |
| 1-8 | Concentrations of Total DDD, DDE, and DDT in Surface Soil Samples | 1-17 |
| 1-9 | Concentrations of DDD, DDE, and DDT in Subsurface Soil Samples From 1 to 4 Feet BGS | 1-17 |
| 1-10 | Concentrations of Total BHCs in Surface Soil Samples | 1-17 |
| 1-11 | Concentrations of Total BHCs in Subsurface Soil Samples From 1 to 4 Feet BGS | 1-17 |
| 1-12 | Concentrations of Arsenic in Surface Soil Samples | 1-17 |
| 1-13 | Concentrations of Arsenic in Subsurface Soil Samples From 1 to 4 Feet BGS | 1-17 |
| 1-14 | Concentrations of Arsenic in Subsurface Soil Samples From 4.5 to 8 Feet BGS | 1-17 |
| 1-15 | Concentrations of Lead in Surface Soil Samples | 1-17 |
| 1-16 | Concentrations of Lead in Subsurface Soil Samples From 1 to 4 Feet BGS | 1-17 |
| 1-17 | March 1993 Arsenic Results | 1-18 |
| 3-1 | Preliminary On-Site Soil Alternatives | 3-4 |
| 3-2 | On-Site Soil Management Areas | 3-4 |
| 3-3 | Cap Types, Paved Vehicular Areas for Alternative ON2 | 3-6 |
| 3-4 | Cross Section of On-Site Subtitle C Landfill | 3-6 |
| 3-5 | Cap Types, Paved Vehicular Areas, Alternatives ON3 through ON8 | 3-6 |
| 3-6 | Cross Section of Subtitle D Landfill | 3-10 |
| 3-7 | CGC Owner Properties | 3-13 |
| 3-8 | Preliminary Existing Cap Alternatives | 3-14 |
| 3-9 | Preliminary Structures Alternatives | 3-20 |
| 3-10 | Preliminary Stormwater Sewer Alternatives | 3-24 |
| 3-11 | Location of Stormwater Sewer | 3-24 |


DRAFT

CONTENTS (Continued)


| Figures | | Follows Page |
|---|---|---|
| 4-1 | Components of Site-Wide Alternatives | 4-7 |
| 4-2 | Alternative 2—Components | 4-10 |
| 4-3 | Alternative 3—Components | 4-18 |
| 4-4 | Areas to Screen for Hazardous Waste Soil | 4-22 |
| 4-5 | Alternative 4—Components | 4-25 |
| 4-6 | Alternative 5—Components | 4-28 |
| 4-7 | Alternative 6—Components | 4-32 |
| 4-8 | Alternative 7—Components | 4-36 |


WDCR859/033.WP5

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# Abbreviations and Acronyms

| | |
|---|---|
| AES | Applied Engineering Sciences |
| ARARs | applicable or relevant and appropriate requirements |
| BGS | below grade surface |
| CAMU | Corrective Action Management Unit |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act of 1980 |
| CGC | Canadyne-Georgia Corporation |
| COCs | chemicals of concern |
| 1,2-DCA | 1,2-dichloroethane |
| DDT | dichlorodyphenyl trichloroethane |
| EPA | U.S. Environmental Protection Agency |
| EPD | Environmental Protection Division |
| FS | feasibility study |
| gamma-BHC | Lindane |
| gpm | gallons per minute |
| HI | hazard index |
| HQ | hazard quotient |
| LDRs | land disposal restrictions |
| MCLs | maximum contaminant levels |
| MCLG | maximum contaminant level goals |
| NAAQS | national ambient air-quality standards |
| NCP | National Contingency Plan |
| O&M | operation and maintenance |
| OSHA | U.S. Occupational Safety and Health Administration |
| PCPI | Peach County Properties, Inc. (also known as SURECO) |
| POTW | publicly owned treatment works |
| PPE | personal protective equipment |
| psi | pounds per square inch |
| RCRA | Resource Conservation and Recovery Act |
| Rfd | reference dose |
| RI | remedial investigation |
| RI/FS | remedial investigation/feasibility study |
| RME | reasonable maximum exposure |
| ROD | record of decision |
| S/S | stabilization/solidification |
| SAP | sampling and analysis plan |
| SARA | Superfund Amendments and Reauthorization Act |
| SDWA | Safe Drinking Water Act |
| TC | toxicity characteristic |
| TCDD | 2,3,7,8-tetrachlorodibenzo-p-dioxin |
| TCLP | toxicity characteristic leaching procedure |
| TSDF | treatment, storage, and disposal facility |

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# Abbreviations and Acronyms (Continued)

| | |
|---|---|
| UC | Upper Cretaceous |
| VOC | volatile organic compound |
| Woolfolk site | Woolfolk Chemical Works |
| WWTP | wastewater treatment plant |

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# Executive Summary

A feasibility study (FS) addendum was prepared for the Woolfolk Chemical Works (Woolfolk site) located in Fort Valley, Georgia, to assess cost-effective remedial alternatives for Operable Unit (OU2) items. The alternatives were designed to reduce the toxicity, volume, or mobility of hazardous substances and are consistent with the National Contingency Plan (NCP). The FS was conducted in accordance with the Administrative Order by Consent, U.S. Environmental Protection Agency (EPA) Docket No. 90-350C, executed between Canadyne-Georgia Corporation, and EPA on April 24, 1990.

The OU2 items addressed in this addendum include:

- On-site soil
- On-site capped area
- Structures
- Stormwater sewer system

The FS report comprises four chapters:

- Chapter 1—Introduction
- Chapter 2—Remedial Action Objectives and Technology Screening
- Chapter 3—Development and Screening of Remedial Action Alternatives
- Chapter 4—Detailed Analysis of Alternatives

Site-specific remedial action objectives were developed for the Woolfolk site. These objectives considered both the level of contamination and the potential exposure route for public health and the environment. They also considered the future protection of environmental resources and the minimization of long-term disruption to existing site operations. The site-specific remedial action objectives are presented in Table ES-1. The

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| Table ES-1<br>SITE-SPECIFIC REMEDIAL ACTION OBJECTIVES | |
|---|---|
| On-Site Soil | Limit exposure of workers to on-site soil that contains contaminant concentrations above the proposed target action levels specified in Table ES-2. |
| | Limit off-site migration by stormwater and wind erosion of contaminated on-site soil above proposed target action levels. |
| | Limit leaching of contaminants in on-site soil with contaminant concentrations greater than proposed levels presented in Table ES-3. |
| Off-Site Soil | Limit exposure to off-site soil in residential settings with contaminant concentrations above the proposed target action levels specified in Table ES-2. |
| | Limit exposure to off-site soil in nonresidential settings with contaminant concentrations greater than the proposed target action levels specified in Table ES-2. |
| Structures | Prevent the recontamination of on-site soil from continued operations in buildings that cannot be rehabilitated (Building W). |
| | Prevent direct contact with both building and soil contamination at dioxin concentrations exceeding proposed levels specified in Table ES-2 (Building E). |
| Stormwater/Sediment | Limit direct contact and further migration of sediment containing contaminant concentrations above proposed levels specified in Table ES-2. |

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target action levels referred to in each objective are preliminary and have not been approved by EPA. These action levels are presented in Tables ES-2 and ES-3.

Remedial technologies were screened and those that passed the screening phase were combined to form alternatives that are specific to environmental media. These alternatives were developed to comply with the NCP and to achieve the remedial action objectives. These alternatives were screened on the basis of effectiveness, implementability, and cost. The alternatives that were retained then were combined to form site-specific alternatives.

Seven site-specific alternatives were developed. The major components of each of the alternatives are presented in Table ES-4 and are described below.

Alternative 1—No Action

- This alternative is required by the NCP to serve as baseline. No remedial activities are proposed for this alternative.

Alternative 2—Land Improvements for Commercial/Industrial Development

- Existing concrete and asphalt that is in poor condition would be removed and disposed of at an off-site, Subtitle D landfill.

- Site areas at or above the proposed action levels would be capped with concrete and asphalt.

- The existing cap will continue to be operated; monitoring of the groundwater would occur.

- Building W would be demolished. Any Building E debris contaminated with dioxin will continue to be stored until it could be disposed of. All other building debris would be disposed of at an off-site Subtitle D landfill.

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**Table ES-2**
**SOIL AND SEDIMENT**
**PROPOSED TARGET ACTION LEVELS**

| Contaminant | Concentrations (mg/kg) |
|---|---|
| On-Site Soil[1] | |
| Arsenic | 300+ and 100 |
| Lead | 500 |
| Toxaphene | 55* |
| Dieldrin | 4* |
| 4,4-DDT | 200* |
| 2,3,7,8-TCDD equivalent (Building E Soil) | 0.0005** |
| Lindane | 63* |
| Off-Site Soil—Residential | |
| Arsenic | 30++ |
| Lead | 500 |
| Toxaphene | 7++ |
| Lindane | 7* |
| 4,4-DDT | 24++ |
| 4,4-DDE | 24++ |
| Dieldrin | 0.5++ |
| Pentachlorophenol | 70++ |
| Off-Site Soil—Commercial or Redevelopment Area | |
| Arsenic | 100 |
| Lead | 500 |
| Lindane | 63* |
| Sediment[2] | |
| Arsenic | 100 |
| Lead | 500 |
| Toxaphene | 130* |
| Lindane | 110* |

Notes:
*Concentration is based on the risk evaluation (see Appendix A) because the groundwater protection level is higher (see Appendix B and Table 2-3).
**Value is based on 2,3,7,8-TCDD equivalent (see Appendix A).
[1]The on-site soil proposed target action levels, unless otherwise noted, are based on the $1 \times 10^{-5}$ cancer risk for an adult worker under the RME exposure scenario (see Appendix A).
[2]Sediment proposed target action levels are based on the $1 \times 10^{-5}$ cancer risk for a child resident under the RME exposure scenario (see Appendix A).
+For paved areas based on cleanup level developed by EPA for off-site soil removal activities on paved industrial/commercial areas.
++Residential level established for EPA for off-site soil removal activities (surface soil).

All levels presented in this table are preliminary and have not been approved by EPA.

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| Table ES-3<br>GROUNDWATER PROTECTION LEVELS—<br>SOIL CONCENTRATIONS | |
|---|---|
| **Contaminant** | **Concentration (mg/kg)** |
| Arsenic | 454 |
| Lead | 623 |
| Lindane | Well above soil ingestion level of 7 |
| Toxaphene | 6,110 |
| 1,2-Dichloroethane | 17 |

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## Table ES-4
## COMPONENTS OF ALTERNATIVES

| Alternative | Land Improvements | Stormwater System Decontamination | Demolition of Structures | On-Site Landfilling | Off-Site Landfilling | Soil Treatment | Excavation of Existing Cap |
|---|---|---|---|---|---|---|---|
| 1 | - | - | - | - | - | - | - |
| 2 | x | x | x | - | x | - | - |
| 3 | x | x | x | x | - | - | - |
| 4 | x | x | x | x | - | x | - |
| 5 | x | x | x | x | - | x | - |
| 6 | x | x | x | x | - | - | x |
| 7 | x | x | x | - | x | x | x |

Notes:
x = Component included in the alternative.
- = Component not included in the alternative.

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- The on- and off-site stormwater system would be decontaminated.

Alternative 3—On-site Subtitle C Landfill

- On-site soil at or above the proposed action levels would be excavated and disposed of in a Subtitle C landfill on the Woolfolk site.

- The existing cap will continue to be operated; monitoring of the groundwater would occur.

- Building W would be demolished. Building E debris contaminated with dioxin will continue to be stored until it could be disposed of. All other building debris would be disposed of in a Subtitle C landfill on the Woolfolk site. Dioxin-contaminated soil would be excavated and stored with the Building E debris.

- The on- and off-site stormwater system would be decontaminated.

Alternative 4—Stabilization/Solidification (S/S) Treatment of Hazardous Soil and On-site Subtitle C Landfill

- On-site soil at or above the proposed action levels would be excavated and disposed of in a Subtitle C landfill on the Woolfolk site. Soil determined to be hazardous by TC would be treated by S/S before disposal.

- The existing cap, buildings W and E, and stormwater system components would be treated in the same manner as in Alternative 3.

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Alternative 5—In Situ S/S Treatment

- On-site soil at or above the proposed action levels would be treated using in situ or ex situ S/S treatment. Soil treated ex situ would be disposed in an on-site Subtitle D landfill.

- All other alternative components are the same as Alternative 2.

Alternative 6—On-site Subtitle C and D Landfills

- On-site soil determined to be hazardous by TC would be disposed of in an on-site Subtitle C landfill. The remaining soil at or above the proposed action levels would be disposed of in an on-site Subtitle D landfill.

- The material under the existing cap would be excavated and then disposed of in the on-site Subtitle C landfill.

- Buildings W and E, and stormwater system components would be the same as Alternative 3.

Alternative 7—S/S Treatment of Hazardous Soil and Off-Site Landfill

- On-site soil at or above the proposed action levels would be excavated and disposed of in an off-site Subtitle C landfill. Soil determined to be hazardous by TC would be treated using S/S before disposal.

- The existing cap would be excavated, treated using S/S, and disposed of in an off-site Subtitle C landfill.

- Building W would be demolished. Building E debris contaminated with dioxin will continue to be stored until it could be disposed of. All other

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building debris would be disposed of in a off-site Subtitle D landfill. Dioxin-contaminated soil would be stored with the Building E dioxin-contaminated debris.

- Stormwater system alternative components would be the same as Alternative 3.

Each of these alternatives were evaluated on the basis of seven criteria. A summary of the evaluation is presented on Table ES-5. The cost estimates presented have an accuracy of +50 percent to -30 percent. The alternative cost estimates are in 1994 dollars and are based on conceptual design information available at the time of this study. The actual cost of the project would depend on the final scope and design of the selected remedial action, the schedule of implementation, competitive market conditions, and other variables. Most of these factors are not expected to affect the relative cost differences between alternatives.

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Table ES-5
SUMMARY OF ALTERNATIVES EVALUATION

| Evaluation Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/ Industrial Development | Alternative 3 On-Site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-Site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-Site Hazardous and Subtitle D Landfills | Alternative 7 S/S Treatment of Hazardous Soil and Off-Site Landfills |
|---|---|---|---|---|---|---|---|
| Protects Human Health and Environment | No protection from present contamination levels. | Yes. | Yes. | Yes, but short-term risk, exceed long-term risks. | Yes, but short-term risk exceed long-term risks. | Yes, but short-term risks exceed long-term risks. Short-term risk close to exceeding EPA's acceptable risk range. | Does not meet statutory preference for onsite actions. Highest short-term risks. Not protective since short-term risk outside EPA acceptable range. |
| Complies with ARARs | No. | Yes. | Yes. | Yes. | Yes. | Yes. | Yes. |
| Long-Term Effectiveness and Permanence | Long-term risk remains at current levels or would worsen. | Yes. | Yes. | Yes. | Yes. | Same as Alternative 3. | Yes. |
| Reduces Toxicity, Mobility, and Volume | None. | Soil<br>Toxicity - No<br>Mobility - Yes<br>Volume - No | Soil<br>Toxicity - No<br>Mobility - Yes<br>Volume - No | Soil<br>Toxicity - No<br>Mobility - Yes<br>Volume - Increases Volume | Same as Alternative 4, but significantly greater volume increase. | Same as Alternative 3. | Same as Alternative 4. |
| Short-Term Effectiveness in Reducing Exposure | Workers - No Change<br>Residents - No Change | Workers - High<br>Residents - High | Workers - Medium<br>Residents - Medium | Workers - Low<br>Residents - Medium | Lower than Alternative 4. | Lower than Alternative 5. | Lowest, with short-term risks outside of EPA risk range. |
| Implementable | Not applicable. | Yes. | Yes. | Yes. | More difficult to control than ex-situ process. Buried utilities make implementation more difficult. | Yes. | Yes, but traffic would increase significantly requiring extensive planning and coordination. |
| Cost (Present Worth) | $0 | $4,200,000 | $5,300,000 | $8,900,000 | $12,600,000 | $6,200,000 | $28,000,000 |

Note: Groundwater treatment will occur as part of the OU1 remedy, reducing overall site risk.

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## Chapter 1
# Introduction

A feasibility study (FS) addendum was prepared for the Woolfolk Chemical Works (Woolfolk site) located in Fort Valley, Georgia, to assess cost-effective remedial alternatives for Operable Unit 2 (OU2) items. The OU2 items addressed in this addendum include:

- On-site soil
- On-site capped area
- Structures
- Stormwater sewer system

The alternatives were designed to reduce the toxicity, volume, or mobility of hazardous substances and are consistent with the National Contingency Plan (NCP). The FS was conducted in accordance with the Administrative Order by Consent, EPA Docket No. 90-350C, executed between Canadyne-Georgia Corporation (CGC), and the U.S. Environmental Protection Agency (EPA) on April 24, 1990.

The Woolfolk site items that are not addressed in this FS addendum include:

- Groundwater
- Off-site soil
- Sediment in stormwater channel
- Building E demolition

Groundwater was addressed in the December 1993 FS. EPA issued a record of decision (ROD) titled *Operable Unit #1: Groundwater Contamination* on March 25, 1994. The

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remaining three items have either been remediated or will be remediated as part of the ongoing removal activities. Each of these items will be discussed later in this chapter.

## Purpose and Organization of the Report

This FS report documents the analyses and evaluations used to develop OU2 remedial action alternatives for the Woolfolk site. The information will be used by EPA to select a cost-effective remedial alternative that complies with the requirements of the National Contingency Plan (NCP). The NCP states that a remedy is cost-effective if its costs are proportional to its overall effectiveness [40 *CFR* 300.430(e)].

The FS report is not intended to be a design document; rather, it gives a conceptual overview of alternatives to evaluate their feasibility. The report discusses criteria used to evaluate remedial technologies and to determine the effects of implementing them. The organization of the report and the process by which remedial technologies and alternatives were assembled and screened are illustrated by Figure 1-1.

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## Site Background Information

### Site Description

The Woolfolk site, which is the site of pesticide formulation and production operations, is located at Preston, Pine, Railroad, and M. L. Luther King Jr. streets in Fort Valley, Georgia (Figure 1-2). The site includes 18 acres of the former Woolfolk Chemical Works (Figure 1-3). Businesses operating on the property of the Woolfolk site include companies owned by Peach County Properties, Inc. (PCPI, also known as SURECO), Georgia Ag Chem, and the Marion Allen Insurance and Realty Company. PCPI continues to

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**CHAPTER 1**

**Introduction**

- Purpose of FS report
- Nature and extent of contamination
- Summary of risk assessment

**CHAPTER 2**

**OU 2 Remedial Action Objectives and Technology Screening**

- Identify CERCLA/SARA and NCP goals
- Identify site-specific remedial action objectives
- Identify ARARs
- Prelimninary screening of remedial technologies
- Final screening of remedial technologies

**CHAPTER 3**

**Development and Screening of OU 2 Remedial Action Alternatives**

- Develop OU 2 remedial action alternatives for:
  - on-site soil
  - on-site cap
  - structures
  - stormwater sewer system
- Screen OU 2 remedial action alternatives on the basis of:
  - effectiveness
  - implementability
  - cost

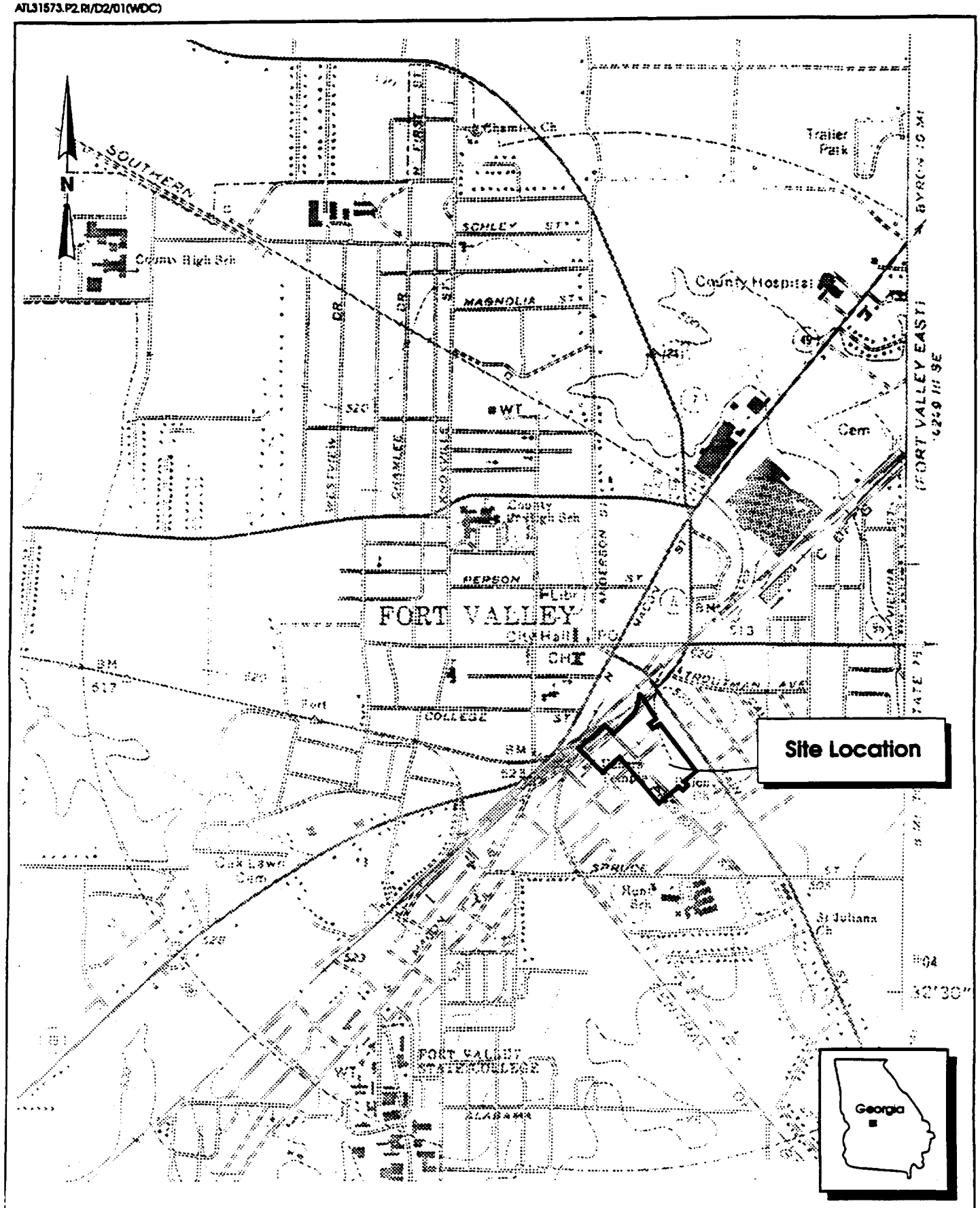
**CHAPTER 4**

**Detailed Analysis of OU 2 Alternatives**

- Assemble OU 2 site-wide remedial action alternatives
- Evaluate OU 2 site-wide remedial action alternatives in terms of:
  - short-term effectiveness
  - long-term effectiveness
  - reduction of toxicity, mobility, and volume
  - protection of human health
  - implementability
  - cost
  - compliance with ARARs

**Figure 1-1**
ORGANIZATIONAL SCHEMATIC FOR WOOLFOLK OU 2 FS

CH2M HILL




0 ½ Miles

Source: USGS Topographic Quadrangle, Fort Valley West, Georgia, 1985

**Figure 1-2**
LOCATION MAP

CH2M HILL

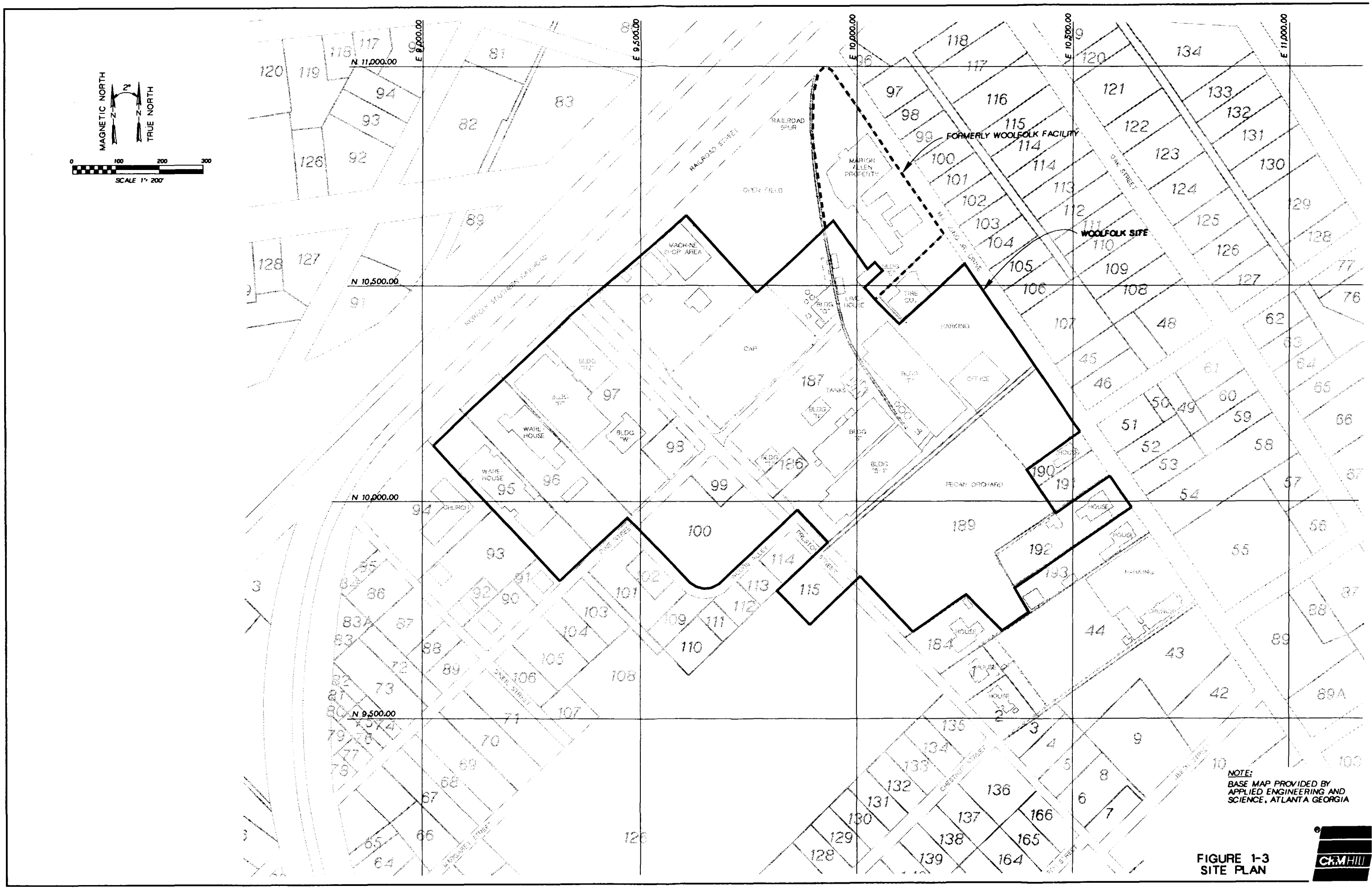



FIGURE 1-3
SITE PLAN

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formulate, package, and warehouse various organic pesticides that are used primarily in the lawn and garden market but also by peach growers.

The Woolfolk site is located in an area with mixed commercial and residential uses. Residences are located to the west and east of the site, and homes adjoin a pecan orchard to the southeast. Several businesses and light industries are located along the north and east ends of the site.

## Site History

Throughout its history, the Woolfolk site has been used for the production and packaging of organic and inorganic insecticides (including arsenic and lead-based products), pesticides, and herbicides. During World War II an inorganic intermediate (arsenic trichloride) was reportedly produced at the site for the War Production Board. Production was expanded during the 1950s to include the formulation of various organic pesticides, including dichlorodiphenyltrichloroethane (DDT), lindane, toxaphene, and other chlorinated pesticides. These organic pesticides and other insecticides and herbicides were formulated, packaged, or warehoused at the site.

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## Operable Unit No. 1—Groundwater

Groundwater samples were collected from monitoring wells screened in the surficial aquifer, surficial perching unit, the Upper Cretaceous (UC) water table aquifer, the UC confined aquifer, and the Tuscaloosa aquifer.

### *Surficial Aquifer and Surficial Perching Unit*

The groundwater samples from the monitoring wells in the surficial aquifer and surficial perching unit indicated the presence of pesticides. Pesticides detected included alpha-, beta-, and gamma-BHC (lindane), DDT, and endosulfan I. Lindane was detected most

frequently, and values ranged from below detection to 0.0083 mg/l. No pesticides were detected in upgradient wells.

Trace metals were detected in 8 of the 11 wells sampled. The highest levels of arsenic and chromium were 5.92 mg/l and 0.1 mg/l, respectively. The highest level of lead detected was 0.023 mg/l.

The most common volatile organic compound (VOC) was 1,2-dichloroethane (1,2-DCA), which was detected in 5 of the 11 wells sampled. Concentrations of 1,2-DCA ranged from 0.002 to 0.2 mg/l.

### *Upper Cretaceous Water Table Aquifer*

The groundwater samples from the monitoring wells in the UC water table aquifer indicated that pesticides were present in several wells. Pesticides detected were the same as in the surficial aquifer sampling, but in a smaller percentage of wells. The highest concentration of lindane was 0.016 mg/l.

The highest concentration of arsenic and one of the highest concentrations of chromium were detected in this aquifer. The highest chromium concentration (0.15 mg/l), the highest cadmium concentration (0.45 mg/l), and one of the highest lead concentrations were detected in a downgradient well.

The contaminant 1,2-DCA also was detected in the UC water table aquifer, with the highest level detected of 0.09 mg/l.

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### *Upper Cretaceous Confined Aquifer (Horizon 3)*

The groundwater samples from the monitoring wells in the UC confined aquifer (Horizon 3) showed pesticides in five of the seven wells. Lindane levels ranged from below detection to 0.0015 mg/l.

No arsenic was detected in this aquifer. The highest chromium concentration (0.36 mg/l) was detected, and the highest lead concentration (0.03 mg/l) also was detected.

The highest concentration of 1,2-DCA was 0.0043 mg/l. Tetrachloroethane was detected in two wells at 0.011 mg/l and 0.004 mg/l.

### *Tuscaloosa Aquifer*

Pesticides, arsenic, and chromium were not detected in the groundwater samples collected from the Tuscaloosa aquifer wells. No contaminants were detected in the City of Fort Valley municipal water supply wells. Lead was detected in three of the five Tuscaloosa wells at less than 0.006 mg/l. 1,2-DCA was detected in two of the Tuscaloosa wells, with a maximum concentration of 0.0019 mg/l.

### *OU1 Record of Decision*

On the basis of the data generated during the remedial investigation and the groundwater alternatives developed in the December 1993 FS, EPA issued a ROD on March 25, 1994. The major components of the selected groundwater remedy include:

- Further delineation of the extent and extraction of contaminated groundwater from the surficial, UC water table, and UC confined aquifers.

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- Treatment of the groundwater using iron coprecipitation and sand filtration with activated carbon adsorption as polishing steps, if needed.

- Discharge to a publicly owned water treatment works (POTW) with a contingency plan to include a National Pollutant Discharge Elimination System (NPDES) permit for surface water discharge or possibly an infiltration gallery should an NPDES permit be unattainable.

- Institutional controls, such as deed restrictions limiting the use of groundwater at the site until performance goals are met.

- Groundwater monitoring of specific wells, including the city wells, to be further defined during remedial design/remedial action (RD/RA) and abandonment of all other monitoring wells used during the RI/FS.

- Operation and maintenance of the full system to be defined by an O&M plan developed during the remedial design.

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## Previous Remedial Actions

In September 1986, CGC began an interim, voluntary soil remediation at the Woolfolk site, with Applied Engineering Sciences (AES) serving as construction manager. The major remediation activities, which were voluntarily funded by CGC, consisted of demolishing several buildings and excavating approximately 3,700 cubic yards of soil contaminated with arsenic and lead (a combined lead and arsenic concentration of >10,000 mg/kg). All soil with contamination levels above this concentration was disposed of at a permitted hazardous waste landfill in Emelle, Alabama. CGC informed the Georgia Environmental Protection Department (EPD) of the investigations and cleanup activities. In August 1987, AES submitted a document to EPD titled "Cleanup Report for the Former Woolfolk

Chemical Works Plant Facility." The report summarized remedial activities conducted at the site. The remediation involved several areas (Figure 1-4) discussed briefly below.

- **Area 1**

  Lead arsenate and calcium arsenate historically were formulated, packaged, and stored in a building in Area 1 (Figure 1-4). In 1986, the building was demolished, and the resulting debris was disposed of in a permitted hazardous waste landfill in Emelle, Alabama. Soil remediation in the area of the demolished building also was performed by CGC. Soil was excavated from 1 to 20 feet below ground surface (BGS) in the area below and adjacent to the location of the former building. Soil with combined arsenic and lead concentrations exceeding 10,000 mg/kg either was taken to Emelle, Alabama, or placed below a Resource Conservation and Recovery Act-(RCRA-)type, multilayer cap, which was installed over Area 1. Lime-sulfur sludge also excavated from behind the lime-sulfur building was placed below the cap.

- **Area 1a**

  Area 1a is a small area north of Area 1 between the railroad tracks and the northwest property line. The area formerly was used to stockpile lime-sulfur sludge. This sludge was removed and placed below the cap in Area 1. Soil from the area beneath the lime-sulfur sludge stockpile that was contaminated with levels of lead or arsenic exceeding 10,000 mg/kg was excavated to depths of as much as 7 feet BGS. The contaminated soil was disposed of in the landfill in Emelle, Alabama. The area was restored to current grade with clean soil.

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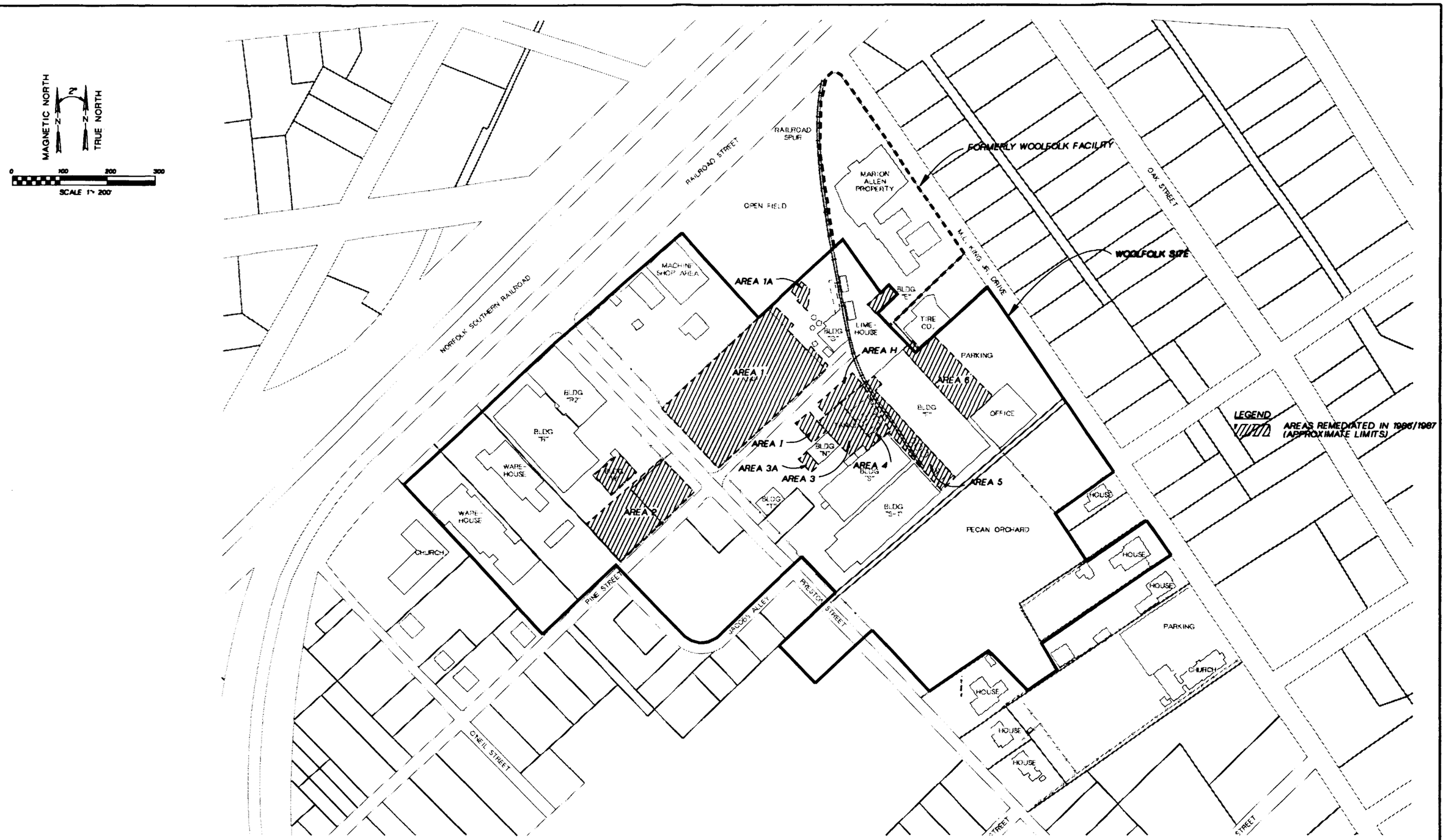


NOTE:
BASE MAP PROVIDED BY APPLIED ENGINEERING AND SCIENCE, ATLANTA GEORGIA

FIGURE 1-4
REMEDIATION AREAS OF 1986/1987

CH2M HILL

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- **Area 2**

Area 2 is located southeast of Building W along Pine Street. A structure used as an organic pesticide-packaging facility (Building P) once stood on a portion of Area 2. A hand-dug well, at least 10 feet deep, also was discovered in this area. This hole was backfilled with clay. Soil in this area having arsenic or lead concentrations exceeding 10,000 mg/kg was removed to a depth of 1 foot BGS and disposed of in the Emelle, Alabama, landfill. Clean backfill was used to fill the excavation to current grade.

- **Area 3**

Area 3 is located northeast of Building N. The remediation of Area 3 consisted of the removal of soil to 1 foot BGS. In addition, one 30- by 30-foot area by the tank farm was excavated to 3 feet BGS. Another hand-dug well, approximately 4 feet square by 16 feet deep, was discovered and filled with neat cement grout. The area was restored to current grade with clean soil.

- **Area 3a**

Area 3a is located on the southwest side of Building S by the loading dock used for shipping. This area was excavated to about 1 foot BGS. Clean backfill was used to fill the excavation to current grade.

- **Area 4**

Area 4 is within a tank farm currently used by PCPI. Soil was removed from 1 to 3 feet BGS. Clean backfill was used to fill the excavation to current grade.

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- **Area 5**

  Area 5 is located east of the tank farm and Building S. It is currently used as an organic pesticide and kaolin unloading area. Soil from this area was removed to 1 foot BGS and disposed of at the Emelle, Alabama, landfill. The area was restored to current grade with clean soil.

- **Area 6**

  This former drum staging area is located northeast of Building F. Soil was removed from 1 to 2 feet BGS in Area 6. The area was restored to current grade with clean soil.

- **Area H**

  This area, where Building H once stood, was excavated to a depth of 1 foot BGS. The area was restored to current grade with clean soil.

- **Building I Area**

  This area, where Building I once stood, is a small area on the north side of Building J, beside a loading dock. This area was excavated to 1 foot BGS. Clean backfill was used to fill the excavation to current grade.

- **Building W Area**

  The soil beneath Building W was excavated to a depth of 1/2 to 1 foot BGS. Clean backfill was used to fill the excavation to current grade.

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- **Other Actions**

  Other remedial actions taken at the site included diverting storm water around Building W, sealing the crawl space of Building E, and securing Building E from unauthorized access.

  Soil from borrow areas in the vicinity of Fort Valley was used as fill soil for the excavations. This soil was analyzed and determined to be nonhazardous prior to use at the site.

  During the remedial activities, soil sampling and analysis were performed in postexcavation areas and at other areas suspected of having contamination. Results of this sampling were presented in the AES report to EPD in August 1987.

## Removal Actions

### *Off-site Soil Removal Activities*

In December 1993, the EPA issued a Unilateral Administrative Order (UAO) for removal activities. The scope of the UAO included:

- "Disassociation of residents" from residential properties,
- excavation/restoration for vacant properties,
- excavation and/or paving of road rights-of-way,
- fencing or fencing repair of commercial/industrial properties,
- removal of sediments and soil from the ditch area, and
- demolition of Building E.

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The UAO specified two options for the "disassociation of residents" from areas where soil cleanup levels were exceeded. The first option was the temporary relocation of residents and excavation of soil that exceeded action levels and restoration of properties. The second option was the purchase of properties, permanent relocation of residents and fencing as an interim measure. Properties purchased under this second option would be subject to a future remediation decision based on a community-based land use decision. Figure 1-5 shows the EPA soil sampling results before the cleanup of the residential properties. Table 1-1 lists the off-site properties addressed by the UAO.

The UAO specified the action levels for surface soil in residential areas. These action levels are:

| Constituent | Level (mg/kg) |
|---|---|
| Arsenic | 30. |
| 4,4-DDE | 24. |
| 4,4-DDT | 24. |
| Dieldrin | 0.5 |
| Toxaphene | 7. |
| Pentachlorophenol | 70. |

The action levels for subsurface soil (i.e., soil below 2 feet) were based on groundwater protection levels. In February 1994, the EPA established the action level for paved road rights-of-way in industrial areas as 300 mg/kg for arsenic. The EPA also established in February 1994 in its Action Memo for proposed removal action for the site, action levels for subsurface soil (at or below 2 feet) of 300 mg/kg for arsenic and 100 mg/kg for total organochlorine pesticides. In April 1994, action levels were established by the EPA for surface soil in crawl spaces under houses as 220 mg/kg for arsenic and 310 mg/kg for toxaphene.

As of July 1994, ten residential properties with houses or apartment units have been completed. Approximately 6,100 tons of soil, debris, and vegetation have been removed

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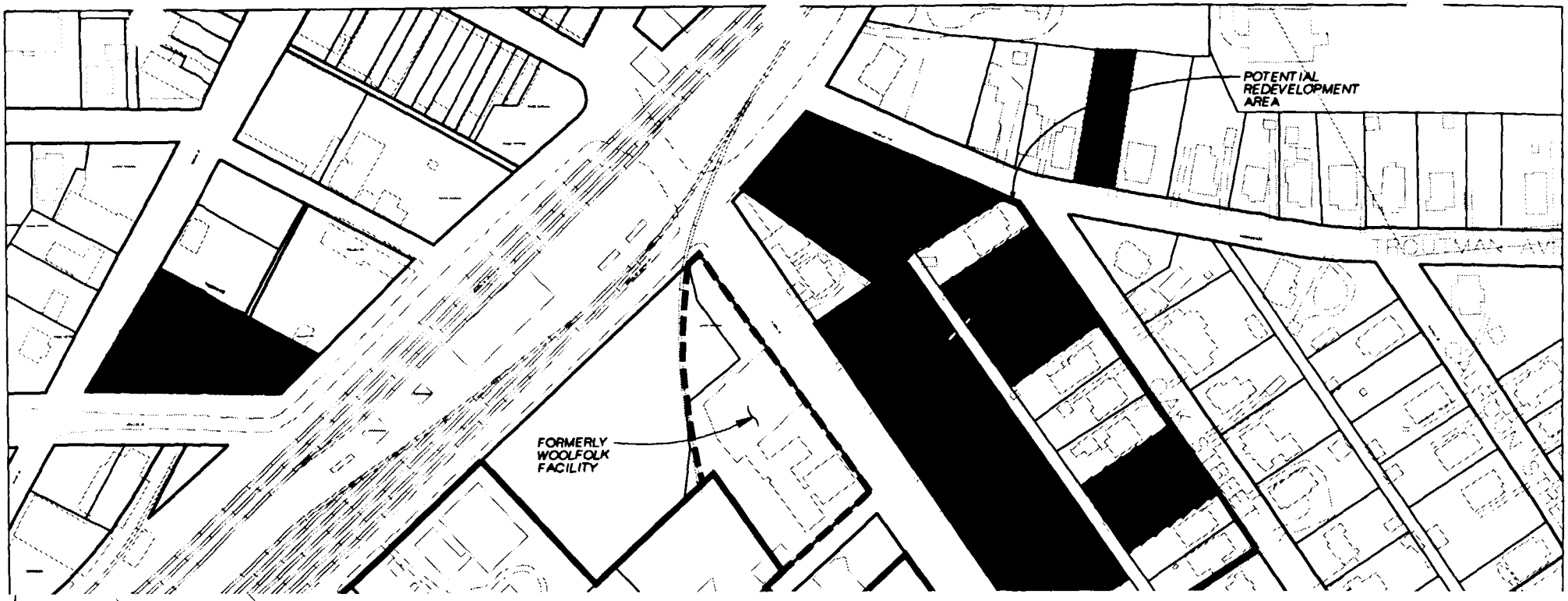


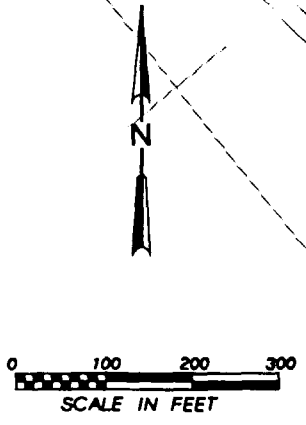


FIGURE 1-5
OFF SITE PROPERTIES
WITH ARSENIC CONCENTRATIONS GREATER
THAN 30 mg/kg (PRIOR TO REMOVAL ACTIONS)

CH2M HILL

**Table 1-1**
**PROPERTIES SUBJECT TO REMOVAL ACTION AS OF JULY 1994**



| Address | Status | Dwelling |
|---|---|---|
| 407 Pine | Completed | Yes |
| 400 Pine | Completed | Yes |
| 301 Pine | Completed | Yes |
| 107 Jacob's Alley | Completed | Yes |
| 107 O'Neil | Completed | Yes |
| 109 O'Neil | Completed | Yes |
| 300 Preston | Completed | Yes |
| 313 Preston | Completed | Yes |
| 315 Preston | Completed | Yes |
| 317 Preston | Completed | Yes |
| 703 Spruce | To Be Completed | Yes |
| 327 M.L. King, Jr. Drive | To Be Completed | Yes |
| 328 M.L. King, Jr. Drive | To Be Completed | Yes |
| 203 Troutman | To Be Completed | Yes |
| Four Jacob's Alley Lots | Completed | No |
| 503 Pine Street | Completed | No |
| Lot next to 400 M.L.King | To Be Completed | No |
| Ballfield on Preston Street | Completed | No |
| Pine Street Rights-of-way | Completed | No |
| Preston Street Rights-of-way | To Be Completed | No |
| Ditch Area South of Spruce St. | To Be Completed | No |
| 302-306 Preston Street | Purchased-On Site | Structures Demolished |
| 201 Pine Street | Purchased-On Site | Structures Demolished |

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**Table 1-1**
**PROPERTIES SUBJECT TO REMOVAL ACTION AS OF JULY 1994**



| Address | Status | Dwelling |
|---|---|---|
| 103 Jacob's Alley | Purchased-Completed | Structures Demolished |
| 400 M.L. King, Jr. Drive | Purchased-On Site | Converted to Commercial Use |
| 327 M.L. King, Jr. Drive | Purchased | Converted to Commercial Use |
| 201 Com. Hts. Pkwy | Purchased | Converted to Commercial Use |
| 202 Oak | Purchased | Converted to Commercial Use |
| 204 Oak | Purchased | Converted to Commercial Use |
| 216 Oak | Purchased | Converted to Commercial Use |
| 218 Oak | Purchased Option | Converted to Commercial Use |
| 305 M.L. King, Jr. Drive | Purchased Option | Converted to Commercial Use |
| 307 M.L. King, Jr. Drive | Purchased Option | Converted to Commercial Use |
| 309 M.L. King, Jr. Drive | Purchased Option | Converted to Commercial Use |
| 311 M.L. King, Jr. Drive | Purchased | Converted to Commercial Use |
| 313 M.L. King, Jr. Drive | Purchased | Converted to Commercial Use |
| 315 M.L. King, Jr. Drive | Purchased Option | Converted to Commercial Use |
| 317 M.L. King, Jr. Drive | Purchased | Converted to Commercial Use |
| 319 M.L. King, Jr. Drive | Purchased | Converted to Commercial Use |
| 321 M.L. King, Jr. Drive | Purchased | Converted to Commercial Use |
| 323 M.L. King, Jr. Drive | Purchased Option | Converted to Commercial Use |

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from these ten properties. Four residential properties with houses are anticipated to be remediated including one property on Spruce Street, one property on Troutman Street, and two properties on Martin Luther King, Jr. Drive. Approximately 800 tons of soil, debris, and vegetation will be removed from these properties.

Five vacant lots including one lot owned by CGC on Jacob's Alley have been restored with excavation of approximately 2,000 tons of material. The former ball field area on Preston Street has also been restored with excavation of approximately 1,050 tons of materials. Street rights-of-way along Pine and Preston Streets have been completed with approximately 3,000 tons of soil removed as "nonhazardous waste" and approximately 600 tons of soil removed and disposed of as "hazardous waste." One additional vacant lot will be completed with approximately 200 tons of soil to be removed.

An additional 1,000 tons of soil will be removed from the road shoulder area on the west side of Preston Street, south of the former Woolfolk site. Much of this soil is backfill placed during the installation of the storm sewer that replaced the ditch between Railroad Street and Spruce Street in the 1970's. Soil sampling during the removal action has indicated that the backfill has elevated levels of arsenic as high as 2,460 mg/kg.

Of the properties purchased by CGC, six dwellings on three properties were demolished. Most of these dwellings were in substandard condition. One property located at 103 Jacob's Alley was remediated to below the soil action levels. Approximately 700 tons of soil and debris have been removed from the CGC-owned properties.

There are 15 properties on the east side of Martin Luther King, Jr. Drive that are anticipated to be converted to commercial land-use as part of the community-based redevelopment project. The redevelopment area is shown on Figure 1-5.

Two properties with dwellings on Martin Luther King, Jr. Drive are beyond the area subject to redevelopment. Both these properties are in areas zoned for commercial use and are below soil action levels for commercial properties. These two properties will be

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converted to permanent commercial use. The commercial property at 400 Martin Luther King. Jr. Drive is adjacent to the pecan orchard and will be used as part of the OU1 implementation. The two vacant lot properties owned by CGC on Preston Street will also be used to support OU1 (Groundwater) and OU2 activities. These two properties will be permanently restricted from use as residential properties.

The ditch area south of the site past Spruce Street will be remediated. An estimate of the quantity of material cannot be made at this time. Soil and sediment sampling during the removal action has shown elevated levels of arsenic in ditch channel, ditch side walls, and flood plain. Approximately one-third of the sampling locations had arsenic concentrations above 100 mg/kg. Additional sampling of properties near the ditch was conducted by the EPA in July 1994. This sampling round may result in additional properties needing remediation under the removal action.

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### *Building E*

In January 1994 under a removal action, building demolition began by first removing small containers of stored pesticides from the building. A containment building was then erected around the building to be demolished. Other nonhazardous building contents were vacuumed clean, tested, and disposed of offsite as nonhazardous wastes. Next, the interior of the building was pressure washed and tested. Most of the corrugated metal and wooden wall and roof framing was then disposed of offsite as nonhazardous wastes. Some of these materials that could not be decontaminated are currently stored in an onsite ISO sea/land container waiting future availability of an offsite disposal site that is permitted for debris contaminated with dioxins and arsenic. The container is 8 feet high, 8 feet wide, by 40 feet long, and sits on a concrete pad with a roof and a fence.

After demolition of the building, the containment structure was removed and the area of the former building was fenced and paved. All work was completed between January and March 1994.

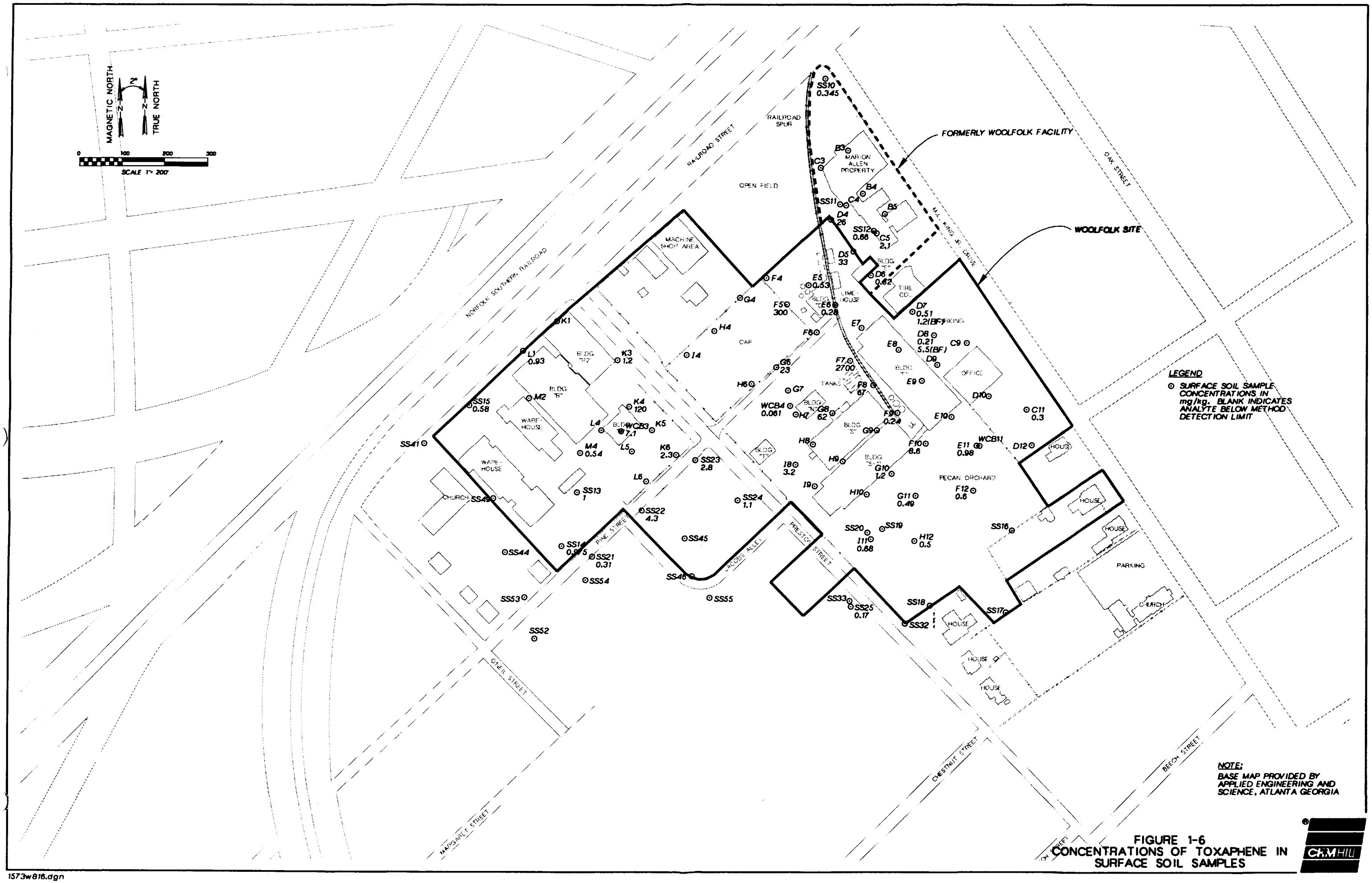


FIGURE 1-6
CONCENTRATIONS OF TOXAPHENE IN SURFACE SOIL SAMPLES

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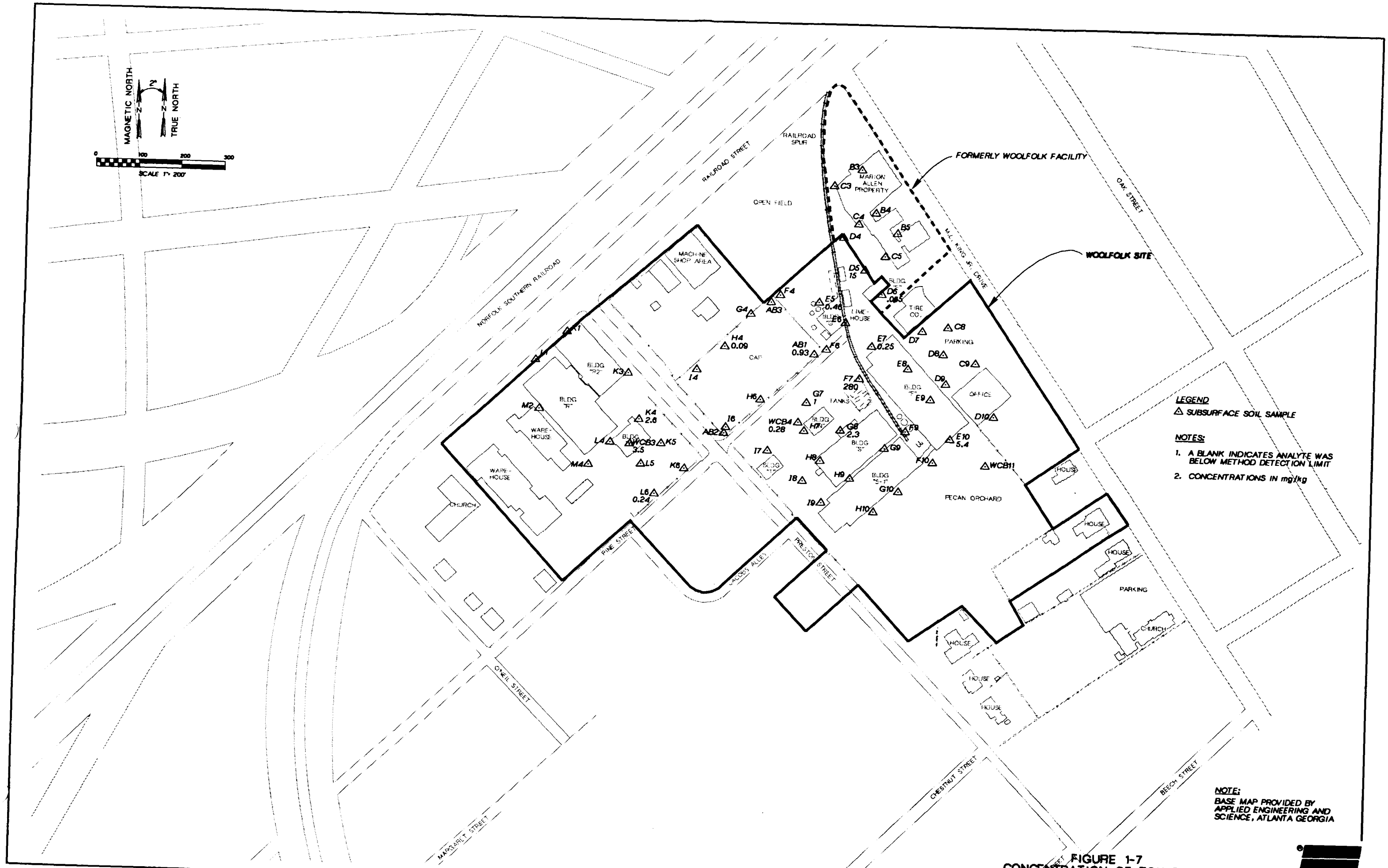


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FIGURE 1-7
CONCENTRATION OF TOXAPHENE
IN SUBSURFACE SOIL SAMPLES FROM 1 TO 4 FEET BGS

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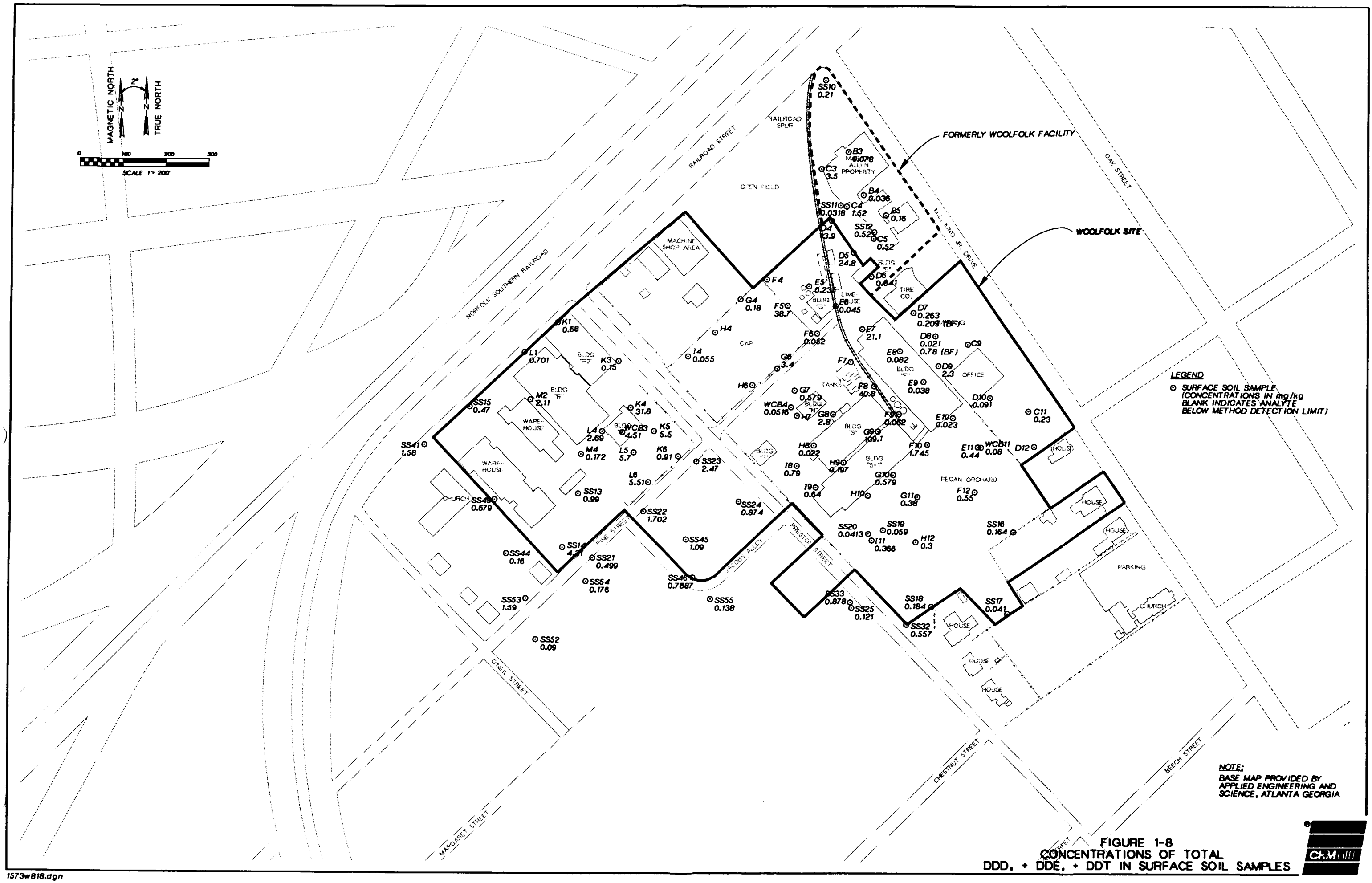


FIGURE 1-8
CONCENTRATIONS OF TOTAL DDD, + DDE, + DDT IN SURFACE SOIL SAMPLES

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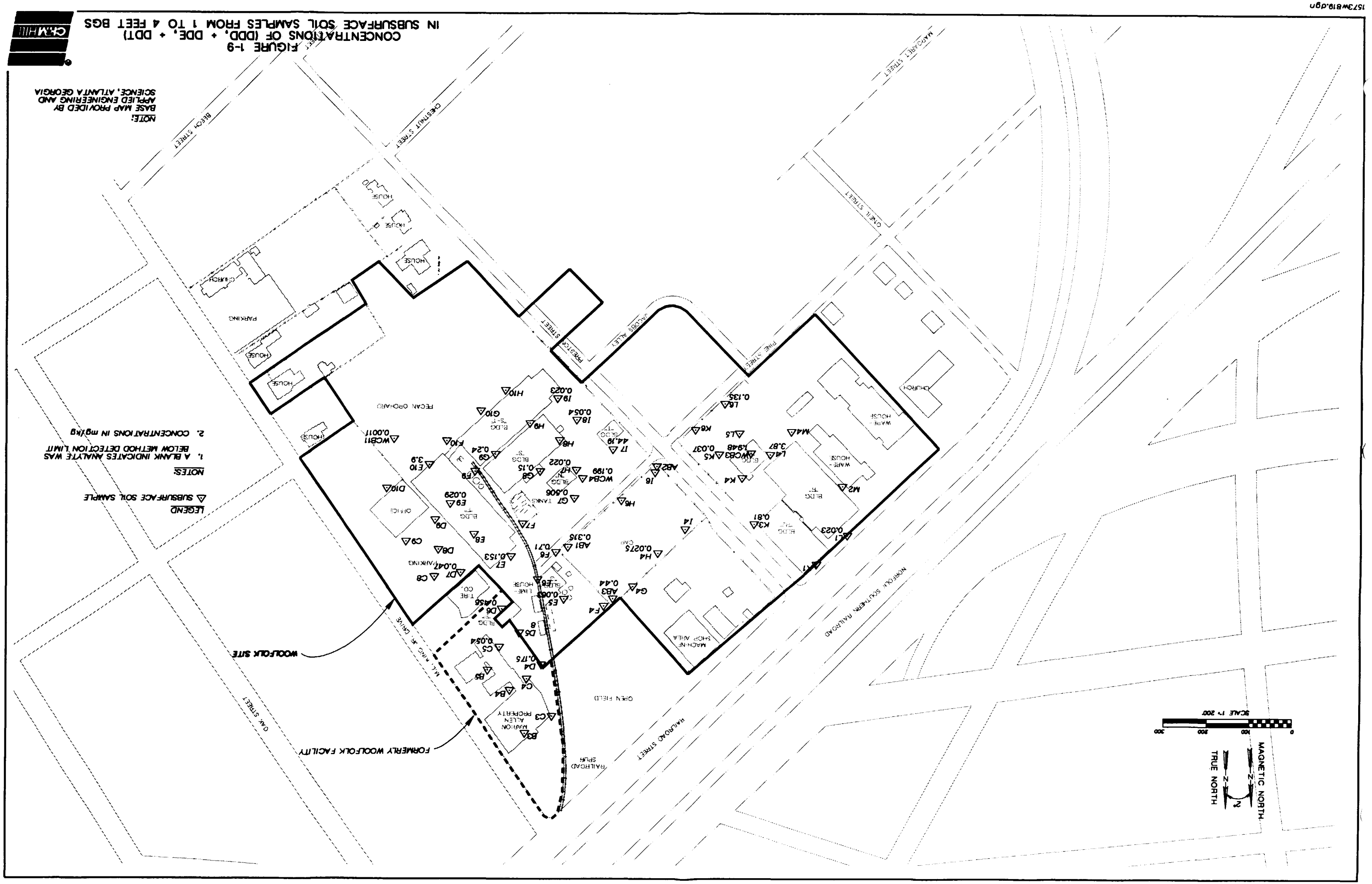


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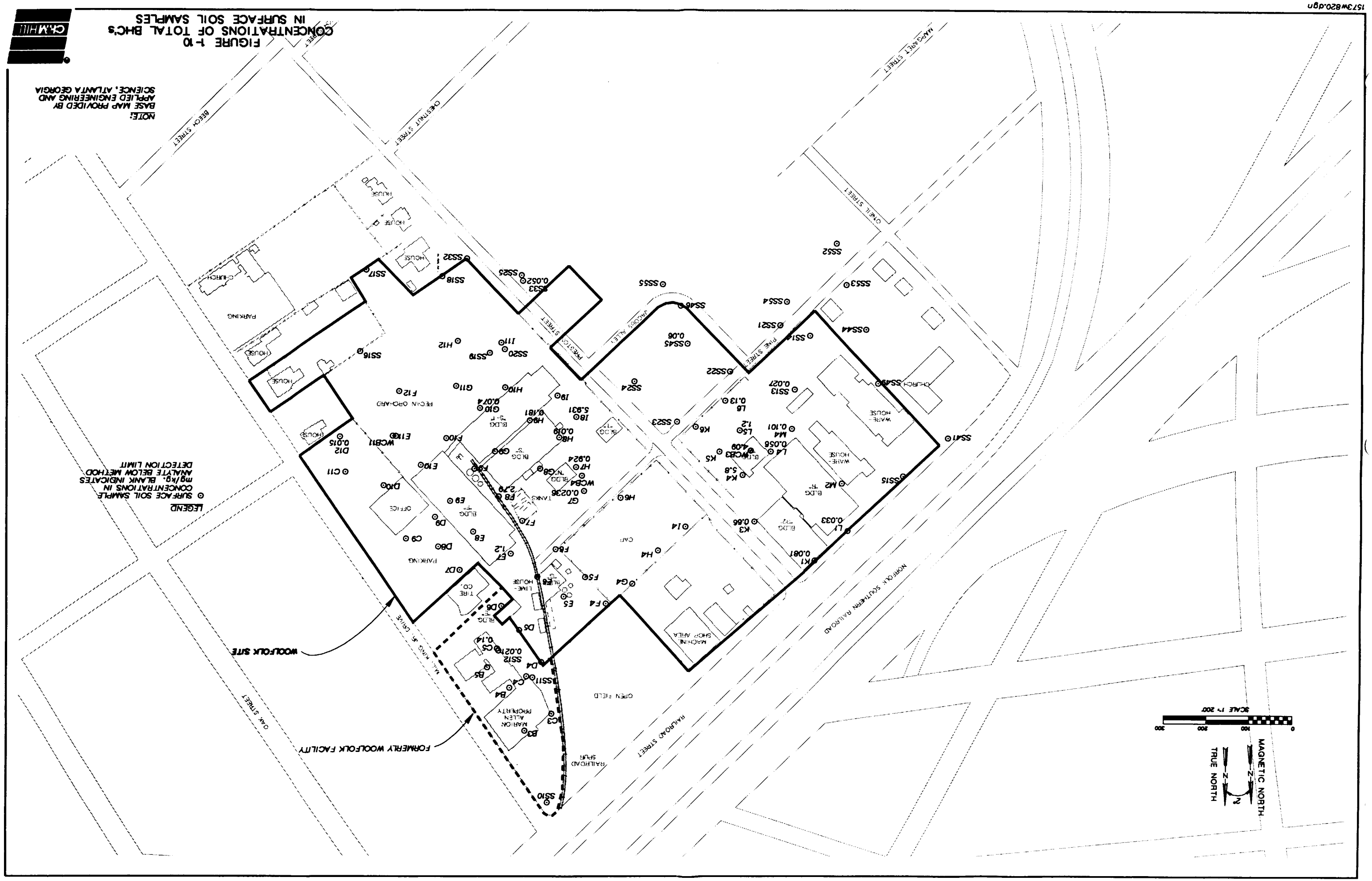
C.K.M HILL

FIGURE 1-10
CONCENTRATIONS OF TOTAL BHC'S
IN SURFACE SOIL SAMPLES

NOTE:
BASE MAP PROVIDED BY
APPLIED ENGINEERING AND
SCIENCE, ATLANTA GEORGIA

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⊙ SURFACE SOIL SAMPLE CONCENTRATIONS IN mg/kg. BLANK INDICATES ANALYTE BELOW METHOD DETECTION LIMIT

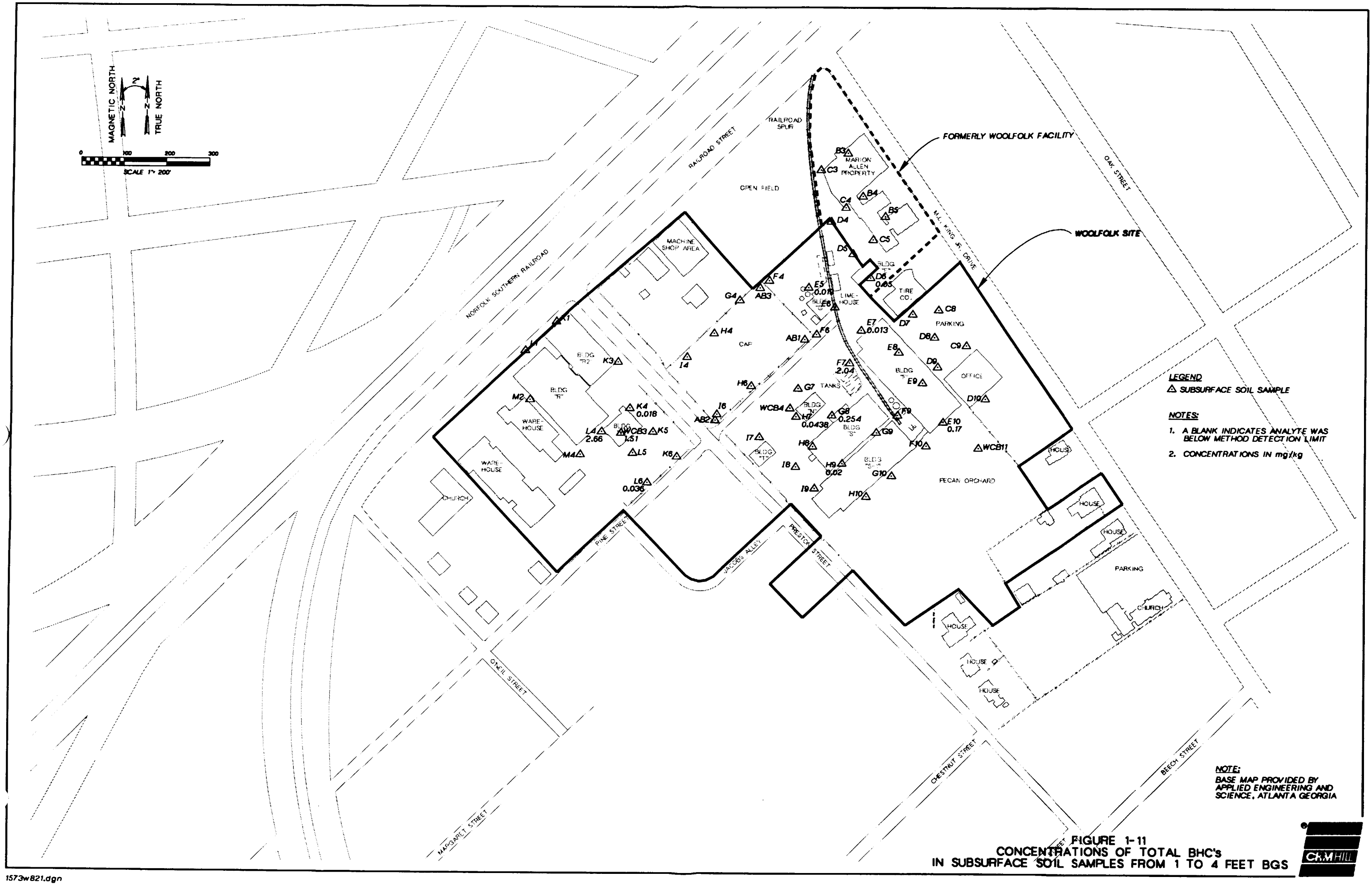


FIGURE 1-11
CONCENTRATIONS OF TOTAL BHC's
IN SUBSURFACE SOIL SAMPLES FROM 1 TO 4 FEET BGS

1573w821.dgn

# FIGURE 1-2
# CONCENTRATIONS OF ARSENIC IN SURFACE SOIL SAMPLES

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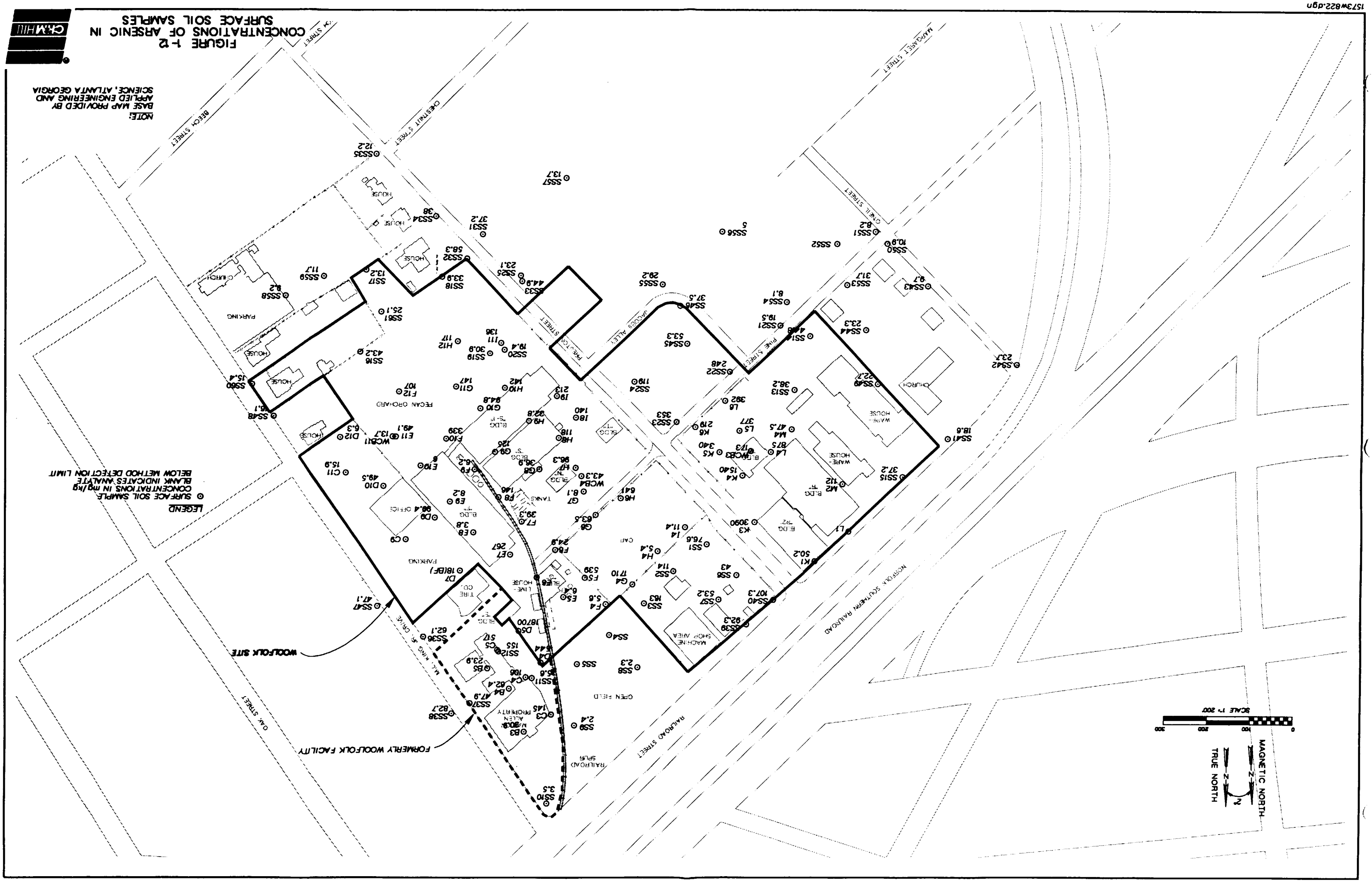


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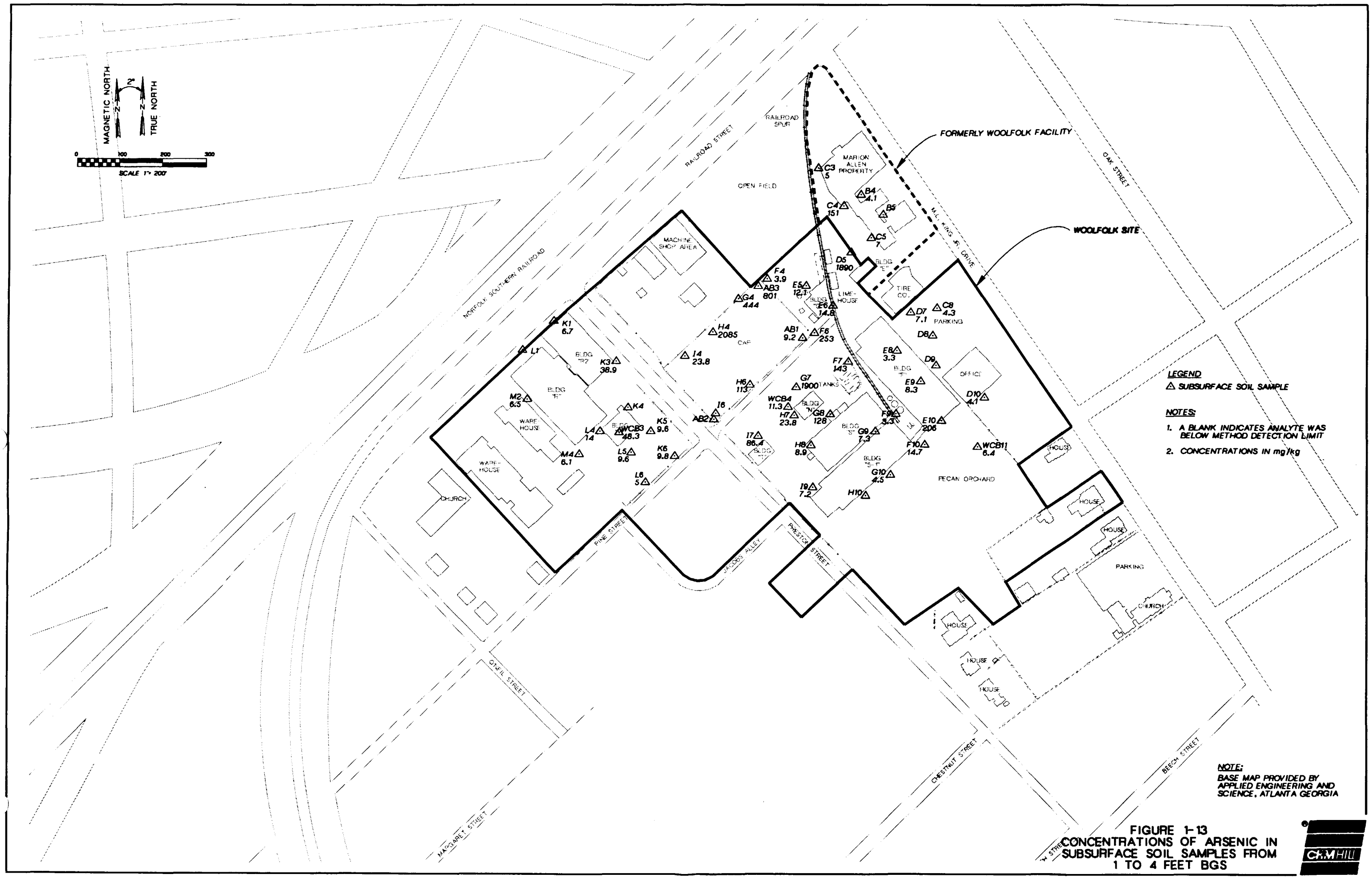


FIGURE 1-13
CONCENTRATIONS OF ARSENIC IN SUBSURFACE SOIL SAMPLES FROM 1 TO 4 FEET BGS

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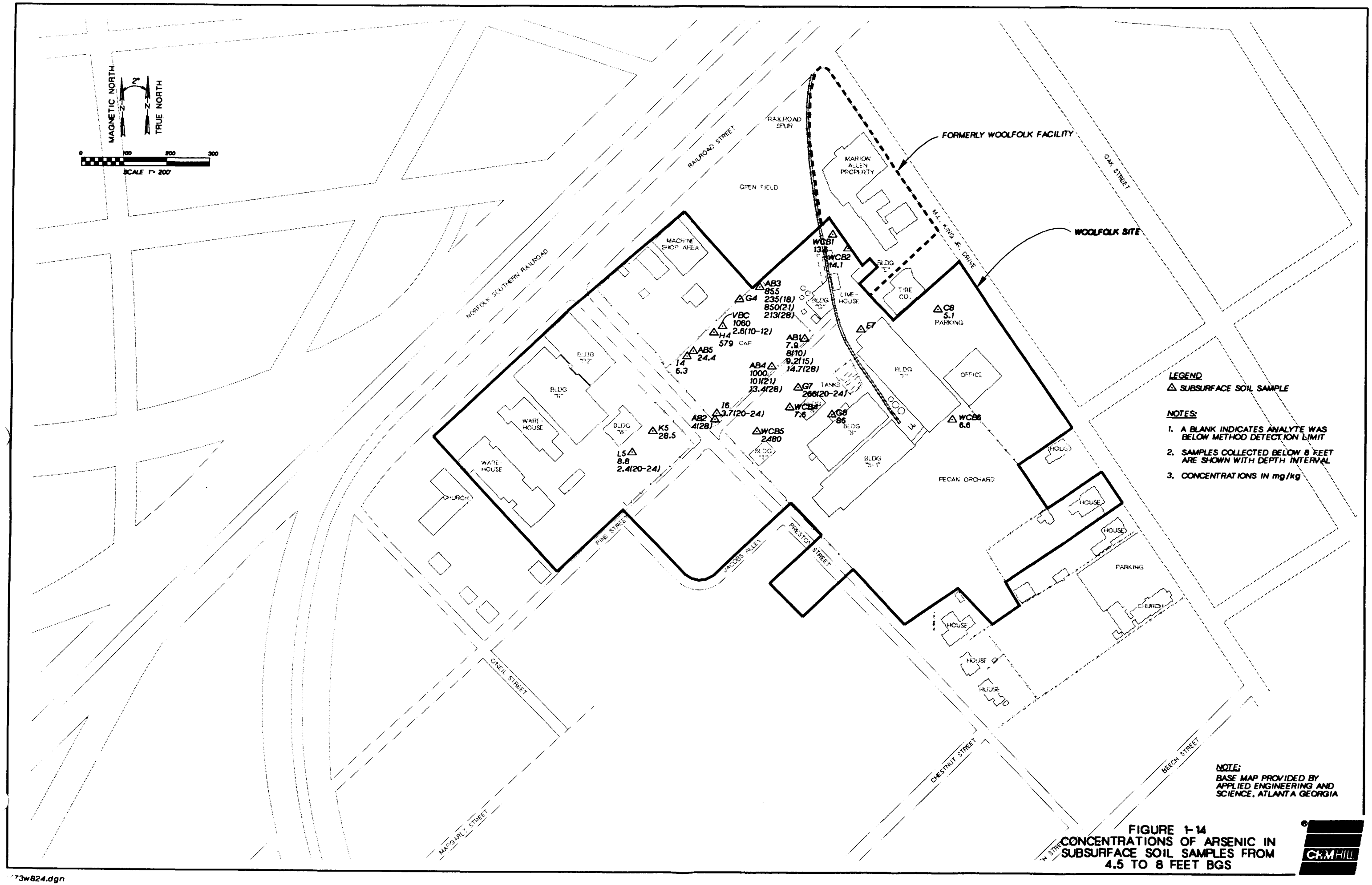


FIGURE 1-14
CONCENTRATIONS OF ARSENIC IN SUBSURFACE SOIL SAMPLES FROM 4.5 TO 8 FEET BGS

73w824.dgn

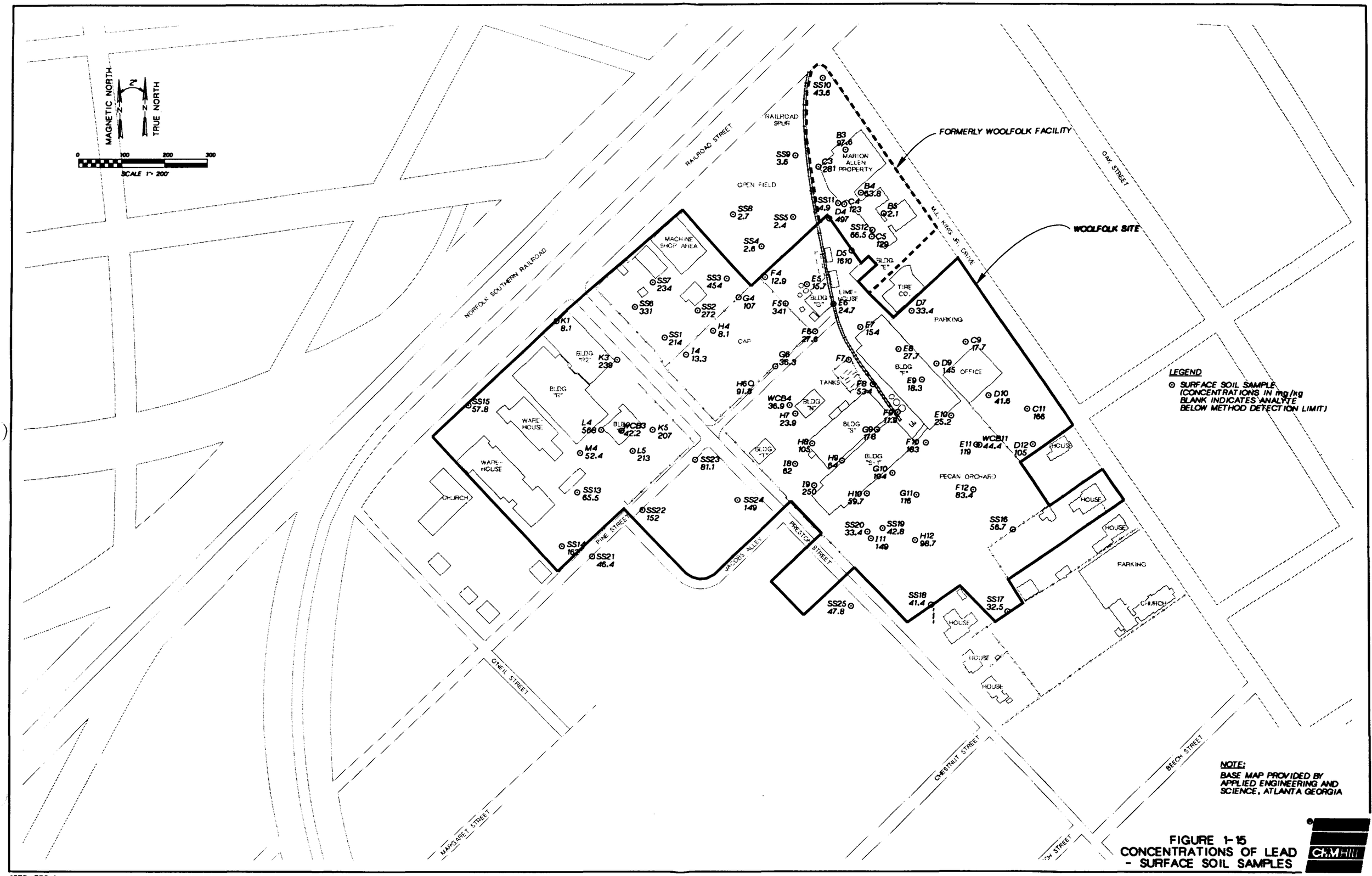


FIGURE 1-15
CONCENTRATIONS OF LEAD
- SURFACE SOIL SAMPLES

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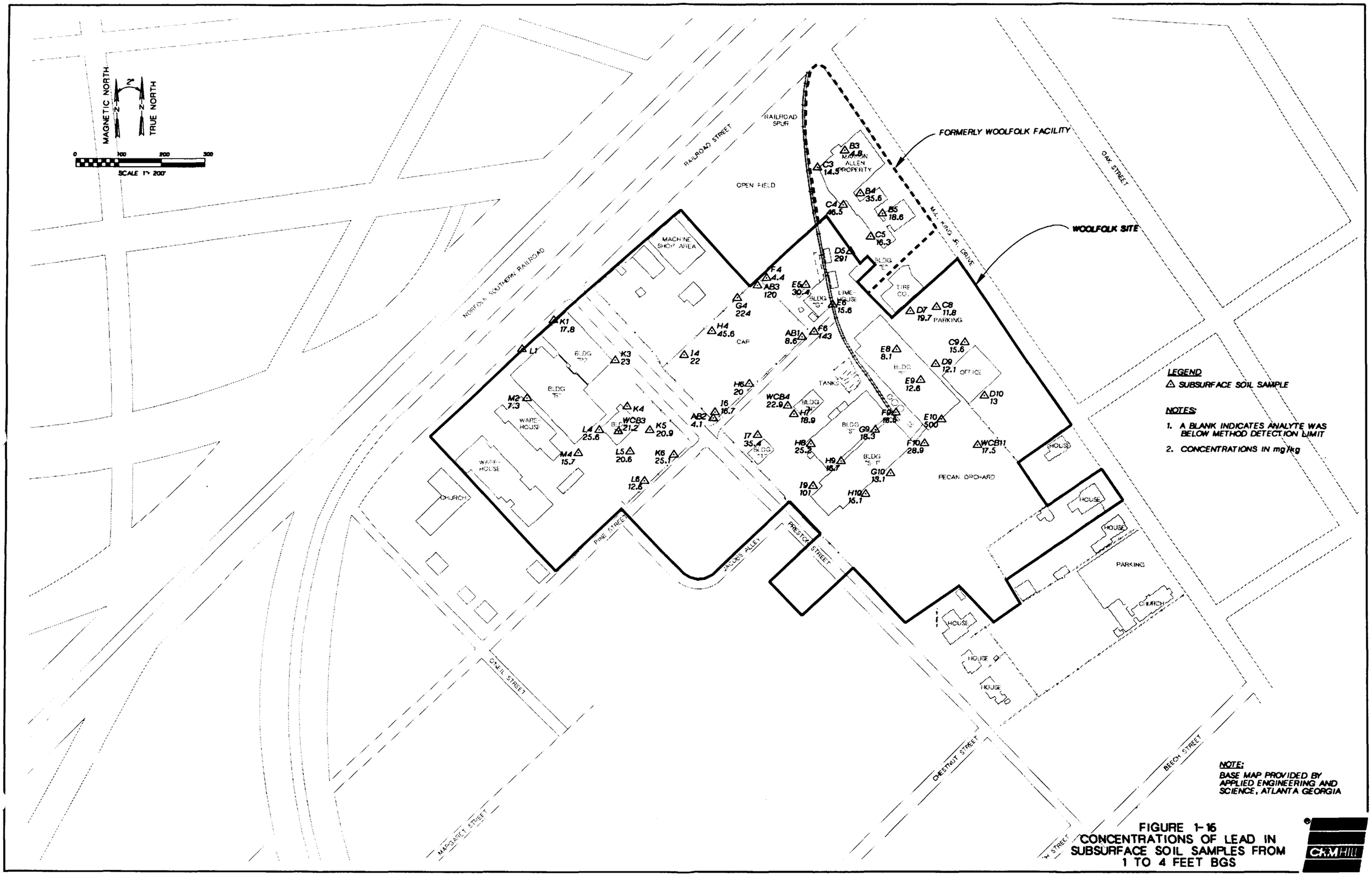


FIGURE 1-16
CONCENTRATIONS OF LEAD IN SUBSURFACE SOIL SAMPLES FROM 1 TO 4 FEET BGS

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| Table 1-2<br>WOOLFOLK RI SOIL RESULTS | | | |
|---|---|---|---|
| Contaminant | Concentrations (mg/kg) | | |
| | Maximum | Arithmetic Mean | Geometric Mean |
| **On-Site Surface Soils** | | | |
| 4,4′-DDT | 380 | 8.4 | 0.108 |
| 4,4′-DDE | 8.3 | 0.5 | 0.039 |
| 4,4′-DDD | 31 | 1.2 | 0.006 |
| Toxaphene | 300 | 11.3 | 0.351 |
| Dieldrin | 14 | 0.5 | 0.010 |
| gamma-BHC (Lindane) | 1.0 | 0.04 | 0.002 |
| Arsenic | 18,700 | 721 | 86.3 |
| Lead | 1,610 | 195 | 71.5 |
| **On-Site Subsurface Soils** | | | |
| 4,4′-DDT | 44 | 1.0 | 0.018 |
| 4,4′-DDE | 1.7 | 0.03 | 0.003 |
| 4,4′-DDD | 1.9 | 0.06 | 0.004 |
| Toxaphene | 47 | 1.5 | 0.166 |
| Dieldrin | 2.5 | 0.05 | 0.003 |
| gamma-BHC (Lindane) | 0.68 | 0.02 | 0.001 |
| Arsenic | 2,790 | 258 | 33.8 |
| Lead | 500 | 44 | 18.4 |
| **Off-Site Surface Soils (Does not include background samples.)** | | | |
| 4,4′-DDT | 1.5 | 0.4 | 0.175 |
| 4,4′-DDE | 2.4 | 0.7 | 0.422 |
| 4,4′-DDD | 0.52 | 0.1 | 0.017 |
| Toxaphene | 4.4 | 0.6 | 0.191 |
| Dieldrin | 0.15 | 0.03 | 0.009 |
| Arsenic | 353 | 51 | 28.08 |
| Lead | 454 | 135 | 57.70 |

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pertaining to the areal extent of arsenic surrounding the WCW site. The results of this investigation are shown in Figure 1-17. The following statistics pertain to arsenic concentrations of background samples.

- Maximum 77.5 ppm
- Mean 7.7 ppm
- Median 7.2 ppm

## Surface Water and Soil/Sediment Investigation

Stormwater and soil/sediment samples were collected during both phases of the RI to determine whether contamination was present in stormwater runoff from the Woolfolk Site.

The sampling results indicated that stormwater leaving the site contained only trace levels of DDT, benzoic acid, and pentachlorophenol.

At the time of the RI, the results of soil/sediment sampling indicated that pesticide concentrations, with the exception of toxaphene, are generally higher on the site than downstream (intersection of Preston and Spruce streets). Toxaphene concentrations were detected at levels up to 12 mg/kg downstream and were detected in three out of four samples throughout the stormwater conveyance system. The inorganic constituent results of the soil/sediment samples indicated that arsenic levels were generally higher on the site than upstream or downstream. Additional sediment sampling has been performed by Industrial Compliance and is described under the Removal Action section of this chapter.

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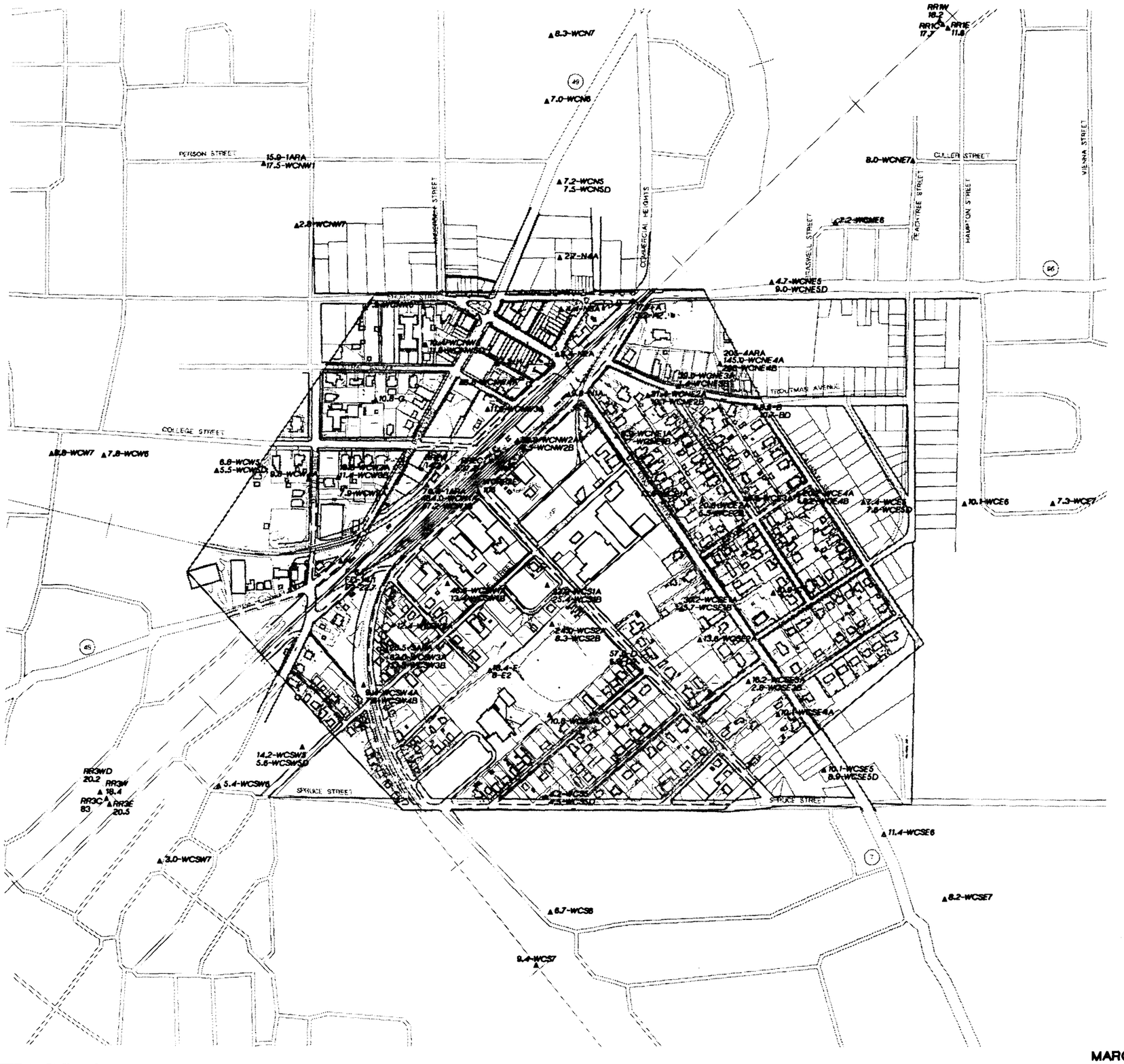


NOTES:

1. THE LOT (OR PROPERTY) LINES SHOWN ON THIS MAP WERE DIGITIZED DIRECTLY FROM PEACH COUNTY ASSESSOR'S PARCEL MAPS. THEY REFLECT ONLY AS MUCH ACCURACY AS THE ASSESSOR'S MAPPING FROM WHICH THEY WERE DIGITIZED.

**LEGEND:**

Δ 18.4-E SAMPLE RESULTS FROM SAMPLING PERFORMED IN MARCH 1993 (ARSENIC VALUE IN ppm)

• 24B SAMPLING RESULTS PERFORMED DURING REMEDIAL INVESTIGATION (ARSENIC VALUE IN ppm)

Figure 1-17
MARCH 1993 ARSENIC RESULTS

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## Groundwater Investigation

The groundwater investigation is summarized under *Operable Unit No. 1 Groundwater,* on page 1-3. A ROD was issued on the groundwater based on information presented in the December 1993 FS.

## Building E Investigation

Prior to the removal action described previously, a small garage-size building called "Building E" once stood at the site. Two or three 30- and 55-gallon drums of silvex were brought into Building E and repackaged in pint and quart containers. Some of the silvex, which contained 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) as a contaminant, was inadvertently spilled on the wood floors, resulting in localized contamination of the floors and underlying soil with silvex, TCDD, 2,4-dichlorophenoxyacetic acid and 2,4,5-trichlorophenoxyacetic acid.

Building E was demolished during the removal activities. A description of these activities is provided in the section titled "Removal Actions."

### *Wood Samples*

Sampling of the wood in Building E was conducted during the Phase I RI to assess the extent of dioxin contamination in the flooring. Five pesticides were detected in the two wood samples collected. Concentrations ranged from 9.5 mg/kg for alpha-BHC to 2,000 mg/kg for toxaphene.

Several inorganic constituents were detected in the wood samples, including arsenic (11,100 to 72,400 mg/kg) and lead (320 to 968 mg/kg). Dioxin and some of its isomers were detected in the wood samples from Building E. Concentrations ranged from 0.012 mg/kg to 37.4 mg/kg for the various isomers.

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### *Soil Samples*

Surface and subsurface soil samples were collected at three locations through an opening in the floor of Building E. At least five pesticides were detected in three of the 10 soil samples. DDT was the only pesticide found in all 10 samples, and was detected at concentrations from 0.36 to 49 mg/kg. Arsenic was detected in all samples at concentrations ranging from 63 mg/kg to 2,790 mg/kg. Lead was also identified in each of the samples from this building, at concentrations ranging from 40.1 mg/kg to 1,550 mg/kg. The data indicate that the concentrations of both arsenic and lead decrease with depth in most instances.

The 10 Building E soil samples also were analyzed for dioxin and its isomers. Nineteen dioxin isomers were detected and were distributed evenly with depth. In most cases, concentrations decreased with depth. The highest concentration of any dioxin isomer detected was total-octachlorodibenzo-p-dioxin, which was found at a concentration of 18.5 mg/kg in a shallow (0- to 1-foot depth) soil sample. This isomer is much less toxic than the more commonly known dioxin isomer TCDD.

## Air Investigation

Ambient air sampling was conducted at the Woolfolk site during May and June 1992 by Industrial Compliance, Inc. Three rounds of samples were collected from five locations in and around the Woolfolk site. All collection periods were approximately 24 hours, with the exception of the third round of sampling.

The purpose of the air sampling program was to measure air contamination levels at the site. Sampling parameters included total suspended particulate matter, metals, semivolatile organic compounds, volatile organic compounds, and pesticides.

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Air samples were analyzed for 16 pesticides. Twelve pesticides were detected at the five monitoring stations. Of the five inorganic constituents being investigated, only arsenic and lead were detected. Table 1-3 summarizes maximum contaminant concentrations.

## Contaminant Fate and Transport

The environmental media that contain chemicals of concern (COC) include surface and subsurface soil, stormwater, sediment, air, and groundwater. COCs are listed in Table 1-4. The method of selecting the COCs is defined in the Summary of Risk Assessment section in this chapter.

The contaminants of concern in soil are adsorbed to the soil particles. The degree to which a contaminant is adsorbed to soil depends on the nature of the contamination and the nature of the adsorbing material. While adsorbed to the soil and to the organic and inorganic carbon in the soil matrix, organics are subject to volatilization; biological degradation; and hydrolysis, photolysis, and other processes of chemical degradation.

The contaminants of concern also are subject to leaching as water infiltrating from the surface passes through the contaminated soil. Contaminants leached from the surface soil migrate downward, contaminating subsurface soil. Ultimately, contamination will reach groundwater. During transport to the groundwater system, organics are subject to volatilization, biological and chemical degradation, and hydrolysis. Metals are subject to precipitation under high pH conditions.

Surface soil containing contaminants can be entrained by wind into the air and can be mobilized by surface runoff into the local surface water drainage system. These environmental media are discussed below.

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| Table 1-3<br>WOOLFOLK MAXIMUM AIR CONCENTRATIONS | | |
|---|---|---|
| | Maximum Concentration (ng/m$^3$) | |
| Contaminant | J-10[a] | I-7[b] |
| Endosulfan I | 26 | |
| Endosulfan II | 16 | |
| alpha-, beta-, delta-, and gamma-BHCs | | 14 to 26 |
| alpha-Chlordane | | 35 |
| gamma-Chlordane | | 26 |
| Dieldrin | | 7.5 |
| 4,4′-DDE | | 43 |
| 4,4′-DDT | | 82 |
| Arsenic | | 41 |
| Lead | | 47 |

Notes:
[a]Sampling station J-10 is located at the south corner of Building S-1 near the fence line on Preston Street.
[b]Sampling station I-7 is located next to Building T.

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Surface runoff can move contaminated soil into local surface water drainageways such as drainage ditches. Contaminants can be transferred to the surface water, and contaminated soil can be incorporated into the sediment in the drainageway. Volatile organic compounds may volatilize into the air during surface runoff. Contaminants adsorbed to soil also can be entrained by wind into the air and distributed.

Migration of contaminants through the vadose zone to the groundwater is a function of several factors including, but not necessarily limited to:

- Infiltration rate of water through the source materials

| Table 1-4<br>CHEMICALS OF CONCERN | |
|---|---|
| **Volatile Organic Compounds** | |
| 1,2-dichloroethane | chloroform |
| 1,2-dichloropropane | xylene |
| acetone | carbon disulfide |
| chlorobenzene | tetrachloroethene |
| trichloroethylene | |
| **Semivolatile Organic Compounds** | |
| 1,4-dichlorobenzene | 2-methylnaphthalene |
| benzo(a)anthracene | benzo(a)pyrene |
| benzo(b)fluoranthene | benzo(g,h,i)perylene |
| benzo(k)fluoranthene | benzoic acid |
| bis(2-ethylhexyl)phthalate | chrysene |
| di-n-butylphthalate | di-n-octylphthalate |
| fluoranthene | indeno(1,2,3-cd)pyrene |
| naphthalene | pentachlorophenol |
| phenanthrene | pyrene |
| Dioxins (for Building E only) | |
| **Pesticides** | |
| alpha-BHC | beta-BHC |
| delta-BHC | gamma-BHC (Lindane) |
| heptachlor | endrin ketone |
| 4,4′-DDE | 4,4′-DDD |
| 4,4′-DDT | toxaphene |
| dieldrin | endosulfan I |
| endosulfan sulfate | endosulfan II |
| alpha-chlordane | gamma-chlordane |
| **Inorganic Compounds** | |
| antimony | arsenic |
| cadmium | lead |
| selenium | |

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- Distribution and continuity of lithological units in the subsurface, particularly those that retard groundwater flow, such as clay and silt layers

- Ability of soil, particularly the clays of the surficial perching unit, to adsorb contaminants

- Physical and chemical properties of the contaminants

- Dispersion of the contaminants as they are transported by water

- Possible "short-circuiting" effect of certain monitoring wells

Once in the groundwater, the contaminants are transported by moving groundwater in the aquifer. Adsorption and dispersion continue to influence the migration rates.

The fate and transport of selected contaminants in soil water and groundwater at the site was modeled to determine whether selected contaminants in the soil will adversely affect the quality of the groundwater underlying the site. The modeling was performed to estimate the concentration of selected contaminants in the soil water reaching the groundwater beneath the site.

The modeling in the vadose zone was performed using the fate and transport model MULTIMED, developed by EPA for this purpose (Salhotra et al., 1990). Mixing of contamination reaching the water table of the surficial aquifer with groundwater was estimated using the Summers model, a simple mass-balance approach.

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## Summary of Risk Assessment

The Woolfolk Site risk assessment was performed by Industrial Compliance, Inc. The remaining sections in this chapter present a summary of the results of the assessment.

## Selection of Chemicals of Concern

The 48 chemicals of toxicological or environmental concern selected for analysis in the baseline risk assessment are listed in Table 1-4. COCs were selected on the basis of the following criteria: (1) their potential to adversely affect human health; (2) their persistence or mobility in the environment; (3) their presence in groundwater at levels above federal maximum contaminant levels (MCLs); (4) their presence in environmental media exceeding background levels; (5) the number of environmental media affected; and (6) the frequency of their detection in soil, air, groundwater, surface water, or sediment.

Building E was considered separately in the risk assessment because (1) it contains chemicals such as dioxins and furans that are not found in other areas of the site, (2) the building and underlying soil contain higher levels of chemicals than other site areas, and (3) the building is locked but has limited usage as a storage facility. Dioxin contamination was not addressed for a current scenario but was addressed for the future scenarios in the baseline risk assessment. The only possible future exposure might arise from demolition of Building E and the use of its underlying soil for residential construction. Furthermore, COCs were selected specifically for Building E and Building E soil borings. All detectable dibenzodioxins and dibenzofurans, antimony, arsenic, cadmium, lead, all detectable pesticides, and all detectable semivolatiles and volatiles were selected as COCs. Aluminum, barium, calcium, chromium, copper, cyanide, iron, magnesium, mercury, manganese, nickel, potassium, sodium, vanadium, and zinc were detected at background concentrations and were not selected as COCs for Building E or Building E soil.

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## Exposure Assessment

On the basis of a review of site data and the results of the remedial investigation, pathways were identified through which human populations (residents and workers), also known as "receptor populations", may be exposed now or in the future to the COCs. These pathways were evaluated in the baseline risk assessment for potential current land use and hypothetical future land use conditions.

Potential Current Land-Use Conditions

- On-site workers: inhalation of particulate and vapor-phase chemicals in air, incidental ingestion of soil, dermal contact with soil.

- Off-site residents (adults and children): inhalation of particulate and vapor-phase chemicals in air, incidental ingestion of soil, dermal contact with soil, dermal contact with surface water, dermal and incidental ingestion exposure to sediments.

Hypothetical Future Land-Use Conditions

- Hypothetical future on-site residents (adults and children): inhalation of particulate and vapor-phase chemicals in air; incidental ingestion of soil; dermal contact with soil; dermal, inhalation, and ingestion exposure to groundwater; dermal and incidental ingestion exposure to Building E soil.

Each exposure pathway was evaluated quantitatively in the baseline risk assessment regardless of its likelihood of occurrence. The hypothetical future land-use conditions are based on the assumption that the unremediated site might one day be used for construction of a residential area. On the basis of the current site use and area zoning, this scenario is

DRAFT

highly unlikely. It was included in the risk assessment in accordance with EPA guidelines. Under current conditions, on-site residential exposure is not probable.

Scenarios were developed with EPA guidance concerning the extent, frequency, and duration of exposures for each pathway. The concentrations to which individuals might be exposed were calculated on the basis of site sampling data. These concentrations are called exposure point concentrations. The exposure scenario model used for the study is reasonable maximum exposure (RME).

RME uses conservative assumptions and is the basis for EPA remedial decisions. The RME is defined as the highest exposure that is reasonably expected to occur at the site. The assessment used the exposure parameter values recommended in several EPA guidance documents. The RME case is designed to represent an upper bound on potential exposures. Consequently, RMEs may have been overestimated but would not have been underestimated.

## Health Risk Characterization

Once the concentrations of chemicals in each environmental pathway have been estimated, the next step in the baseline risk assessment process is to compare them to relevant state or federal standards or proposed guidelines. At present, applicable or relevant and appropriate requirements (ARARs) include the EPA drinking water standards, the EPA drinking water MCLs and maximum contaminant level goals (MCLG), the EPA ambient water-quality criteria guidelines, the EPA national ambient air-quality standards (NAAQS), and state environmental standards that may supersede or supplement existing federal ARARs (EPA, 1986).

The EPA has promulgated NAAQS for seven chemicals, of which only one, lead, is a chemical of concern at the site. The maximum measured level of lead in air at the site (0.000069 $mg/m^3$) was considerably below the NAAQS of 0.0015 $mg/m^3$.

DRAFT

There are no ARARs for the chemicals of concern in soil or sediment. Therefore, no comparison of chemicals of concern in soil with ARARs could be made.

## Risk Characterization

Exposure estimates were combined with health criteria for the chemicals of concern to estimate potential cancer and noncancer human health risks of exposure to materials in environmental media at the Woolfolk site. These risks were estimated for an RME case. The RME case combines RME estimates with upper bound slope factors and conservative RfDs with safety factors. The RME scenario is intended to provide an upper bound estimate of the potential human health risks and may overestimate actual human health risks.

### *Cancer Risk Estimates*

To assess potential lifetime cancer risks posed by the identified pathways, the RME case chronic daily intakes are multiplied by the slope factor for the chemicals. The resulting numerical cancer risk indicates the number of cases of cancer that would be expected in an exposed population above those expected in that population if the exposure had not occurred. Thus, the cancer risks calculated in a risk assessment should be interpreted in light of the recognized incidence of cancer in the U.S. population of approximately 25 to 30 percent. The risk values calculated in this manner are expressed in scientific notation ($1.0E^{-04}$ to $1.0E^{-06}$) and represent the number of additional cases of cancer in a given number of exposed individuals. For example, a risk of $1.0E^{-04}$ refers to one additional case of cancer over a lifetime in 10,000 exposed persons. A risk of $1.0E^{-05}$ refers to one additional case of cancer over a lifetime in 100,000 exposed persons, and so on.

EPA has traditionally targeted the range between $1.0E^{-04}$ and $1.0E^{-06}$ (1 in 10,000 to 1 in 1,000,000) when establishing regulations for potential carcinogens in drinking water and

DRAFT

air. Risks calculated from exposure to the chemicals of concern at the site will be compared with this range.

To illustrate this risk calculation, if a population of 10,000 people were exposed for a lifetime to chemicals resulting in a risk at the upper end of the EPA range ($1.0E^{-04}$), one additional case of cancer would be predicted to occur in that population over a lifetime. Thus, the total number of cases of cancer in that population would be 2,500 (background incidence without exposure to the chemical of concern) plus one (additional cancer from exposure to the chemical of concern), or 2,501.

As discussed below, the methods used in calculating cancer risks result in upper-bound estimates of risk, and actual risks are unlikely to exceed those calculated. Actual risks may even be nonexistent. In referring to the interpretation of risk estimates, the EPA has noted: "Such an estimate, however, does not necessarily give a realistic prediction of the risk. The true value of risk is unknown, and may be as low as zero."

### *Risk Estimates for Effects Other Than Cancer*

The overall potential for a specific chemical to cause noncarcinogenic effects such as kidney or liver disease is assessed using the hazard quotient (HQ). The HQ is calculated by dividing a person's chronic or subchronic daily intake of a chemical by the RfD of that chemical. The RfD for a given chemical is determined by EPA and represents the dose over a lifetime that is unlikely, even for sensitive populations, to cause adverse health effects. Hazard indices for children exposed to the chemicals of concern for less than 7 years were calculated, as required by EPA, using the chronic reference dose.

For the noncancer risks resulting from exposure to several chemicals at once, individual HQs are added. The resulting number is the hazard index (HI). If the HI is less than one, the chemicals are unlikely to represent a risk to human health. If the hazard index is greater than one, the chemicals are segregated according to which organ they affect (e.g.,

DRAFT

kidney, liver, skin). Separate HIs are calculated for each toxicological effect. If the HI is still greater than one, then the potential estimated lifetime exposure exceeds the level anticipated to be without adverse effects.

Application of the HIs presented below beyond the scope of this risk assessment should be avoided. An HI of one or less simply means that noncancer effects are unlikely. However, an HI above one does not mean that noncancer effects have occurred or will ever occur. An HI or HQ greater than one simply means that exposures are greater than those that are anticipated to be without adverse effects. As noted by EPA, "If the exposure level exceeds this threshold (HQ or HI above 1), there may be concern for potential noncancer effects. As a rule, the greater the value of (the HQ or HI) above unity (1), the greater the level of concern."

## Risk Characterization for Current Site Workers

The lifetime cancer risks associated with on-site worker exposures are summarized in Table 1-5 below. This exposure scenario assumes an exposure duration and frequency of 10 years at 250 days per year, and 25 years at 250 days per year.

**Table 1-5**
**SUMMARY OF RISK CHARACTERIZATION FOR CURRENT SITE WORKERS**

| Receptor | RME Hazard Index | RME Additional Lifetime Cancer Risk† |
|---|---|---|
| On-Site Worker | 1.9 | $3E^{-04}$ |

†Current lifetime cancer risk without exposure to site chemicals is approximately one in four, or 0.25. Risk with RME is 0.2503 or less.
EPA's remedial decisions are based on the RME exposure scenario.

The additional lifetime cancer risk to the on-site worker under RME is above the EPA target range. Exposure to arsenic from ingestion of site soil accounts for over 80 percent of the additional lifetime cancer risk. The calculated cancer risk from site RME is

approximately 10 times lower than the risk from occupational arsenic exposure allowed by the U.S. Occupational Safety and Health Administration (OSHA). The hazard index for the RME is slightly above 1.

## Risk Characterization for Current Off-Site Residents

The risk to off-site residents has been reduced considerably due to the completed removal activities. These activities were described earlier in this chapter.

## Summary of Risks Under a Future Residential Land-Use Scenario

Exposures and risks of hypothetical future use of the Woolfolk site as residential land also were calculated. This scenario estimated the potential chronic human health risks of exposure to chemicals in the soil, air, and groundwater that might occur if residences were built on the site. Since institutional controls and groundwater treatment is required as part of the OU1 remedy, the scenario is extremely unlikely. The scenario assumed an exposure duration of 9 years and 30 years for adults and 6 years for children, and an exposure frequency of 350 days per year. These risks are summarized in tables 1-6 and 1-7.

DRAFT

**Table 1-6**
**SUMMARY OF RISK CHARACTERIZATION FOR THE FUTURE RESIDENTIAL LAND-USE SCENARIO—SURFACE SOIL**

| Exposure Source | Receptor | RME Hazard Index | RME Additional Lifetime Cancer Risk† |
|---|---|---|---|
| Surface Soil | Adult | 9.9 | 2E-03 |
| | Child | 83.2 | 4E-03 |
| Building E Soil | Adult | 10.0 | 7E-03 |
| | Child | 90.2 | 5E-03 |

†Current lifetime cancer risk without exposure to site chemicals is approximately one in four, or 0.25. Risk with child RME to chemicals in Building E soil is 0.254 or less.
EPA's remedial decisions are based on the RME exposure scenario.

The additional lifetime cancer risks of exposure to surface soil and Building E soil in a residential area built within the site boundaries exceed the EPA target risk range for RME conditions. Arsenic accounted for more than 90 percent of the lifetime cancer risk for exposure to surface soil. Arsenic, polychlorinated dibenzodioxins, and polychlorinated dibenzofurans accounted for almost all of the lifetime cancer risk associated with exposure to Building E soil. In addition, hazard indices are greater than one. It must be emphasized that these risk estimates are hypothetical.

**Table 1-7**
**SUMMARY OF RISK CHARACTERIZATION FOR THE FUTURE RESIDENTIAL LAND-USE SCENARIO—GROUNDWATER**

| Exposure Source | Receptor | RME Hazard Index | RME Additional Lifetime Cancer Risk† |
|---|---|---|---|
| Upper Cretaceous Water Table Aquifer | Adult | 83.2 | 2E-02 |
| | Child | 201 | 8E-03 |
| Upper Cretaceous Confined Aquifer | Adult | 1 | 2E-04 |
| | Child | 1.97 | 8E-05 |
| Tuscaloosa | Adult and child | None | None |

†Current lifetime cancer risk without exposure to site chemicals is approximately one in four, or 0.25. Risk with adult RME to chemicals in the Upper Cretaceous water table aquifer is 0.27 or less.
EPA's remedial decisions are based on the RME exposure scenario.

DRAFT

Based on the results of the RI, contaminants potentially migrate vertically downward through the kaolin clay of the surficial perching unit and contaminate the groundwater of the Upper Cretaceous water table aquifer. Therefore, the surficial aquifer appears to be a source of contaminants to the underlying water-bearing units. EPA has classified the surficial aquifer as containing Class IIb groundwater (potential source of drinking water). The risks from this aquifer have been qualitatively evaluated. The risks would be greater than the risks associated with the Upper Cretaceous water table aquifer because the concentrations of the COCs are higher.

Additional lifetime cancer risks associated with ingestion of water from the Upper Cretaceous water table aquifer exceed the EPA target risk range for reasonable maximum exposures. Hazard indices for RME chemical exposures from this source were greater than one. Arsenic accounted for more than 95 percent of the calculated lifetime cancer risk and hazard indices.

Additional lifetime cancer risks from ingestion of water from the Upper Cretaceous confined aquifer are within the EPA target risk range for reasonable maximum exposures for the adult. Child RME lifetime cancer risk for this aquifer is slightly above the EPA target risk range. The hazard index for the RME adult slightly exceeds one.

Because none of the chemicals of concern were detected in the Tuscaloosa aquifer above drinking water standards, no risk estimates were calculated.

## Risk Assessment Conclusions

On the basis of the results of this baseline risk assessment, the following conclusions can be made:

- Chemicals have migrated from the source areas and have affected (1) the shallow surficial water table aquifer, (2) the Upper Cretaceous water table aquifer, and (3) the Upper Cretaceous confined aquifer. The concentration of many of the chemicals of concern exceeds drinking water standards. This has been addressed in "OU1-Groundwater" on page 1-3.

- Chemicals from the site have not affected the City of Fort Valley's drinking water supply. This has been addressed in "OU1-Groundwater" on page 1-3.

DRAFT

- None of the chemicals detected in the Tuscaloosa aquifer were above their limits in drinking water standards. This has been addressed in "OU1-Groundwater" on page 1-3.

- Chemicals have migrated from the source area to the surface water drainage system. Exposure to drainage system sediments, but not surface water, presents additional lifetime cancer risks above the EPA target risk range for Superfund sites. The total noncancer hazard index for the child resident exposed to drainage system sediments was greater than one under the RME case. This has been addressed in "Removal Actions."

- Under potential current land use conditions, contact with soil by on-site workers under RME conditions poses an additional lifetime cancer risk that is slightly above the EPA target risk range for Superfund sites. The noncancer hazard index is slightly above one for the RME case. Cancer risks are due primarily to ingestion exposure of arsenic in soil.

- Under hypothetical future land use conditions, exposure to chemicals in soil by on-site residents poses additional lifetime cancer risks above the EPA target risk range for Superfund sites. Noncancer hazard indices for exposure to surface soil were greater than one.

- Similarly, under hypothetical future land use conditions, exposure to chemicals in Building E soil by on-site residents poses additional lifetime cancer risks above the EPA target risk range for Superfund sites. Noncancer hazard indices for exposure to Building E soil were greater than one.

- Under hypothetical future land use conditions, additional lifetime cancer risks from ingestion of water from the Upper Cretaceous water table aquifer exceed the EPA target risk range for reasonable maximum exposures.

DRAFT

Hazard indices for reasonable maximum chemical exposures from this source were greater than one. Arsenic accounts for over 95 percent of the calculated total lifetime cancer risk and hazard indices. This has been addressed in "OU1—Groundwater" on page 1-3.

- Under hypothetical future land use conditions, additional lifetime cancer risks from ingestion of water from the Upper Cretaceous confined aquifer exceeded the EPA target risk range. The RME case for the child exposed to the Upper Cretaceous confined aquifer exceeded one. This has been addressed in "OU1—Groundwater" on page 1-3.

- Under hypothetical future land use conditions, additional lifetime cancer risks from ingestion of water from the surficial aquifer will exceed those estimated for the Upper Cretaceous aquifers. This has been addressed in "OU1—Groundwater" on page 1-3.

## Ecological Risk Assessment

An ecological assessment evaluates potential ecological effects at Superfund sites. It is a qualitative and quantitative appraisal of the actual and potential effects on the environment of a Superfund site. Not all sites require ecological risk assessments. Many sites in industrial areas have little or no wildlife. For sites with no ecological risk, the appropriate level of effort for assessing ecological risks is determined on a site-by-site basis (EPA, 1988 and 1989). Because the Woolfolk site is located adjacent to the central business district of Fort Valley, Georgia, and the surrounding community consists of residential homes and small businesses, this ecological risk assessment was limited to a qualitative assessment of the site with respect to:

- Wetlands and water resources
- Floodplains

DRAFT

- Endangered and threatened species and their critical habitats
- Cultural resources
- Wild and scenic rivers
- Wilderness areas
- Significant agricultural lands
- Coastal zones
- Coastal barriers

## Ecological Risk Assessment Conclusions

A qualitative assessment of the potential ecological effects of the Woolfolk site concluded that:

- The Woolfolk site likely does not affect any designated wetlands because the closest wetland is more than three miles from the site and is not hydrologically connected.

- The Woolfolk site is not located within either the 100-year or 500-year floodplain.

- The Woolfolk site likely does not affect any of the three identified endangered species (the red-cockaded woodpecker (*Piocoides borealis*), Kirtland's warbler (*Dendroica kirtlandii*), and the bald eagle (*Haliaeetus leucocephalus*)) for two reasons: (1) there are no records or reported sightings of any of these species in Peach County; and (2) the site and surrounding area do not provide the critical habitat needed for these endangered species.

- Two historical sites are listed in Peach County, Georgia. These are the Peach County Courthouse located on West Church Street, Fort Valley,

DRAFT

Georgia, and Strother's Farm located on Highway 49 near the Macon County/Peach County line. The Woolfolk site likely does not adversely affect the use of these sites or their cultural value because they are located at least half a mile from the site.

- There are no wild and scenic rivers in Peach County. The closest wild and scenic river is the Chattooga River, located approximately 150 miles from the Woolfolk site.

- No designated wilderness areas exist near the site or in Peach County, Georgia.

- The soil on and near the site and in the entire City of Fort Valley are designated as Type 1 prime farmland. Approximately one mile from the site is farmland designated as Type 3, additional land of statewide importance. Although the soil on and near the site are designated as prime farmland, the zoning of the site as commercial/residential property indicates its use as farmland would be unlikely.

- The site does not affect any coastal zones or coastal barriers because it is located more than 150 miles from the coast.

DRAFT

WDCR859/001.WP5

## Chapter 2

# Remedial Action Objectives and Identification and Screening of Technologies

## Introduction

This chapter presents general and site-specific remedial action objectives for the Woolfolk site and the identification and screening of remedial technologies and process options. The Woolfolk site consists of contaminated areas on the site. General remedial action objectives are defined by the NCP and Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (as amended by the Superfund Amendments and Reauthorization Act (SARA)) and are applicable to all Superfund sites. CERCLA objectives relate to statutory requirements for development of the remedy. Site-specific objectives relate to specific contaminated media (such as soil and groundwater) and to potential exposure routes, and identify target remediation levels. Site-specific objectives, which require an understanding of the contaminants and their physical properties in their respective media, are based on an evaluation of the risks to public health and the environment and on applicable or relevant and appropriate requirements (ARARs).

DRAFT

## NCP and CERCLA Objectives

The NCP requires the following objectives for the selected remedy:

- Each remedial action selected shall be protective of human health and the environment [40 *CFR* 300.430 (f)(ii)(A)].

- On-site remedial actions selected must attain those ARARs that are identified at the time of the Record of Decision (ROD) signature [40 *CFR* 300.430(f)(ii)(B)].

- Each remedial action selected shall be cost-effective. A remedy shall be cost-effective if its costs are proportional to its overall effectiveness [40 *CFR* 300.430 (f)(ii)(D)].

- Each remedial action shall utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable [40 *CFR* 300.430 (f)(ii)(E)].

The statutory scope of CERCLA was amended by SARA to include the following general objectives for remedial action at all CERCLA sites:

- Remedial actions "shall attain a degree of cleanup of hazardous substances, pollutants, and contaminants released into the environment and of control of further releases at a minimum which assures protection of human health and the environment" (Section 121(d)).

- Remedial actions preferred for selection are those "in which treatment that permanently and significantly reduces the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants is a principal element" (Section 121(b)). An explanation must be published if a permanent solution using treatment or recovery technologies is not selected.

- The least favored remedial actions are those that include "offsite transport and disposal of hazardous substances or contaminated materials without treatment where practicable treatment technologies are available" (Section 121(b)).

DRAFT

- The selected remedy must comply with or attain the level of any "standard, requirement, criteria, or limitation under any Federal environmental law...or any promulgated standard, requirement, criteria, or limitation under a State environmental or site siting law that is more stringent than any Federal standard, requirement, criteria, or limitation" (Section 121(d)(2)(A)).

## Development of Site-Specific Remedial Action Objectives

Site-specific remedial action objectives are based on the exposure setting for which protection would be provided, for example, protection from ingestion of or direct contact with contaminated soil. For this FS addendum, the potential exposure routes and risks were identified in the risk assessment part of the RI and are summarized in Chapter 1.

Preliminary target cleanup levels are specified in this FS addendum. However, final cleanup levels are determined by EPA in the ROD, following analysis of the remedial alternatives in this FS addendum and public comment on EPA's recommended remedial action.

## Identification of Environmental Media and Operable Unit Groups

The risk assessment identified on-site and stormwater-sewer sediments as contaminated media. Remediation alternatives were developed for those media, the existing cap and for potential contaminant releases from on-site structures. In an FS, environmental media are addressed individually to simplify the identification and screening of technologies and the development of alternatives. Remedial action objectives are established for each environmental media.

DRAFT

## Site-Specific Remedial Action Objectives

Remedial action objectives for protection of public health and the environment consider both the level of contamination and the potential exposure route. They also consider the future protection of environmental resources and how to minimize long-term disruption to existing site operations. Table 2-1 and Table 2-2 present site-specific remedial action objectives and selected soil and sediment proposed target action levels, respectively. The risk assessment concluded that arsenic accounted for over 90 percent of the excess cancer risk at the Woolfolk site and therefore is the primary soil contaminant of concern at the site. The rationale for the proposed target action levels is discussed in Appendix A. Appendix A also presents the proposed target action levels for all the contaminants of concern identified in the risk assessment.

In addition to the proposed target action levels presented in Table 2-2, groundwater protection levels were estimated using the MULTIMED fate and transport model. This modeling was performed to estimate the concentration of contaminant that could remain in the soil without exceeding drinking water standards in the surficial aquifer. Five contaminants of concern were modeled: arsenic, lead, lindane, toxaphene, and 1,2-DCA. The proposed groundwater protection levels for the Woolfolk site soil are presented in Table 2-3. A description of the calculations used to derive these protection levels is presented in Appendix B.

In addition, remedial actions must meet standards as defined by the ARARs of EPA and the Georgia EPD. If the ARARs do not address a particular situation, remedial actions must take into account the "to be considered" criteria or guidelines described below.

## Applicable or Relevant and Appropriate Requirements

"Applicable requirements" are standards and other environmental protection requirements of federal or state law dealing with a hazardous substance, pollutant, or contaminant and its

DRAFT

| Table 2-1<br>SITE-SPECIFIC REMEDIAL ACTION OBJECTIVES | |
|---|---|
| On-Site Soil | Limit exposure of workers to on-site soil that contains contaminant concentrations above the proposed target action levels specified in Table 2-2. |
| | Limit off-site migration by stormwater and wind erosion of contaminated on-site soil above proposed target action levels. |
| | Limit leaching of contaminants in on-site soil with contaminant concentrations greater than proposed levels presented in Table 2-3. |
| Off-Site Soil | Limit exposure to off-site soil in residential settings with contaminant concentrations above the proposed target action levels specified in Table 2-2. |
| | Limit exposure to off-site soil in nonresidential settings with contaminant concentrations greater than the proposed target action levels specified in Table 2-2. |
| Structures | Prevent the recontamination of on-site soil from continued operations in buildings that cannot be rehabilitated (Building W). |
| | Prevent direct contact with both building and soil contamination at dioxin concentrations exceeding proposed levels specified in Table 2-2 (Building E). |
| Stormwater/Sediment | Limit direct contact and further migration of sediment containing contaminant concentrations above proposed levels specified in Table 2-2. |

DRAFT

**Table 2-2**
**SOIL AND SEDIMENT**
**PROPOSED TARGET ACTION LEVELS**

| Contaminant | Concentrations (mg/kg) |
|---|---|
| On-Site Soil[1] | |
| Arsenic | 300+ and 100 |
| Lead | 500 |
| Toxaphene | 55* |
| Dieldrin | 4* |
| 4,4-DDT | 200* |
| 2,3,7,8-TCDD equivalent (Building E Soil) | 0.0005** |
| Lindane | 63* |
| Off-Site Soil—Residential | |
| Arsenic | 30++ |
| Lead | 500 |
| Toxaphene | 7++ |
| Lindane | 7* |
| 4,4-DDT | 24++ |
| 4,4-DDE | 24++ |
| Dieldrin | 0.5++ |
| Pentachlorophenol | 70++ |
| Off-Site Soil—Commercial or Redevelopment Area | |
| Arsenic | 100 |
| Lead | 500 |
| Lindane | 63* |
| Sediment[2] | |
| Arsenic | 100 |
| Lead | 500 |
| Toxaphene | 130* |
| Lindane | 110* |

Notes:
*Concentration is based on the risk evaluation (see Appendix A) because the groundwater protection level is higher (see Appendix B and Table 2-3).
**Value is based on 2,3,7,8-TCDD equivalent (see Appendix A).
[1]The on-site soil proposed target action levels, unless otherwise noted, are based on the $1 \times 10^{-5}$ cancer risk for an adult worker under the RME exposure scenario (see Appendix A).
[2]Sediment proposed target action levels are based on the $1 \times 10^{-5}$ cancer risk for a child resident under the RME exposure scenario (see Appendix A).
+For paved areas based on cleanup level developed by EPA for off-site soil removal activities on paved industrial/commercial areas.
++Residential level established for EPA for off-site soil removal activities (surface soil).

All levels presented in this table are preliminary and have not been approved by EPA.

DRAFT

| Table 2-3<br>GROUNDWATER PROTECTION LEVELS—<br>SOIL CONCENTRATIONS | |
|---|---|
| **Contaminant** | **Concentration (mg/kg)** |
| Arsenic | 454 |
| Lead | 623 |
| Lindane | Well above soil ingestion level of 7 |
| Toxaphene | 6,110 |
| 1,2-Dichloroethane | 17 |

WDCR859/013.WP5/2

DRAFT

remedial action. For example, RCRA regulations are "applicable" to wastes disposed of off-site.

"Relevant and appropriate requirements" are standards and other environmental protection criteria of federal or state law that, although not "applicable" to a hazardous substance or remedial action, address situations sufficiently similar to those at the CERCLA site that their use is suitable. For example, although RCRA regulations are not applicable to closing a site with hazardous waste that was disposed of before 1980 still in place, the regulations may be relevant and appropriate.

A requirement may be "relevant" to a particular situation but not "appropriate" because of differences in the duration of the regulated activity or the physical characteristics of the affected media. For example, parts of the requirements for design and operation of a waste pile found in 40 CFR 264.251, such as the requirement to use a liner of sufficient strength and thickness to prevent failure due to pressure gradients, might be considered relevant and appropriate, while that portion of the design requirements calling for installation of a liner covering all surrounding earth likely to be in contact with the waste might not be appropriate if such earth is already contaminated and the eventual remedy is to remove all of that earth.

A requirement that is relevant and appropriate must be complied with as if it were applicable. Relevant and appropriate requirements that are more stringent than applicable requirements take precedence. However, more discretion is used in determining relevant and appropriate requirements than in determining applicable requirements.

Another factor in determining which response or remedial requirements must be met is whether the requirement is substantive or administrative. Onsite CERCLA response actions must meet "substantive requirements" but not administrative requirements. Substantive requirements are those dealing directly with actions or with conditions in the environment. Administrative requirements implement the substantive requirements by prescribing procedures such as fees, permitting, and inspection, which make substantive

DRAFT

requirements effective. This distinction applies to onsite actions only; offsite response actions are subject to all applicable standards and regulations, including administrative requirements such as permits.

## Other Criteria or Guidelines To Be Considered

Many federal and state programs have criteria, advisories, guidelines, and proposed standards that provide recommended procedures if there are no ARARs or if existing ARARs are not adequate. In such situations, these "to be considered" criteria or guidelines should be used to set remedial action levels. Examples of criteria to be considered are RFDs and potency factors for ingestion of noncarcinogenic and carcinogenic compounds used in the risk assessment.

An action-specific requirement that is a "to be considered" criterion is the Georgia EPD's requirements for siting of Subtitle D landfills. Subtitle D landfills are landfills permitted to accept solid waste but not hazardous waste. One requirement is buffer zones intended to minimize the effects of methane gas generation, fugitive dust, and other nuisances. The applicability of these requirements to the remedial actions that may occur at the Woolfolk site are questionable.

DRAFT

## Determination of ARARs

There are three classifications of ARARs: chemical-specific, location-specific, and action-specific. Potential ARARs for the Woolfolk site are summarized in Appendix C. Summary tables organize the potential ARARs into the three classifications. "To be considered" criteria are included with the ARARs for each classification. Federal and state ARARs are combined in the tables.

The remedial action alternatives developed in the FS were analyzed for compliance with the potential federal and state ARARs. This process involved identifying potential

requirements for each of the alternatives, evaluating their applicability or relevance, and determining whether the remedial alternatives can achieve the ARARs. Results of that analysis are found in Chapter 4 of this report.

### *Chemical-Specific Requirements*

Chemical-specific requirements set health-based concentration limits or discharge limits in various environmental media for specific hazardous substances, pollutants, or contaminants. The RCRA toxicity characteristics are an example of federal chemical-specific requirements. Potential chemical-specific, health-based guidelines for contaminated soil were presented earlier as proposed target action levels. Proposed target action levels are presented in Table 2-2 and Appendix A.

### *Location-Specific Requirements*

Location-specific requirements are design requirements or activity restrictions based on the geographic position of a site. An example is RCRA location requirements that set EPA policy for carrying out provisions of Executive Order 11988 (Flood Plain Management) and Executive Order 11990 (Protection of Wetlands). Potential location-specific requirements for the Woolfolk site are presented in Appendix C.

### *Action-Specific Requirements*

Action-specific requirements set performance, design, or other controls for particular activities involving the management of hazardous substances or pollutants. An example of an action-specific requirement is the design requirements for landfilling hazardous waste, established in RCRA Section 264.301. RCRA provides the most action-specific requirements because it regulates hazardous waste management. Potential action-specific requirements include RCRA's land disposal restrictions. The Georgia Site Response Act and rules promulgated there under are potential relevant and appropriate requirements.

DRAFT

Specifically, affidavit in county deed records and restrictive covenants are potential ARARs. These and other action-specific requirements for the Woolfolk site are presented in Appendix C.

## General Response Actions

General response actions are broad classes of responses or remedies developed to meet the remedial action objectives for the site. The remedial action objectives for the Woolfolk site were presented earlier in this chapter. Each action is intended to specifically address the contaminants and the possible migration pathways and exposure routes within each environmental medium or operable unit. Although each action may be capable of meeting the objective for a given medium, combinations of actions may later prove to be more cost-effective in meeting all the objectives for each medium.

### On-Site Soil and Existing Cap

The general response actions listed below have been identified as being potentially applicable for remediation of the soil at and around the Woolfolk site:

- No action
- Institutional actions
- Containment
- Removal
- Treatment
- Disposal

The *no action* alternative means that soil at the site would not be removed or treated. The no action response is included in the study because the NCP requires that a no action alternative be developed as a baseline for evaluation of remedial alternatives.

DRAFT

*Institutional response actions* are a category of general response actions that can be used singly or as part of an overall remediation alternative. Institutional controls of soil include such actions as land use restrictions, deed restrictions, and site fencing. The Georgia Hazardous Site Response Act has rules for affidavits in county deed records and restrictive covenants as institutional response action.

*Containment response actions* for soil include technologies that prevent the migration of and direct contact with contaminants. These actions include surface controls and capping. Surface controls include placement of asphalt, concrete, and vegetation; replacement of material that had to be excavated; regrading; and construction of stormwater sewers; and sidewalks.

The *removal response action* for soil is excavation.

*Treatment response actions* for soil reduce the toxicity, mobility, or volume of the contaminants. Treatment may include biological, thermal, physical, or chemical processes. The soil may be treated after excavation or in situ.

*Disposal response actions* for soil include on- and off-site landfilling in a Subtitle D- or Subtitle C-permitted landfill. Subtitle D landfills are not permitted to accept hazardous waste. Subtitle C landfills are permitted to accept hazardous waste.

## Structures

The general response actions listed below have been developed for the existing structures that may be contaminant sources on the Woolfolk site:

- No action
- Demolition
- Treatment

DRAFT

- Disposal
- Decontamination

The *no action response* means that the buildings at the Woolfolk site containing contaminants would not be treated. As with the response actions for the other media, the no action response for structures is included because the NCP requires that a no action alternative be developed. The no action response would be used as a baseline in evaluating the other response actions.

*Demolition response actions* include the total destruction of the contaminant source structures. Demolition remedial technologies include controlled blasting, wrecking with balls or rams, sawing, drilling, and crushing.

*Treatment response actions* reduce the toxicity, mobility, or volume of the contaminants in the debris of the demolished buildings. Treatment may include thermal, chemical, or physical processes such as incineration, solvent extraction, or solidification.

*Disposal response actions* for the contaminated or decontaminated debris from the demolished structures include on- or off-site disposal in a properly designed landfill.

The *decontamination response action* includes washing, sandblasting, vacuuming, or other means of removing contaminants from the surface of buildings that are contaminant sources. This response action can be performed as part of building rehabilitation or before demolition.

## Stormwater System

The general response actions listed below have been developed as being potentially applicable alternatives for remediation of the stormwater system at the Woolfolk site:

DRAFT

- No action
- Monitoring
- Decontamination
- Containment
- Collection
- Removal
- Disposal

The *no action response* is included in the study to serve as a baseline in evaluating all alternatives.

The *decontamination response action* is designed to remove sediment from the stormwater system. Decontamination technologies include manual excavation and hydraulic and mechanical cleaning.

The *containment response action* refers to measures taken to minimize additional contaminant migration. These include plugging portions or all of the system and abandoning the system in place.

*Collection response actions* are directed toward methods of accumulating sediment and other materials that may be in the stormwater conveyance system. These technologies include sediment basins and sumps that would likely be used during construction activities.

The *removal response action* is intended to physically remove the existing system by excavation to minimize further sediment migration.

The *disposal response action* includes on-site treatment or disposal and off-site commercial landfilling of the sediment.

DRAFT

## Identification and Screening of Technologies and Process Options

After response actions have been categorized, the next step in the screening process is to identify technologies for each general response action. In general, several technologies are capable of accomplishing a given general response action. In this section, the number of potentially applicable technology types is reduced by evaluating the response action with respect to technical implementability. The response actions are evaluated by using readily available site-specific information from the RI, such as contaminant types and site characteristics, to screen out technologies that cannot be implemented effectively. The preliminary screening of technologies for the general response actions is shown in tables 2-4, 2-5, and 2-6.

The technologies that were not eliminated in the preliminary screening process were evaluated in greater detail in order to eliminate non-viable technologies and to simplify the development and analysis of site alternatives. The technologies were evaluated using the criteria of effectiveness, implementability, and relative cost. These criteria were applied to the technologies and general response actions individually before they were combined to form alternatives that are specific to environmental media and operable units requiring remediation.

In the screening process, *effectiveness* pertains to:

- The ability of a technology or process option to handle the estimated areas or volumes of media and to prevent or minimize the release of hazardous substances to potential receptors

- The degree of protection afforded to human health and the environment during construction and implementation of the technology or process option

DRAFT

Table 2-4
PRELIMINARY SCREENING OF REMEDIAL TECHNOLOGIES FOR SOIL (ON-SITE AND EXISTING CAP)



| General Response Action | Remedial Action or Technology | Process Options | Description | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|
| | | | | Retain | Reject | |
| No Action | None | | | X | | Retain as baseline alternative |
| Institutional Actions | Land use restrictions | Fence site<br>Deed restrictions<br>Property acquisition<br>Restrictive covenants | Fence site to restrict access. Deed restrictions permanently prohibit certain activities on the property. Purchase properties to increase area required for remediation activities. | X | | Technically feasible |
| Containment | Capping | Multimedia | Contaminated materials covered to prevent direct contact and water infiltration and to control releases to the atmosphere. | X | | Technically feasible; multi-layered cap already exists at the site |
| | | Asphalt/concrete | Contaminated materials covered to prevent direct contact and water infiltration and to control releases to the atmosphere. | X | | Technically feasible; asphalt/concrete coverings already exist at the site |
| Removal | Excavation | | Remove contaminated soil for treatment and disposal. | X | | Technically feasible; many technologies require excavation before treatment |
| Treatment | Soil washing | | Ex situ leaching method using aqueous-based liquids to concentrate contaminants. | | X | Silty/clayey soil exists at the site, making this technology ineffective |
| | Soil flushing | | In situ leaching method using extraction wells and liquid treatment to remove contaminants from soil. | | X | Low permeability soil exists at the site, making this technology ineffective |
| | Biological | Ex situ/in situ aerobic/anaerobic | Enhanced biological degradation of contaminants under oxygen-rich (aerobic) or oxygen-starved (anaerobic) conditions. | | X | Technology not viable for inorganic contaminants found at site |
| | Stabilization/solidification | Ex situ/in situ | Physically or chemically binds contaminants in solidified matrix. | X | | Potentially viable for soils and contaminants (primarily inorganics) |
| | Vitrification | In situ | Soil heated and converted in place into durable glass-like material. | | X | Highly energy-intensive, not cost-effective; full-scale technology not commercially available |
| | Chemical dehalogenation | | Removes chlorine from waste, making waste less toxic. | X | | Potentially viable for chlorinated contaminants in the soil |

DRAFT

Table 2-4
PRELIMINARY SCREENING OF REMEDIAL TECHNOLOGIES FOR SOIL (ON-SITE AND EXISTING CAP)



| General Response Action | Remedial Action or Technology | Process Options | Description | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|
| | | | | Retain | Reject | |
| Treatment (cont.) | Solvent extraction | | Dissolves organic contaminants in contacting solvent, which is later treated. | X | | Only treats organics, not viable for arsenic treatment; potentially viable for organic soil contamination |
| | Low-temperature thermal treatment | Desorption | Desorbs organic compounds from soil at 500°F to 1,000°F. | X | | Only treats organics, not viable for arsenic treatment; potentially viable for organic soil contamination |
| | Incineration | On site/off site | High temperatures used to oxidize and thermally destroy organic compounds. | X | | Only treats organics, not viable for arsenic treatment; potentially viable for organic soil contamination |
| Disposal | Land disposal (on-site) | | Place treated or untreated material on portion of site under cap. | X | | Technically feasible, space constraints depending on waste volume |
| | Landfill (on-site) | | Construct a cell in accordance with Subtitle C or D standards, as applicable, for placement of material. | X | | Technically feasible, space constraints depending on waste volume |
| | Subtitle D landfill (off-site) | | Transport and dispose of untreated or treated material in a Subtitle D landfill. | X | | Viable, depending on contaminant concentrations |
| | Subtitle C permitted landfill (off-site) | | Transport and dispose of untreated or treated material in approved Subtitle C landfill. | X | | Technically feasible |

DRAFT

**Table 2-5**
**PRELIMINARY SCREENING OF REMEDIAL TECHNOLOGIES FOR STRUCTURES**



| General Response Action | Remedial Action or Technology | Process Options | Description | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|
| | | | | Retain | Reject | |
| No Action | None | Not applicable | No action. | X | | Retain as baseline alternative required by NCP |
| Demolition (on site) | Destruction of contaminated buildings | Burning | Controlled burning of wooden structures. | | X | May generate airborne contaminants in smoke |
| | | Blasting | Controlled blasting of structures. | | X | Dust generation, residential neighborhood nearby |
| | | Wrecking | Destroys structures with wrecking balls or backhoe-mounted rams. | X | | Technically feasible |
| | | Sawing/Cutting | Cuts structures or debris into smaller pieces by using saws, torches, etc. | X | | Technically feasible |
| | | Crushing | Crushes structures or debris into smaller pieces. | X | | Technically feasible |
| Treatment | Treatment of demolition debris | Incineration | Thermally destroys burnable debris. | X | | Potentially viable, however, does not destroy arsenic |
| | | Solidification/ stabilization | Converts contaminants to less soluble, mobile, or toxic form by chemical reaction or physical encapsulation. | X | | Potentially viable |
| Disposal | Land disposal (on-site) | | Place debris on portion of site under cap. | X | | Technically feasible |
| | Landfill (on site) | | Construct a cell in accordance with Subtitle C or D standards for placement of material. | X | | Technically feasible |
| | Subtitle D landfill (off-site) | | Transport and dispose of untreated or treated debris in Subtitle D landfill. | X | | Potentially viable depending on contaminant concentration |

DRAFT

**Table 2-5**
**PRELIMINARY SCREENING OF REMEDIAL TECHNOLOGIES FOR STRUCTURES**



| General Response Action | Remedial Action or Technology | Process Options | Description | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|
| | | | | Retain | Reject | |
| Disposal (cont'd) | Subtitle C permitted landfill (off-site) | | Transport and dispose of untreated or treated debris in Subtitle C landfill. | X | | Technically feasible |
| Decontamination | Decontamination of on-site and off-site buildings | Vacuuming/wiping | Physically removes hazardous dust and particles by common cleaning methods. | X | | Potentially viable for both on- and off-site structures |
| | | Blasting | Abrasive material is used for uniform removal of contaminants. | X | | Potentially viable for only on-site structures |
| | | Washing | High-pressure water or solvent is used to remove contaminants from surfaces. | X | | Potentially viable for both on- and off-site structures |
| | | Painting/coating | Coatings are sprayed on contaminated surfaces to fix or stabilize contaminants in place. | X | | Potentially viable for only off-site structures |
| | | Scarification | Scarifier tool is used to chip off contaminated layer of concrete. | | X | Not applicable to the structures at the site |
| | | Steam cleaning | Steam is used to physically extract contaminants from building materials. | X | | Potentially viable for both on- and off-site structures |
| | | Microbial degradation | Aqueous microbes are sprayed onto contaminated area and allowed to digest contaminants. | | X | Contaminant concentrations are too high |



WDCR859/009.WP5

Table 2-6
PRELIMINARY SCREENING OF REMEDIAL TECHNOLOGIES FOR STORMWATER SYSTEM



| General Response Action | Remedial Action or Technology | Process Options | Description | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|
| | | | | Retain | Reject | |
| No Action | None | No monitoring | No action. | X | | Retain as baseline alternative |
| Monitoring | TV camera | | Periodic TV-camera monitoring of pipes and sampling of sediment. | X | | Technically feasible |
| Decontamination | | Removal by hand | Enter the sewer system and shovel out sediments. | | X | Not viable because of size of pipes |
| | | Mechanical rodding | Conventional mechanical cleaning of sewer by rodding (sewer snake). | X | | Potentially viable |
| | | Hydraulic flush | Conventional washing by hosing sewer interior manually. | | X | Not viable because of size of pipes |
| | | Hydraulic slug | Flood an upstream portion of sewer system, then release a hydraulic slug to scour inside of pipe. | X | | Potentially viable |
| | | Balling | Hydraulic-cleaning method in which water head creates high-velocity water flow around inflated, spiral-threaded cleaning ball. | X | | Potentially viable |
| | | Jetting | Hydraulic-cleaning method that directs high velocities of water against the pipe walls at various angles. | X | | Potentially viable |
| | | Scooter | Metal shield on wheels that uses pressure of water behind shield to move assembly, while water forces past rim and scours pipe wall. | X | | Potentially viable |
| | | Kites, bags, poly pigs | Water pressure forces rigid-rimmed devices downstream causing a scouring action along pipe wall. | X | | Potentially viable |
| | | Bucket machine | Mechanical cleaning device that captures entrained solids. | X | | Potentially viable |

**Table 2-6**
**PRELIMINARY SCREENING OF REMEDIAL TECHNOLOGIES FOR STORMWATER SYSTEM**



| General Response Action | Remedial Action or Technology | Process Options | Description | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|
| | | | | Retain | Reject | |
| Containment | Barrier | Plug | Abandon-in-place and plug all openings with concrete. | X | | Potentially viable |
| | | Seal | Seal inside of sewer with high-density polyethylene compression liner. | X | | Manufacturer requires cleaning pipe before sealing; may be used for pipe improvements |
| Removal | Excavation | Excavation | Dig up stormwater sewer and channels. | | X | Not feasible; pipe is located under several buildings |
| Disposal | On-site | Landfilling | On-site landfill. | X | | Potentially viable |
| | Off-site | Landfilling | Off-site landfill. | X | | Potentially viable |

DRAFT

- The reliability and performance of the technology or process option with respect to the site conditions

*Implementability* pertains to:

- The availability and capacity of off-site treatment, storage, and disposal services

- The constructibility of the technology or process option under site conditions

- The time needed to implement the technology or process option, to achieve beneficial results, and to satisfy the remedial action objectives

Relative cost screening considered the general capital and operation and maintenance (O&M) costs for the process options. Detailed, site-specific cost estimates were not developed. The relative cost of process options was considered only if the cost of an option was believed to be significantly higher than the cost for other process options having comparable effectiveness or implementability. Therefore, the emphasis was placed on effectiveness and implementability.

Where possible, a single process option was selected as representative of a general response action. In some cases more than one process option was selected because the options could not be differentiated in terms of effectiveness, implementability, or relative cost. The following sections discuss the technologies and process options that passed the effectiveness, implementability, and cost screening.

DRAFT

## Soil

Table 2-7 presents an evaluation of the soil technologies and process options that were not eliminated during preliminary screening. The technologies that passed this screening for soil are discussed below.

### *No Action*

This alternative serves as a baseline against which other technologies can be judged. No action would not reduce the volume, mobility, or toxicity of the contaminants. This alternative does not meet the remedial objectives of the FS; however, it would be retained for consideration as required by the NCP.

### *Institutional Actions*

Institutional actions are response actions designed to provide some control over site conditions. Institutional actions may be used singly or as part of an overall alternative. One type of institutional action, land-use restrictions, has been retained for future discussion.

Land-use restrictions may be used to prevent or reduce future human or environmental exposure to contaminants remaining at the site. Land-use restrictions consist of deed restrictions and restrictive covenants, or other actions to minimize potential exposure at the site. This alternative is designed to temporarily or permanently prohibit activities on any part of the site that contains hazardous materials. This measure does not reduce the volume, mobility, or toxicity of the contaminants, but does provide some degree of protection to human health by diminishing the potential for exposure. Land-use restrictions potentially would be used in conjunction with other technologies to provide additional protection to the population and the environment. Implementing this technology is estimated to be relatively inexpensive.

DRAFT

**Table 2-7**
**EVALUATION OF REMEDIAL PROCESS OPTIONS FOR SOIL (ON-SITE AND EXISTING CAP)**



| General Response Action | Remedial Action or Technology | Process Options | Effectiveness | Implementability | Cost | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Retain | Reject | |
| No Action | None | Not applicable | Not effective. Does not meet remedial action objectives. | Easily implemented. Alternative required by NCP. | None | X | | Baseline alternative. |
| Institutional Actions | Land-use restrictions | Fence site<br>Deed restrictions<br>Property acquisition<br>Restrictive covenants | Does not reduce contamination. Effectiveness depends on continued implementation. Property acquisitions effective in providing a buffer between the local residents and the site. | Legal requirements and authority required. | Low | X | | Will be used with other technologies. |
| Containment | Capping | Asphalt/concrete | Effective in preventing contact with contaminants. Some capping materials may crack; continuous O&M needs to be performed. | Easily implemented. May be used with land-use restrictions. | Low capital, low O&M | X | | Contaminated soil remains in place. Cap requires periodic monitoring and repair. Reduces exposure to contaminants. |
| | | Multimedia | Effective in preventing contact with contaminants. Some capping materials may crack; continuous O&M needs to be performed. | Easily implemented, except near structures and utilities. May be used with land-use restrictions. | Moderate capital, low O&M | X | | Contaminated soil remains in place. Cap requires periodic monitoring and repair. Reduces exposure to contaminants. Would be used in conjunction with on-site landfilling. |
| Removal | Excavation | | Effective and reliable method of soil removal. Prevents long-term exposure to contaminated soil. May generate material requiring further treatment. May increase short-term exposure. | Easily implemented, except near structures and utilities. Proven technology. | Low capital, no O&M | X | | Required by many treatment and disposal technologies. |
| Treatment | Stabilization/ solidification | Ex situ/in situ | Effective in reducing the mobility and solubility of contaminants in soil as shown during treatability testing. | Easily implemented. Many vendors available. | Moderate capital, low O&M | X | | Large reduction in the mobility of contaminants is possible. Effective in reducing the mobility of arsenic. |
| | Chemical dehalogenation | | Not effective on metals in soil. May not completely dechlorinate some organic compounds. Effectiveness reduced in fine-grained material. | Not easily implemented. Few vendors available. | High capital, moderate O&M | | X | Low effectiveness and implementability due to site contaminants and soil conditions. Does not treat arsenic, therefore, does not significantly reduce risk posed by the site. Not cost-effective. |

DRAFT

**Table 2-7**
**EVALUATION OF REMEDIAL PROCESS OPTIONS FOR SOIL (ON-SITE AND EXISTING CAP)**



| General Response Action | Remedial Action or Technology | Process Options | Effectiveness | Implementability | Cost | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Retain | Reject | |
| Treatment (cont'd) | Solvent extraction | | Not effective on metals in soil. Generates solution requiring further treatment. Effectiveness reduced in fine-grained material. Unproven for site remediation. | Not easily implemented. Few vendors available. Requires storage area for solvent. | High capital, moderate O&M | | X | Low effectiveness due to site contaminants and soil conditions. Does not treat arsenic, therefore, does not significantly reduce risk posed by the site. Not cost-effective. |
| | Low-temperature thermal treatment | Desorption | Effective in removing only organic contamination as shown by treatability study. Inorganics are not treated, therefore, the risk at the site is not significantly reduced. May increase short-term exposure via air emissions. | Not easily implemented. Few vendors available. Liquid condensate will require further treatment (i.e., incineration). Soil will require further treatment for inorganics. | High capital, high O&M | | X | Reduces organic contamination in the soil, however, does not significantly reduce the risk posed by the site. Therefore, not cost-effective. |
| | Incineration | On site/off site | Effective method for treating soil and liquid contaminated by organics. Not effective on metals in soil. | Unit on the site would require permitting and location of the site in a residential setting is not conducive to implementation | High capital, high O&M | | X | Implementability very low for site and cost very high for off-site treatment. Does not significantly reduce the risk posed by the site. Not cost-effective. |
| Disposal | Land disposal (on-site) | | Effective when used in conjunction with another technology | May be subject to space constraints. | Low capital, low O&M | X | | Viable. May be used in conjunction with other technologies. |
| | Landfill (on-site) | | Effective in isolating contaminated material. Material may require pretreatment. | May be subject to space constraints. | Moderate capital, low O&M | X | | Potentially viable. Subject to regulatory constraints. |
| | Subtitle D landfill (off-site) | | May be effective when used in conjunction with other technologies | Easily implemented, if accepted by disposer. | Moderate capital, no O&M | X | | Potentially viable. May be used in conjunction with other technologies. |
| | Subtitle C-permitted landfill (off-site) | | Effective in isolating contaminated material. | Limited availability of regional disposal contractors. Regulatory constraints may affect implementability. | High capital, no O&M | X | | Potentially viable. Subject to regulatory constraints. |

## *Containment*

The containment alternative that was retained was capping. In capping, contaminated materials are covered to prevent direct contact with receptors and to control the infiltration of water. Capping with a low-permeability or impermeable material is a viable technology that by physically isolating the contaminants minimizes both public exposure and exposure to water. Capping does not reduce the volume or toxicity of the contaminants.

Capping is considered to be a standard construction procedure and is easily implemented. In order to ensure cap integrity, the grading of the cap and the area around it would be altered to divert surface runoff away from the area. Construction costs are relatively low to moderate. Operation and maintenance is minimal, with only periodic inspection and repair required. Potential adverse effects during implementation include noise, fugitive dust, and exhaust emissions during construction. Worker exposure to the contaminants during construction can be minimized by using personal protective equipment (PPE).

DRAFT

## *Removal*

Excavation is a proven method of removing contaminated surface and subsurface materials from hazardous waste sites. Excavation includes scraping, cutting, digging, scooping, or vacuuming. Excavation is used in conjunction with other technologies.

Excavation is a standard construction procedure and is easily implemented. Adverse effects of excavation include fugitive dust, noise, exhaust emissions, and the hazards of working around heavy machinery. Control of fugitive dust would be of particular concern. Worker safety can be improved through the use of PPE and environmental monitoring. Because excavation is very common, costs are relatively low and are easily implemented.

## *Treatment*

Treatment response actions are designed to reduce the toxicity, mobility, or volume of the contaminants and to meet the FS objectives. One technology—stabilization/solidification (S/S)—has been retained for further study.

Stabilization/solidification is designed to limit the solubility of hazardous constituents in the waste, improve the handling and physical characteristics of the waste, and decrease the surface area of the waste where release of contaminant can occur. S/S has been effective on both inorganic and organic contaminants. S/S uses a mix of inorganic reagents (i.e., cement, fly ash, and lime) and the waste to form a chemically and mechanically stable solid. This technology can be carried out in situ or ex situ.

S/S is effective in reducing the mobility of the contaminants present, as demonstrated during treatability testing. Implementation is relatively easy because many S/S vendors are available and the process is similar to mixing and handling concrete. Costs associated with the technology are low to moderate. Costs tend to be based on the amount of reagent, including proprietary additives, that is required to treat the waste. During implementation of the alternative, workers would be required to use PPE. If ex situ S/S is implemented, the contaminated soil would have to be excavated, generating dust and exhaust gases. The solidified ex situ material can be disposed of at the site or at a commercial landfill. In situ S/S would reduce exposure to dust because excavation would not be required.

## *Disposal*

Disposal response actions were developed as the final step in meeting remedial objectives. On-site disposal and off-site disposal have been retained as possible methods of disposing of the material.

DRAFT

On-site soil consolidation (land disposal) has been retained for consideration. This technology would be used with other technologies for soil remediation (i.e., capping). Under the Corrective Action Management Unit (CAMU) regulations, remediation waste can be moved within the CAMU without the LDRs becoming applicable. Since the wastes would be left on the site, long-term monitoring would be required.

Another disposal technology is the construction of an on-site lined landfill. Waste can be deposited in the landfill without treatment if the landfill is within the CAMU where the waste is originating. This technology is relatively costly compared to capping because it requires construction of a liner system and a leachate- and runoff-collection system. Under CERCLA, Subtitle C or D landfill does not have to be permitted, but must conform to RCRA and state standards.

Both types of disposal technologies are subject to state and federal regulations. Constructing a disposal area at the site would minimize disposal costs because transportation costs and disposal fees are eliminated.

Characteristic hazardous waste can be transported to a Subtitle D landfill if it is treated to levels at or below those required by LDRs. Disposal in a Subtitle D landfill is subject to availability of space and acceptance of the waste. Costs associated with disposal in a Subtitle D landfill, if available, are considered relatively low when compared with Subtitle C landfill.

## Structures

Table 2-8 presents an evaluation of the remediation technologies and process options that were not eliminated during preliminary screening for the on-site structures that may be contaminated. The discussion below presents the technologies and process options that passed the effectiveness, implementability, and cost screening criteria.

DRAFT

Table 2-8
EVALUATION OF REMEDIAL PROCESS OPTIONS FOR STRUCTURES



| General Response Action | Remedial Action or Technology | Process Options | Effectiveness | Implementability | Cost | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Retain | Reject | |
| No Action | None | Not applicable | Does not protect human health or environment. | Does not satisfy remedial action objectives. | None | X | | Baseline alternative |
| Demolition (on-site) | Destruction of on-site buildings | Wrecking | Effective and reliable. Prevents long-term exposure to contaminated structures. | Readily implemented for on-site wooden structures. | Low capital, no O&M | X | | Efforts must be made to minimize airborne contaminants |
| | | Sawing/cutting | Effective and reliable. Prevents long-term exposure to contaminated structures. | Readily implemented for on-site wooden structures. | Low capital, no O&M | X | | Efforts must be made to minimize airborne contaminants |
| | | Crushing | Effective and reliable. Prevents long-term exposure to contaminated structures. | Readily implemented for on-site wooden structures. | Low capital, no O&M | X | | Efforts must be made to minimize airborne contaminants |
| Treatment | Treatment of demolition debris | Incineration | Effective and reliable treatment method for organic pesticides. | Currently one permitted off-site facility for dioxins. | High capital, high O&M | | X | Currently one permitted offsite commercial site; however, arsenic concentration exceeds facility's permit feed limitation |
| | | Solidification/ stabilization | May be effective for treating debris. | Debris would need to be crushed into very small pieces. | Low capital, moderate O&M | X | | May be required before disposal |
| Disposal | Disposal of demolition debris | On-site land disposal | Effective when used with another technology. | Requires regulatory approval and permitting. May be subject to space constraints. | Low capital, moderate O&M | X | | Potentially viable |
| | | On-site landfill | Effective in isolating contaminated material. Material may require treatment. | Requires regulatory approval and permitting. May be subject to space constraints. | Moderate capital, low O&M | X | | Potentially viable |
| | | On-site temporary storage | Not a permanent remedy. Prevents short-term exposure to contaminants. Does not satisfy remedial action objectives. | Readily implemented. | Moderate capital, low O&M | X | | Potentially viable (for Building E only) |

Table 2-8
EVALUATION OF REMEDIAL PROCESS OPTIONS FOR STRUCTURES



| General Response Action | Remedial Action or Technology | Process Options | Effectiveness | Implementability | Cost | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Retain | Reject | |
| Disposal (cont'd) | Disposal of demolition debris (cont'd) | Off-site Subtitle D landfill | Effective when used with another technology. | May require regulatory approval and permitting. Subject to availability. | Moderate capital, no O&M | X | | Potentially viable |
| | | Off-site Subtitle C landfill | Effective in isolating contaminated material. Material may require treatment. | Limited availability of vendors. | High capital, no O&M | X | | Potentially viable |
| Decontamination | Decontamination of contaminated on-site structures | Vacuuming/wiping | Effective technology for removing contaminated dust from structures. | Readily implemented. Dust collected requires further treatment. | Low | X | | Good for on-site structures by itself or may be done before demolition |
| | | Blasting | Generates large amounts of dust and debris. Not appropriate for residences or dioxin-contaminated structures. | Large number of contractors available. | Moderate | | X | Generates airborne contaminants |
| | | Washing | Effective for surface contaminants. May not remove contaminants that have penetrated surface. Not effective on wood. | Large number of contractors available. Generates large amount of contaminated water. | Moderate | X | | Good for on-site structures by itself or may be done before demolition |
| | | Painting/coating | Minimizes human contact with contaminants but does not remove them. Not a long-term effective action. Does not satisfy remedial action objectives. | Readily implemented, requires long-term monitoring. | Low | | X | Does not remove contaminants. Does not satisfy remedial action objectives |
| | | Steam cleaning | Effective removal of contaminants from surface of structures. | Labor-intensive, generates large amount of contaminated water. | Moderate | X | | Viable for on-site structures by itself or may be done before demolition |

DRAFT

### *No Action*

The no action response action is required by the NCP and was retained to provide a basis for comparison with the other actions. However, this option does not reduce the contamination present in the structures and does not meet the remedial action goals of the FS.

### *Demolition*

Several of the wooden structures at the Woolfolk site are known or suspected to be contaminated with pesticides, which presents risk to on-site workers and a contaminant source. Building E has already been demolished. Building W would also be demolished.

The demolition process options that passed the screening include wrecking, sawing, cutting, and crushing. Each of these options would effectively reduce the size of the contaminated structures so that the debris can be treated and/or disposed of. The equipment used for these options (wrecking balls, backhoes, saws, torches, etc.) are all readily available and the associated costs are low. Care must be taken during the demolition, however, to minimize airborne contaminants. This can be accomplished by spraying the structures and surrounding areas with water or other dust suppressants to minimize dust.

### *Treatment*

After the contaminated structures are demolished, the resulting structural debris may need to be treated to reduce the contaminant levels before disposal. The two treatment methods that were not eliminated during initial screening were incineration and S/S.

Currently, there is one incinerator permitted and accepting dioxin-contaminated materials. The incinerator, located in Coffeyville, Kansas, has restrictions on the characteristics of the waste streams it can accept. Its permit feed limitation for arsenic is 302 ppm for bulk

DRAFT

waste. Based on analytical data from wood and soil sampling of Building E, the waste is not acceptable because of the arsenic concentration. The two wood samples contained 72,400 and 11,100 mg/kg of arsenic. Three soil locations were sampled at depths of 1, 2, and 3 feet. The range of arsenic concentrations is 63 mg/kg to 2,790 mg/kg with an average concentration of 1,191 mg/kg.

Solidification/stabilization may be used to reduce the mobility of the contaminants on the debris before disposal. The decision to stabilize the debris would be made after samples of the debris have been analyzed to determine if it is hazardous by toxicity characteristic. If the concentrations exceed regulatory limits, then the debris would need to be stabilized. For stabilization to be effective, the debris must be broken into small pieces, which would increase both the time required to implement the process and the costs.

### *Disposal*

Four disposal options for the demolition debris were not eliminated during screening: on-site land disposal, on- or off-site landfilling, and temporary storage in an on-site RCRA facility (for Building E soil and debris only). The first three options are the same options that were selected for the contaminated soil at the site. The last option is the only option currently available for "disposing of" dioxin-contaminated soil and debris. No off-site landfills accept dioxins, and the current regulations would not permit the construction of an on-site landfill for dioxins. The on-site storage facility would need to be constructed to the specifications outlined for a RCRA-type storage facility.

### *Decontamination*

On-site structures may be decontaminated as much as possible before demolition. Several decontamination process options passed the screening, including vacuuming and/or wiping, washing, and steam cleaning the structures' surfaces. All other decontamination options were determined to generate a significant amount of dust or did not meet the remedial

DRAFT

action objectives for structures. According to the *US EPA Guide for Decontaminating Buildings, Structures, and Equipment at Superfund Sites*, dusting/vacuuming/wiping is the state-of-the-art method for removing contaminated dust from structures and is applicable to metals and pesticides. The dust that is captured during the remediation process then requires further treatment or disposal. The costs of implementing this technology are relatively low.

## Stormwater System

Table 2-9 presents an evaluation of the stormwater system remediation technologies that were not eliminated during preliminary screening. The viable technologies that are applicable to the stormwater system and that passed the screening are discussed below.

### *No Action*

No action means that the stormwater system would not be decontaminated. This alternative serves as a baseline against which other technologies can be judged. This alternative does not meet the remedial objectives of the FS; however, it would be retained for consideration as required by the NCP.

### *Monitoring*

Environmental monitoring consists of using a TV camera to inspect pipes and of sampling sediment. This response is easily implemented and is considered to be routine maintenance of storm sewer pipe. These technologies do not meet the remedial objectives, rather, they support alternatives that would meet the remedial objectives.

TV-camera inspection requires a sled-mounted camera that is pulled through the storm sewer. The sled contains the camera, lights, and cables. The sled and wiring are connected to a reel and truck on top of the ground. Personnel in the truck provide a running

DRAFT

Table 2-9
EVALUATION OF REMEDIAL PROCESS OPTIONS FOR STORMWATER SYSTEM



| General Response Action | Remedial Action or Technology | Effectiveness | Implementability | Cost | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|---|
| | | | | | Retain | Reject | |
| No Action | None | Not effective. Does not meet remedial action objectives. | Easily implemented. Alternative required by NCP. | None | X | | Retain as baseline alternative |
| Monitoring | TV camera | Effective to locate sediment deposits and allow sampling. | Moderatly difficult to obtain samples from long pipe reaches. | Low | X | | Important to determine effectiveness of remediation actions |
| Decontamination | Mechanical rodding | Effectively removes blockages, larger debris, gravel; not effective removing fine sediments. | Easy, conventional. Less efficient in larger lines. Equipment not large enough for 48-inch line. | Low | | X | Equipment not large enough for 48-inch line |
| | Balling | Effective in removing settled deposits of grit or grease. | Largest size is for 45-inch pipe. Balls become unmanageable in larger lines. | Low | | X | Implementation will be difficult |
| | Jetting | Effectively removes sediment buildup and debris. Can clear stoppages caused by debris. | Efficient for routine cleaning of storm sewers. Truck-mounted units used with vacuuming. | Low | X | | Effective when used in conjunction with vacuuming |
| | Scooter | Equipment effective in creating water turbulence for scouring effect. | Shields are available for 48-inch pipes. Water depth of three times pipe diameter allows sufficient head for cleaning. | Low | | X | Will not be able to create head required for cleaning |
| | Kites, bags, poly pigs | Effective in creating scouring effects on pipe walls. | Poly pig used for large pipes. Water pressure provides driving force. | Low | | X | Large enough head for operation is not feasible |
| | Bucket machine | Effective in partially removing large deposits of silt, sand, gravel, and some types of solid waste. | Sizes are up to 36 inches in diameter. | Low | | X | Existing pipe is larger than equipment |
| | Hydraulic slug | Effective for removing fine sediments; not effective for removing debris and gravel. | Easy to implement. | Low | | X | Requires great volume of water to flush, which must be collected and treated |

DRAFT

**Table 2-9**
**EVALUATION OF REMEDIAL PROCESS OPTIONS FOR STORMWATER SYSTEM**



| General Response Action | Remedial Action or Technology | Effectiveness | Implementability | Cost | Screening Action | | Screening Comments |
|---|---|---|---|---|---|---|---|
| | | | | | Retain | Reject | |
| Containment | Seal pipe with HDPE | Effective in lining the existing pipe. Improves flow characteristics and structural integrity. | Difficult to implement. The existing line needs to be in relatively good condition. Restricted access makes working conditions difficult. | High | | X | Because of its relatively high cost, this technology was not retained |
| | Seal pipe with concrete, construct new pipe | Moderately effective depending on condition of existing pipe. Not effective with old, deteriorated pipe. | Easy, conventional. | Moderate to high | X | | This action would be performed if the pipe could not be decontaminated. |
| Disposal | On-site | Effective in minimizing sediments from further migrating. | Will be combined with soil option. May be subject to LDRs. | Low | X | | Viable disposal option |
| | Off-site commercial landfill | Effective disposal method. Removes any contact from migration or infiltration from the site. | May be subject to LDRs. Subject to landfill availability and acceptance. | Moderate | X | | Viable disposal option |

DRAFT

commentary on the status and location of the sled during inspection. Some camera systems have been adapted for larger pipes. A system for swiveling the lights and camera in the vertical and horizontal planes has been developed. Available equipment typically allows a maximum of 2,000 feet between surface access points.

For longer stretches of pipe without access, a photographic camera and strobe lights can be used. Less power is required; however, the inspection is less precise because photographs are taken at 5- to 10-foot intervals.

Sampling of sediment is a routine procedure. Sediment can be sampled manually or by sending a bucket down the pipe.

### *Decontamination*

The decontamination response action is designed to remove sediment and accumulated debris from the stormwater system. Jetting followed by vacuuming is the decontamination technology that has been retained for consideration. Decontamination would remove sediments from the stormwater system thus reducing the migration of the material away from the site. After the material has been recovered, it can be disposed of properly.

Jetting is carried out by inserting a multi-directional nozzle upstream of the pipe length to be cleaned. A vacuum assembly is placed in the pipe downstream of the nozzle. Water is sent through the nozzle and scours and loosens the sediment. The nozzle is pulled downstream, washing the material toward the vacuum. The water and sediment are vacuumed into the tank truck running the equipment. The sediment is allowed to settle out. The water and sediment then are disposed of properly.

This type of equipment can process 400 to 500 feet of pipe at one location. A daily production rate of 800 to 1,000 feet of pipe can be expected if the volume of sediment is less than a third of the pipe diameter. The jetting equipment uses 7,000 to 10,000 gallons

DRAFT

of water per day. The major system requirements are a supply of water and a place to dispose of the residual solids. The water and the sediment must be analyzed to determine whether treatment is necessary and what options are appropriate for disposal.

### *Containment*

The containment response action refers to measures taken to minimize additional sediment migration. This action is designed to reduce the contact between sediment and stormwater and to prevent migration of contaminated sediment.

One containment technology to be studied further is sealing the existing pipe with concrete and installing a new stormwater sewer. With this alternative, the stormwater line that runs under the site is abandoned and a new line is installed. Concrete is pumped into the existing line running beneath the site through the stormwater catch basins. This prevents any sediment in the pipe from migrating further. Then a new line is installed and tied into the site's catch basins. The new line may run along Preston Street on the western side of the site. The new line would collect run-off from the remediated site. Stormwater that runs off newly improved or capped surfaces would not be contaminated.

Abandonment of the line would require filling in approximately 3,500 feet of pipe located under the site. Approximately 750 $yd^3$ of grout would be required to fill the stormwater system.

This action would be performed only if the on-site portion of the stormwater sewer could not be decontaminated.

DRAFT

## *Disposal*

The disposal response action addresses potential methods for managing the sediment after it is removed from the pipe. The sediment must be disposed of in a way that minimizes the potential for contact with the people or the environment. The two options retained for consideration are on-site disposal and off-site commercial landfills.

Before establishing the method of disposal that would be used, the sediment would have to be sampled and analyzed to determine if hazardous. The amount of sediment in the pipe is unknown. However, assuming the pipe has 3 inches of sediment over a distance of 3,200 feet (the distance to the exit pipe on Preston Street by Beech Street), approximately 40 $yd^3$ of material would be removed.

If the material is hazardous it can be managed by the on-site soil alternative. On-site disposal includes treating or capping the material. If the material is not hazardous, it may still be treated or capped, but also can be used as fill or cover. The amount of sediment that can be removed from the storm sewer is very small when compared to the amount of soil that must be managed.

For off-site disposal, the two alternatives may be disposal at a landfill or at a RCRA TSDF. Commercial landfills can be used if the material is not hazardous. These landfills would use the material as cover. Disposal at a commercial landfill is subject to acceptance by the landfill. If the material is found to be hazardous because of arsenic contamination, it can be treated to meet LDRs or can be directly transported to a TSDF. If the material is to be treated, it would have to be stabilized. After the material is treated and can meet LDRs, it can be landfilled. The sediment, if hazardous, would be subject to landfill approval.

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DRAFT

## Chapter 3

# Development and Screening of Remedial Action Alternatives

## Introduction

CERCLA amendments, Section 121(b), indicate the following statutory preferences when developing and evaluating remedial alternatives:

- Remedial actions that involve treatment to permanently and significantly reduce the volume, toxicity, or mobility of the contaminants or hazardous substances are preferred over remedial actions not involving such treatment.

- Off-site transport and disposal of hazardous substances or contaminated materials without treatment is considered the least-favored remedial action when practical treatment technologies are available.

- Remedial actions using permanent solutions, alternative treatment technologies, or resource-recovery technologies shall be addressed.

Because of the statutory preferences, emphasis has been placed on developing alternatives that permanently and significantly reduce the volume, toxicity, or mobility of the waste. Furthermore, alternatives have been developed to attain the remedial action objectives.

The technology screening that is described in Chapter 2 was used to compile technologies into alternatives that would meet their respective remedial action objectives for given environmental media or operable units. Remedial objectives were developed for on-site soil, off-site soil, the existing cap (same as on-site soil), structures, and stormwater system. Table 3-1 summarizes the remedial action objectives.

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| Table 3-1<br>SITE-SPECIFIC REMEDIAL ACTION OBJECTIVES | |
|---|---|
| On-Site Soil | Limit exposure of workers to on-site soil that contains contaminant concentrations above the proposed target action levels specified in Table 2-2. |
| | Limit off-site migration by stormwater and wind erosion of contaminated on-site soil above proposed target action levels. |
| | Limit leaching of contaminants in on-site soil with contaminant concentrations greater than proposed levels presented in Table 2-3. |
| Off-Site Soil | Limit exposure to off-site soil in residential settings with contaminant concentrations above the proposed target action levels specified in Table 2-2. |
| | Limit exposure to off-site soil in nonresidential settings with contaminant concentrations greater than the proposed target action levels specified in Table 2-2. |
| Structures | Prevent the recontamination of on-site soil from continued operations in buildings that cannot be rehabilitated (Building W). |
| | Prevent direct contact with soil containing dioxin concentrations that exceed proposed levels specified in Table 2-2 (Building E). |
| Stormwater System | Limit direct contact and further migration of sediment from the stormwater sewer containing contaminant concentrations above proposed levels specified in Table 2-2. |

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## Screening of Alternatives

The NCP requires that the remediation alternatives be subjected to an initial screening to eliminate those that could cause adverse effects on human health and the environment, are not applicable to the contaminants and media at the site, or are much more expensive to implement than other alternatives that provide essentially the same level of protection. The screening criteria are based on short- and long-term effectiveness, implementability, and cost. Short-term aspects cover the implementation and completion of the treatment alternative and long-term aspects cover the period after the termination of treatment. The screening criteria are described below.

- **Effectiveness**: The effectiveness evaluation considers the ability of each remedial alternative to protect human health and the environment. Each alternative is screened according to the protection it would provide and the reduction in contaminant toxicity, mobility, or volume it would achieve.

- **Implementability**: The implementability screening would be used to measure both the technical and administrative feasibility of constructing, operating, and maintaining a remedial action alternative. Aspects of this screening are the availability of the technologies and vendors and the regulations that may be applicable.

- **Cost**: The focus of the cost screening is comparative estimates for alternatives that are relatively accurate (+100 percent to -50 percent) so that decisions among alternatives that are based on cost would be sustained as the accuracy of cost estimates improves beyond the screening process. The cost screening considers the capital costs.

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## Development of Remedial Action Alternatives

The technologies that remain after being screened, as described in Chapter 2, are assembled in this chapter into remedial action alternatives by environmental media or operable units. Alternatives for on-site soil, the contaminated soil under the existing cap, structures, and stormwater sewer system have been developed and screened. The alternatives developed are intended to represent a wide range of remedial actions in terms of both costs and levels of protection of human health and the environment. These actions have been developed to meet the remedial action objectives, which focus on reducing human exposure to the contaminants and minimizing contaminant migration.

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## Remedial Action Alternatives: On-Site Soil

Eight remedial alternatives were developed for the soil above the target action levels located on the site (Figure 3-1). The alternative screening evaluation is summarized in Table 3-2.

### *On-Site Soil Material Quantity Estimates*

Action levels for on-site soil were determined on the basis of the risk assessment; the fate and transport modeling described in Appendix B, and the action levels implemented during the removal action. The action levels were presented in the previous chapter. On the basis of these action levels and the distribution of contaminants across the site, arsenic is the controlling contaminant. The on-site soil action level for arsenic has preliminarily been set by EPA at 300 mg/kg for areas that will be paved and 100 mg/kg for areas that will not be paved. On the basis of the RI data, approximately 10,000 cubic yards of soil would have to be managed (capped, excavated, or treated) from the top 1 foot of on-site soil. Additional soil management to 4 feet and 8 feet would result in approximately 6,100 cubic yards and 2,400 cubic yards, respectively. The anticipated total amount of on-site soil to be managed is 18,500 cubic yards.

Variations to these estimated quantities are described under each alternative. Figure 3-2 illustrates the current on-site soil management areas. Appendix D presents the material quantity estimates by alternative.

### *Alternative ON1: No Action*

The no action alternative, required by the NCP, is the baseline alternative against which the effectiveness of other remedial alternatives would be judged. Under this alternative no control or remediation would take place. (Retained.)

DRAFT

| Action or Technology | ON1 No Action | ON2 Land Improvements for Commercial/Industrial Development | ON3 On-Site Subtitle C Landfill | ON4 S/S Treatment Backfill | ON5 In Situ S/S Treatment | ON6 S/S Treatment and On-Site Subtitle C Landfill | ON7 On-Site Subtitle C and D Landfills | ON8 S/S Treatment and Landfill Off-Site |
|---|---|---|---|---|---|---|---|---|
| | Alternatives | | | | | | | |
| No Action | ● | | | | | | | |
| Land-use Restrictions/Restrictive Covenants | | ● | ● | ● | ● | ● | ● | |
| Land Improvements | | ● | ● | ● | ● | ● | ● | ● |
| Excavation | | ● | ● | ● | ● | ● | ● | ● |
| Ex Situ Stabilization/Solidification | | | | ● | ● | ● | | ● |
| In Situ Stabilization/Solidification | | | | | ● | | | |
| On-Site Disposal (Subtitle C Landfill) | | | ● | | | ● | ● | |
| Off-Site Disposal (Subtitle C Landfill) | | | | | | | | ● |
| On-Site Disposal (Subtitle D Landfill) | | | | | ● | | ● | |

**Figure 3-1**
PRELIMINARY ON-SITE SOIL ALTERNATIVES

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Table 3-2
REMEDIAL ACTION ALTERNATIVE SCREENING—ON-SITE SOIL



| Alternative | Effectiveness | Implementability | Cost[1] | Screening Action | | Comments |
|---|---|---|---|---|---|---|
| | | | | Retain | Reject | |
| ON1 No Action | None | None | None | X | | Retain as baseline alternative. |
| ON2 Land Improvement—for Industrial/Commercial Development | Eliminates long-term on-site worker contact with contaminated soil, providing land-use restrictions over entire site are adhered to. Soil above action levels left in place requires land-use restrictions and long-term maintenance. | Uses standard construction practices and will require periodic inspections and maintenance. Least disruption to existing operations. | $1.5 | X | | Reduces mobility of contaminants; long-term monitoring necessary. Least disruptive with existing operations. |
| ON3 On-Site Subtitle C Landfill | Eliminates long-term on-site worker contact, providing land use restrictions over landfill area are adhered to. Will generate dust and noise during construction. Reduces contaminant migration. | Uses standard construction practices. Complies with CAMU regulations. Long-term inspection and maintenance, including leachate collection and treatment required. Disruptive to existing operations. | $2.7 | X | | Complies with CAMU regulations. Requires long-term operation and maintenance of both cover and leachate-collection system. |
| ON4 Soil S/S Treatment Backfill | Reduces contaminant mobility and eliminates on-site worker exposure, assuming land use restrictions over entire site are adhered to. Will generate dust and noise during excavation. Shown to be effective by treatability tests. | Many vendors available; proven technology. Disruption to current operations. Will require long-term inspection and maintenance. | $11.0 | | X | Effective in reducing contaminant mobility characteristics. More costly than alternatives 5, 6, and 7; therefore, rejected. |
| ON5 In Situ S/S Treatment | Reduces contaminant mobility and eliminates on-site worker exposure, providing land use restrictions over entire site are adhered to. Will not generate as much excavation-associated nuisances. Not as controlled a process as ex situ S/S treatment. S/S treatment shown to be effective by treatability tests. | Monitoring effectiveness of S/S process should not be difficult due to shallow depths requiring treatment. Several vendors capable of performing in situ work. Disruptive to current operations. Existing buried utilities will interfere. Will require long-term inspection and maintenance. | $9.9 | X | | In situ S/S can be achieved using adapted construction equipment. May not be as effective as ex situ S/S treatment because of reduced control of process. Existing buried utilities will interfere with work. |

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Table 3-2
REMEDIAL ACTION ALTERNATIVE SCREENING—ON-SITE SOIL



| Alternative | Effectiveness | Implementability | Cost[1] | Screening Action | | Comments |
|---|---|---|---|---|---|---|
| | | | | Retain | Reject | |
| ON6 S/S Treatment and Subtitle C Landfill On-Site | Eliminates long-term on-site worker contact, providing land use restrictions over landfill area are adhered to. S/S treatment and landfill disposal essentially eliminates the potential for contaminant mobility. Will generate dust and noise during construction. Reduces contaminant migration. | Uses standard construction practices. Long-term inspection and maintenance including leachate collection and treatment required. Disruptive to existing operations. | $6.4 | X | | Requires long-term operation and maintenance of both cover and leachate- collection system. |
| ON7 On-Site Subtitle C and Subtitle D Landfills | Eliminates long-term on-site and off-site receptor contact if land-use restrictions on landfilled area are adhered to. Substantially reduces short-term impacts to nearby residents during remediation activities. | Uses standard construction practices. Long-term inspection and maintenance including leachate collection and treatment required. Disruptive to existing operations. | $3.6 | X | | Requires long-term operation and maintenance of both cover and leachate- collection system. |
| ON8 Soil S/S Treatment and Disposal at Off-Site TSDF[2] | Removes contaminant hazard from area. S/S effective during treatability study. Dust, noise, and increased traffic generated during excavation, treatment, and transport for disposal. Increases risk of traffic accidents and releases of waste materials. Long-term effectiveness does not rely on land use restrictions. | Many S/S vendors available. LDRs must be met. Dependent on acceptance by off-site disposal site. The most disruptive to current operations and residential community due to the combination of on-site treatment and truck traffic. | $14.9 | X | | Many S/S vendors available. S/S effective during treatability study. Most disruptive to local community because of on-site excavation/treatment and truck traffic. |

Notes:
[1]Capital costs are expressed in millions and have a targeted accuracy of +100 percent to -50 percent.
[2]Transport may also be performed by rail, however, costs for Alternatives 7 and 8 are based on truck transportation.

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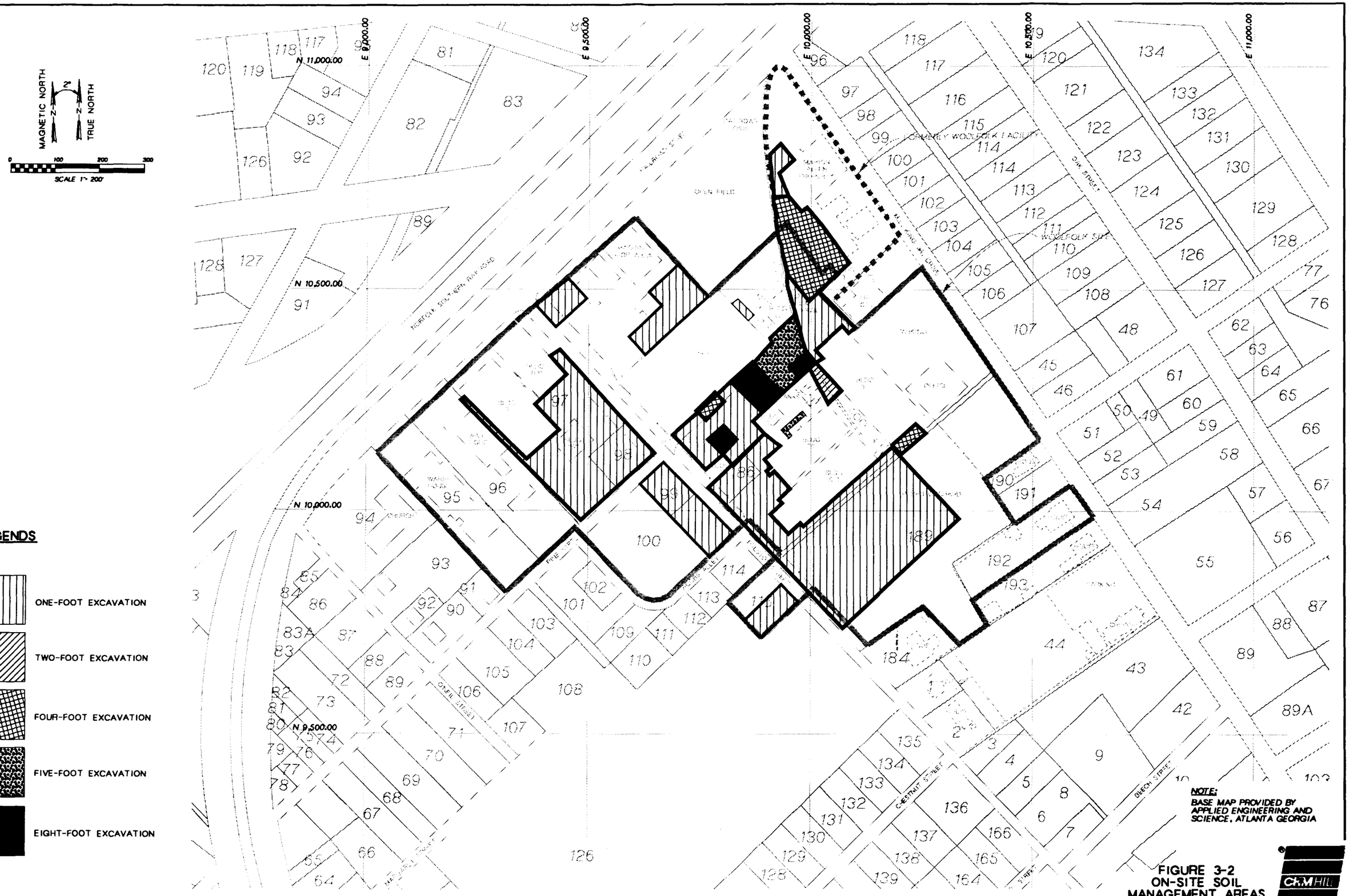


FIGURE 3-2
ON-SITE SOIL
MANAGEMENT AREAS

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### *Alternative ON2: Land Improvements for Industrial/Commercial Development*

This alternative leaves the contaminated soil in place and includes land improvements over the entire site. Land improvements include installation of new pavement and concrete, revegetation, and construction of stormwater controls such as regrading or storm sewers. Land-use restrictions would need to be put in place across the entire site as a means of protecting human health and the environment. Regular periodic inspections of the land improvements would need to be performed. The outcome of the inspections would determine the type of maintenance activities to be performed.

Because of the various land uses at the Woolfolk site, several different types of improvements are associated with this alternative. Concrete made with Portland cement would be placed in locations where heavy truck activity would take place. These locations are around buildings W, G, S, S-1, N, T, and the tank farm. The concrete would have a minimum strength of 3,000 pounds per square inch (psi) and would be air-entrained for outside use. The concrete would be placed over the existing subgrade. Where autos would be used, the areas would have about four inches of hydraulic asphalt placed over the existing subgrade. These areas would be constructed in existing paved areas and would require matching existing surface grades. The area south of Building W and the pecan orchard also would be paved with asphalt.

The matching of surface grades would require the removal of the existing concrete and asphalt. In order to construct the new pavement, approximately 3,300 cubic yards of debris would have to be removed and sampled to determine whether the material is hazardous according to the toxicity characteristic. The assumption is that the debris would not be hazardous. The debris would be disposed of in an off-site Subtitle D landfill. The majority of the trees in the pecan orchard would have to be removed to implement this remedy.

DRAFT

The types of cap proposed for this alternative are illustrated in Figure 3-3.

This on-site soil alternative was retained for further evaluation in Chapter 4.

### *Alternative ON3: On-Site Subtitle C landfill*

Alternative ON3 entails constructing an impermeable landfill meeting Subtitle C design standards, excavating all soil exceeding the target action and groundwater protection levels, and disposing of the soil in this landfill. Approximately 16,900 cubic yards would be excavated and disposed of in the landfill. About 1.4 acres for the landfill would be required. Land-use restrictions would be required in the landfill area to protect public health and the environment from a release of contaminated material in the future. The majority of the trees in the pecan orchard would have to be removed to implement this remedy. Paving and other land improvements would be performed over areas with arsenic contamination below 300 mg/kg but above 100 mg/kg.

A Subtitle C landfill would have a primary leachate-collection system; a synthetic primary liner; a secondary leachate-collection/leak-detection system; a composite bottom-liner system (a synthetic liner and compacted clay). The landfill cover will be constructed such that future expansion of the Woolfolk operations can be performed. An asphalt cap is proposed under this alternative. A cross section of a Subtitle C landfill liner is shown in Figure 3-4. Figure 3-5 illustrates a typical cross section of an asphalt cap. Other requirements include run-on and runoff controls, an environmental monitoring system, leachate-storage system, and O&M procedures. Because of the type of material to be disposed of, the quantity of leachate generated should be very small.

Contaminated soil and debris would not be treated before disposal. As long as the soil and debris are kept on the site and in areas of existing contamination, the CAMU regulations allow consolidation of remediation waste without triggering the LDRs. Because the primary contaminant in the soil is arsenic, which is relatively immobile, not treating the

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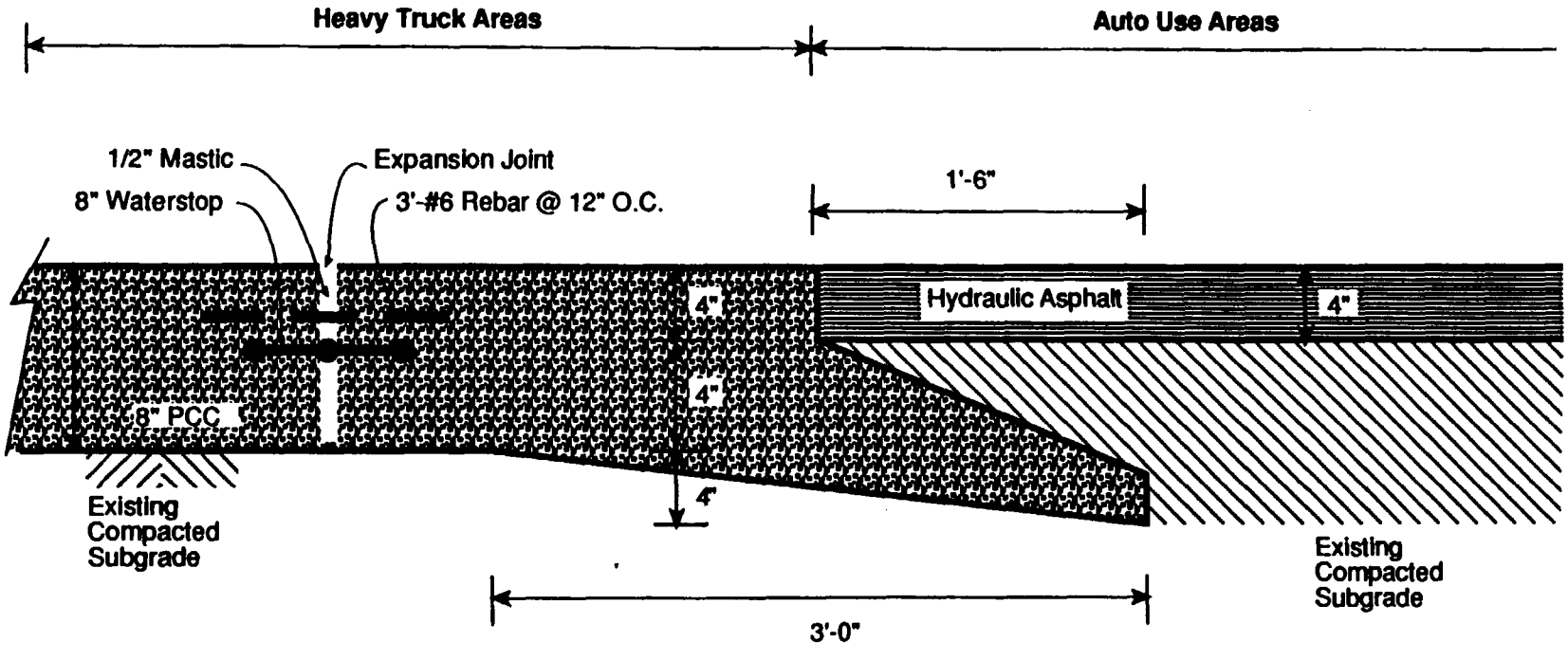


**Notes:**

1. PCC = Portland Cement Concrete, 3,000 psi minimum strength, air-entrained for outside use.
2. Hydraulic asphalt in accordance with Asphalt Institute.
3. Capping alternatives, to be constructed in existing paved areas, will require matching existing surface grades as closely as possible. Existing pavement will have to be removed.

**Figure 3-3**
CAP TYPES, PAVED VEHICULAR AREAS
FOR ALTERNATIVE ON2

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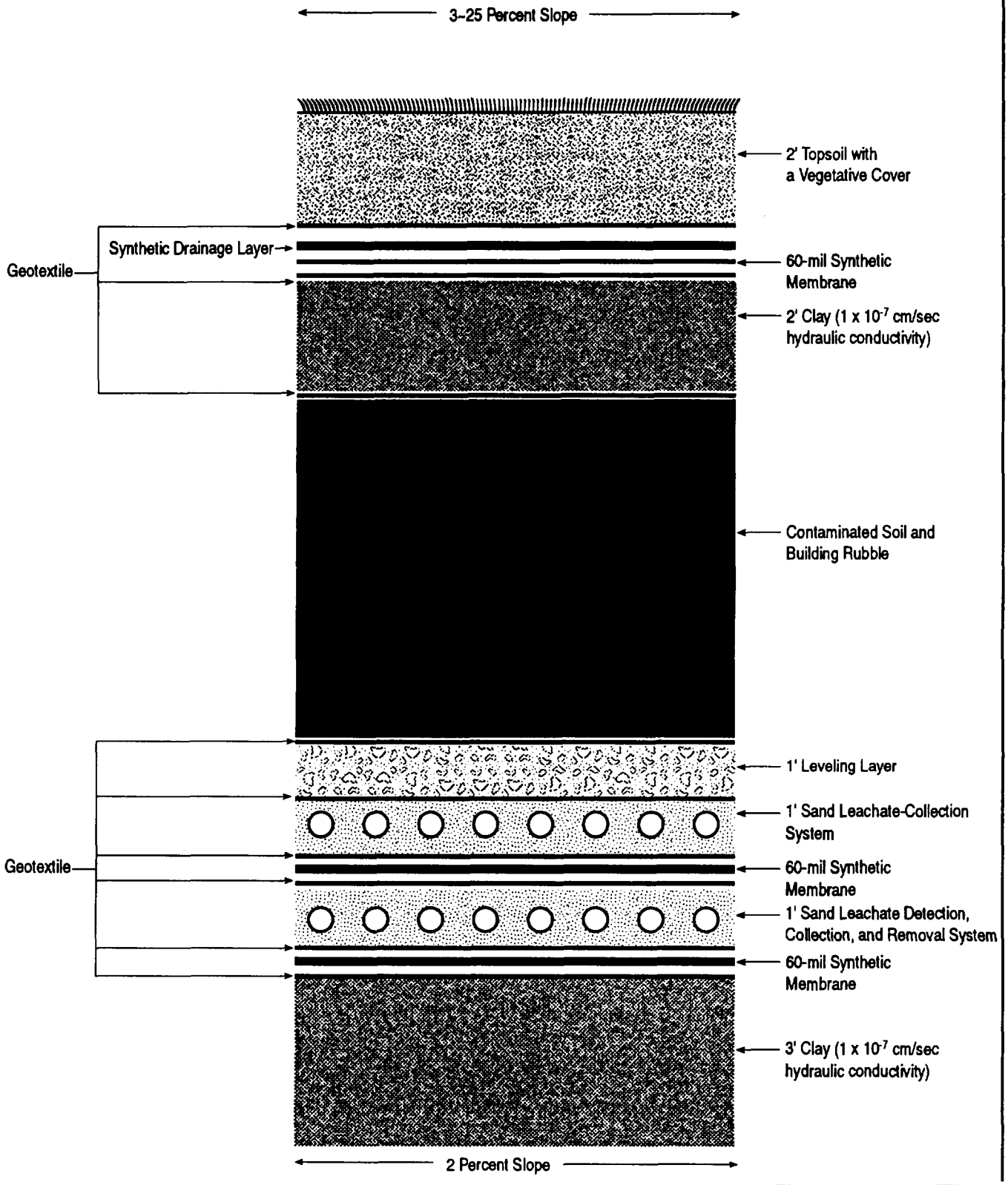


**Figure 3-4**
CROSS SECTION OF ON-SITE SUBTITLE C LANDFILL

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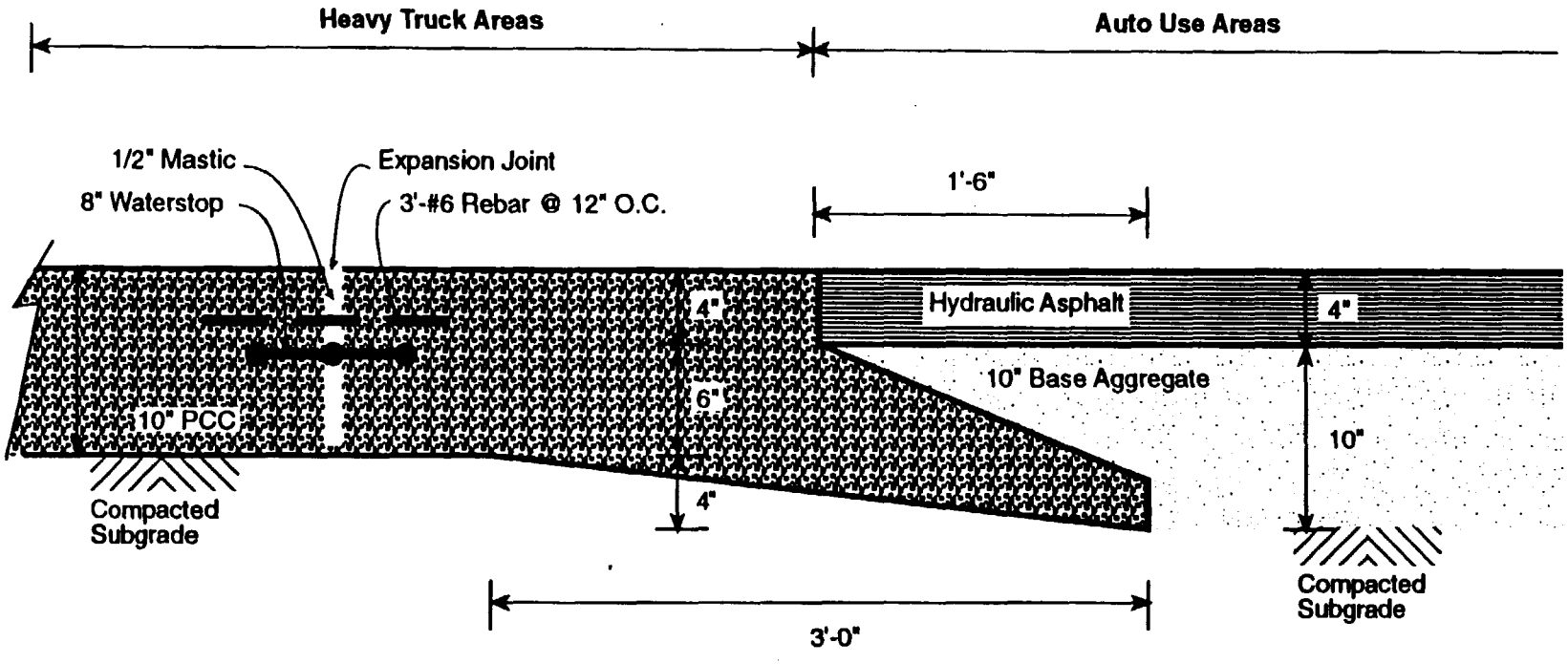


**Notes:**

1. PCC = Portland Cement Concrete, 3,000 psi minimum strength, air-entrained for outside use.
2. Hydraulic asphalt in accordance with Asphalt Institute.
3. Capping alternatives, to be constructed in existing paved areas, will require matching existing surface grades.

**Figure 3-5**
CAP TYPES, PAVED VEHICULAR AREAS
FOR ALTERNATIVES ON3 THROUGH ON8

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soil should not measurably reduce the effectiveness of this alternative. The leaching potential of the contaminated soil would be reduced considerably by disposing of it in a Subtitle C landfill.

Land improvements would be similar to Alternative ON2, however, the coverings would be slightly different, as illustrated in Figure 3-5. The differences are the result of the need to construct a subbase, because the existing soil is being excavated. This on-site soil alternative was retained for further consideration as described in Chapter 4.

### *Alternative ON4: S/S Treatment and Backfill*

This alternative requires excavating 16,900 cubic yards of contaminated soil and debris, treating the soil and debris by S/S, backfilling the treated material, and constructing land improvements similar to those required for Alternative ON3. The concrete and asphalt debris would be sampled to determine if treatment would be necessary. The assumption is that the debris would require treatment by S/S and then would be disposed of under the multimedia cap in the pecan orchard. Land-use restrictions must be put in place across the entire site as a means of protecting public health and the environment. Paving and other land improvements would be performed over areas with arsenic contamination below 300 mg/kg but above 100 mg/kg.

S/S treatment has been demonstrated through treatability testing as being effective on contaminated soil from the Woolfolk site. Organic contamination did not interfere with the S/S process. Treatability studies indicated that S/S using a reagent mixture of cement and Type F fly ash can reduce the mobility of the contaminants by more than 95 percent.

An S/S treatment system would be brought to the Woolfolk site. Contaminated soil would be excavated and brought to the unit for treatment. The reagents are mixed with the soil and treated material would be backfilled and allowed to cure.

DRAFT

All on-site soil with an arsenic concentration at or above 454 mg/kg would be treated because this concentration corresponds to the groundwater protection level (see Chapter 2). Soil and debris contaminated at or above a concentration of 500 mg/kg of arsenic could exceed the toxicity characteristic (TC) concentration of 5 mg/l of arsenic in the soil extract. An estimated 5,700 cubic yards of soil and debris may exceed the TC concentration. After treatment, the soil with a contaminant concentration above 500 mg/kg would no longer be considered a hazardous waste by characteristic.

Once treatment has been proven to meet the TC concentrations, land improvements similar to those for Alternative ON3 would be constructed to restore site conditions. Land improvements may include placing asphalt and concrete where similar material has been removed as part of the excavation. Multimedia caps would be constructed over the area of Building W and the pecan orchard. A multimedia cap consists of the components above the contaminated soil, as illustrated in Figure 3-4. Approximately 6,100 cubic yards of treated soil and debris excavated from the operating areas would be placed under the multimedia cap in the pecan orchard rather than back into the operating areas. This is necessary because of the 20 to 35 percent increase in volume that is typical of soil treated by the S/S process. Removing this excess volume would make it possible to pave the operating areas. Implementing this alternative would require the removal of most of the trees from the pecan orchard.

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This alternative was not retained for further analysis because it is not as cost-effective as Alternative ON5, ON6, and ON7.

### *Alternative ON5: In Situ S/S Treatment*

This alternative requires in situ S/S treatment followed by land improvements. In situ S/S treats contaminated soil without a significant amount of excavation. Approximately 9,400 cubic yards of soil and debris would have to be removed from areas used for vehicular traffic in order to place the new asphalt or concrete pavement. This soil and

debris would be treated and then placed in the pecan orchard under a multimedia cap. Land-use restrictions would be required throughout the site to protect public health and the environment.

Several vendors can perform in situ S/S, which requires modifying common construction equipment. In situ S/S can be performed at shallow depths (1 to 5 feet) by using a hollow-tine injector mounted on a tractor and pulled through the waste or by using a rotary tiller mounted on a tractor. The reagent is pumped through the equipment and mixed with the soil. The depth of remediation is limited by the tractor's size and traction. Soil requiring treatment to deeper depths likely would be treated by auger-mixing methods.

Treatability studies performed on Woolfolk-contaminated soil showed that the S/S technology is effective in reducing the mobility of contaminants by more than 95 percent. Because of the shallowness of the soil contamination, in situ treatment should be effective at the Woolfolk site. Land improvements similar to those in Alternative ON3 would be required to regrade treated areas and restore working areas. Similarly, the majority of the trees in the pecan orchard would have to be removed so this alternative can be implemented.

This alternative was retained for further evaluation as described in Chapter 4.

### *Alternative ON6: S/S Treatment, Subtitle C Landfill On Site*

This alternative is the same as Alternative ON3 (On-Site Subtitle C Landfill), except S/S treatment also is performed on soil that exceeds the TC concentration for arsenic. Soil and debris with contamination levels at or above 500 mg/kg would require treatment. The estimated volume of soil and debris requiring treatment is 5,700 cubic yards. A total of 18,300 cubic yards of material will be placed in the landfill.

This alternative was retained for further evaluation as described in Chapter 4.

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### *Alternative ON7: On-Site Subtitle C and D Landfills*

This alternative requires the construction of on-site Subtitle C and Subtitle D landfills. The Subtitle D landfill would be located at the existing cap. The Subtitle C landfill would be located in the Pecan Orchard.

Excavated soil that exceeds the TC concentration for arsenic would be disposed of in a hazardous waste landfill to further reduce the migration potential of the contaminants. An estimated 5,700 cubic yards of soil and debris may be placed there.

All the remaining soil that does not exceed any TC concentrations would be disposed of in a Subtitle D landfill. An estimated 11,200 cubic yards of soil would be disposed of in a Subtitle D landfill. Figure 3-6 illustrates a cross section of a Subtitle D landfill.

The remaining components of this alternative are the same as Alternative ON6.

Alternative ON7 was retained for further evaluation as described in Chapter 4.

### *Alternative ON8: S/S Treatment, Landfill Off-site*

This alternative is similar to Alternative ON6 (S/S treatment, Subtitle C landfill on site), except that the contaminated material would be transported off-site to a Subtitle C landfill for disposal. Approximately 16,900 cubic yards of soil would be transported off-site. This volume equates to about 25,400 tons and would require approximately 1,300 truck loads to transport all the material to an off-site disposal site. Paving and other land improvements would be performed over areas with arsenic contamination below 300 mg/kg but above 100 mg/kg. Land-use restrictions do not apply because all the waste material is removed from the site and disposed of at an off-site landfill.

This alternative was retained for further evaluation as described in Chapter 4.

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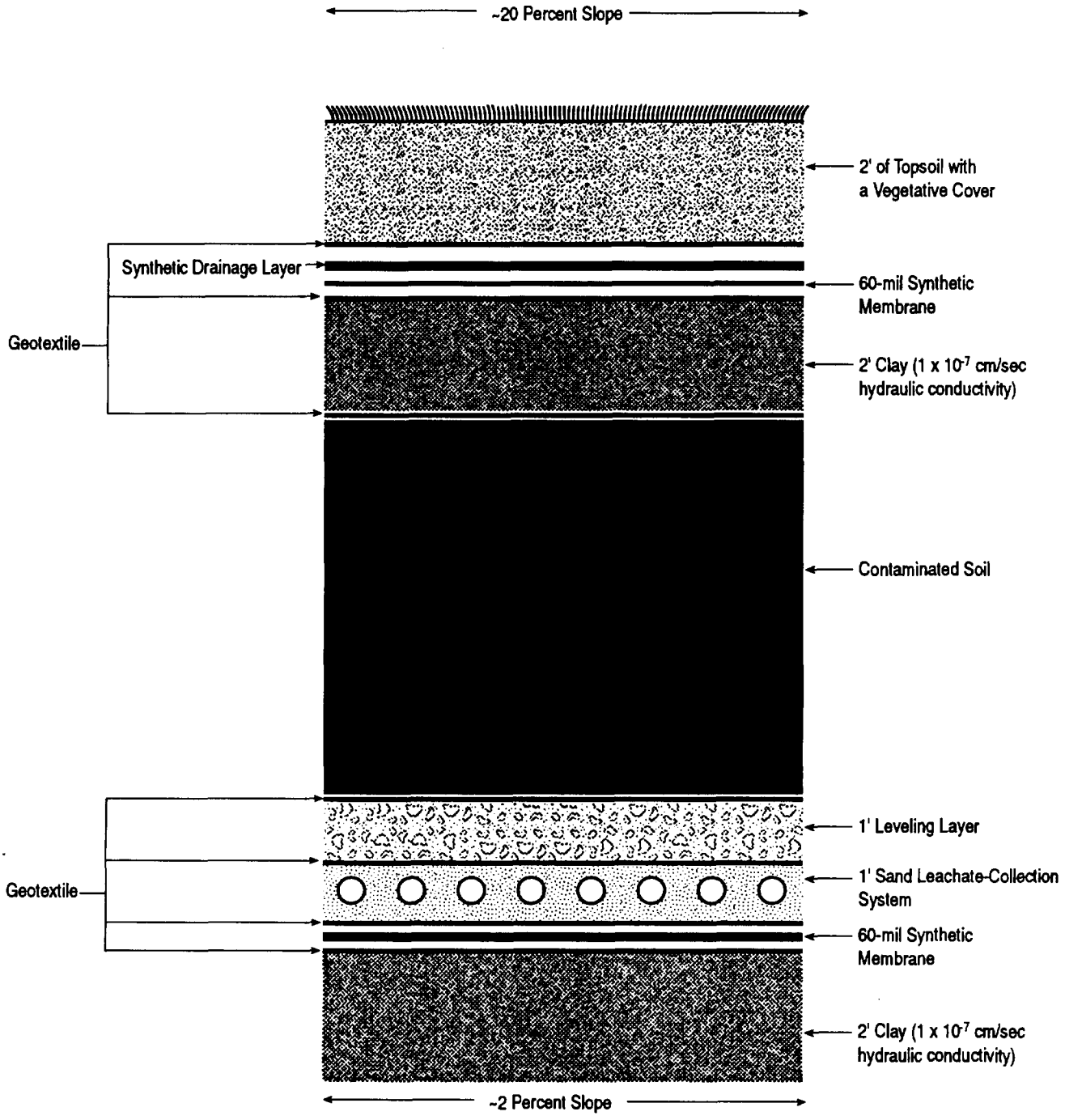


**Figure 3-6**
CROSS SECTION OF SUBTITLE D LANDFILL

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## *Alternative Screening: On-Site Soil*

A summary of the on-site soil alternative screening is presented in Table 3-2.

**Effectiveness**. Except for the no action alternative, all alternatives are effective at protecting public health and the environment from future long-term contact with contaminated soil. All alternatives except no action require varying amounts of excavation. In the short-term, remedial effectiveness may decrease in relation to the increase in the amount of excavation because contaminated dust would be generated. Alternatives ON2 and ON5 require the least amount of excavation. Alternative ON8 requires not only a significant amount of excavation but also transporting the material to an off-site disposal site. Therefore, in the short term, Alternative ON8 is the least effective alternative. For all alternatives requiring excavation, dust control measures must be used.

All the alternatives except no action include some form of containment such as asphalt and concrete covers, multimedia cap, or Subtitle C or Subtitle D landfills. Each containment technology is effective in varying degrees in preventing future inadvertent contact by current on-site workers or hypothetical on-site residents with contaminated materials and preventing leaching of contaminated materials as a result of stormwater runoff.

Alternatives ON4, ON5, ON6, and ON8 require S/S of contaminated soil. Stabilization/ solidification is effective in reducing the mobility of the inorganic contaminants, primarily arsenic, as well as some chlorinated pesticides. Alternatives ON6 and ON8 offer the additional benefit of long-term effectiveness because the treated material is disposed of in a Subtitle C landfill rather than being placed under a cap.

**Implementability**. The site is located in a residential and commercial area. All alternatives, to varying degrees, would create construction-related nuisances that must be managed properly to minimize their effect on the community. These nuisances include dust, noise, visual aesthetics, and construction traffic and would be difficult to avoid.

DRAFT

Alternatives ON6 and ON8 would require treatment of contaminated soil that exceeds the toxicity characteristic to meet LDR requirements. On the basis of the existing data, only arsenic would appear to exceed the toxicity characteristic level. The CAMU regulations apply to all other alternatives. The CAMU regulations allow for excavation and placement of contaminated materials within areas of contiguous contamination without triggering LDRs.

Local residents may oppose alternatives ON3, ON6, and ON7 because these alternatives involve constructing a landfill in their community.

All alternatives contain procedures that are standard construction practices or proven technologies on a full-scale basis. Because it proposes minimal soil management, Alternative ON2 is the least disruptive to current operations at the site in the short-term. Alternatives ON3, ON4, ON5, ON6, ON7, and ON8 would be the most disruptive to current operations in the short-term because they require excavation or treatment of a relatively large volume of soil. From a long-term perspective, land-use restrictions across the entire site must be implemented for Alternatives ON2, ON4, and ON5 because contaminated soil is either left in place, treated in place, or treated and backfilled.

The time required to implement the different alternatives depends on the volume of material to be treated and the type of remediation.

**Cost.** The screening cost estimates for the on-site soil alternatives are presented in Table 3-2. The accuracy of the estimates is between +100 percent to -50 percent. Detailed cost information is given in Appendix E.

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## Remedial Action Alternatives: Off-Site Soil (Commercial and Residential)

The remedial alternatives will address off-site contaminated soil on properties owned by CGC. It is assumed that CGC would use some of these properties as part of a redevelopment plan. The off-site soil action for arsenic has been set at 300 mg/kg for areas that will be paved and 100 mg/kg for areas that will not be paved. This action level will be used for the redevelopment block and any industrial or commercial properties. The residential arsenic action level is 30 mg/kg and applies to all non-commercial properties and properties that are not part of the redevelopment plan.

CGC has purchased and/or remediated several off-site properties. These properties are shown in Figure 3-7 and identified in Table 3-3. Based on the action level and future use of off-site properties, no remedial actions will be required. General improvements as part of the redevelopment plan will be sufficient in addressing any residual arsenic concentrations in the redevelopment block.

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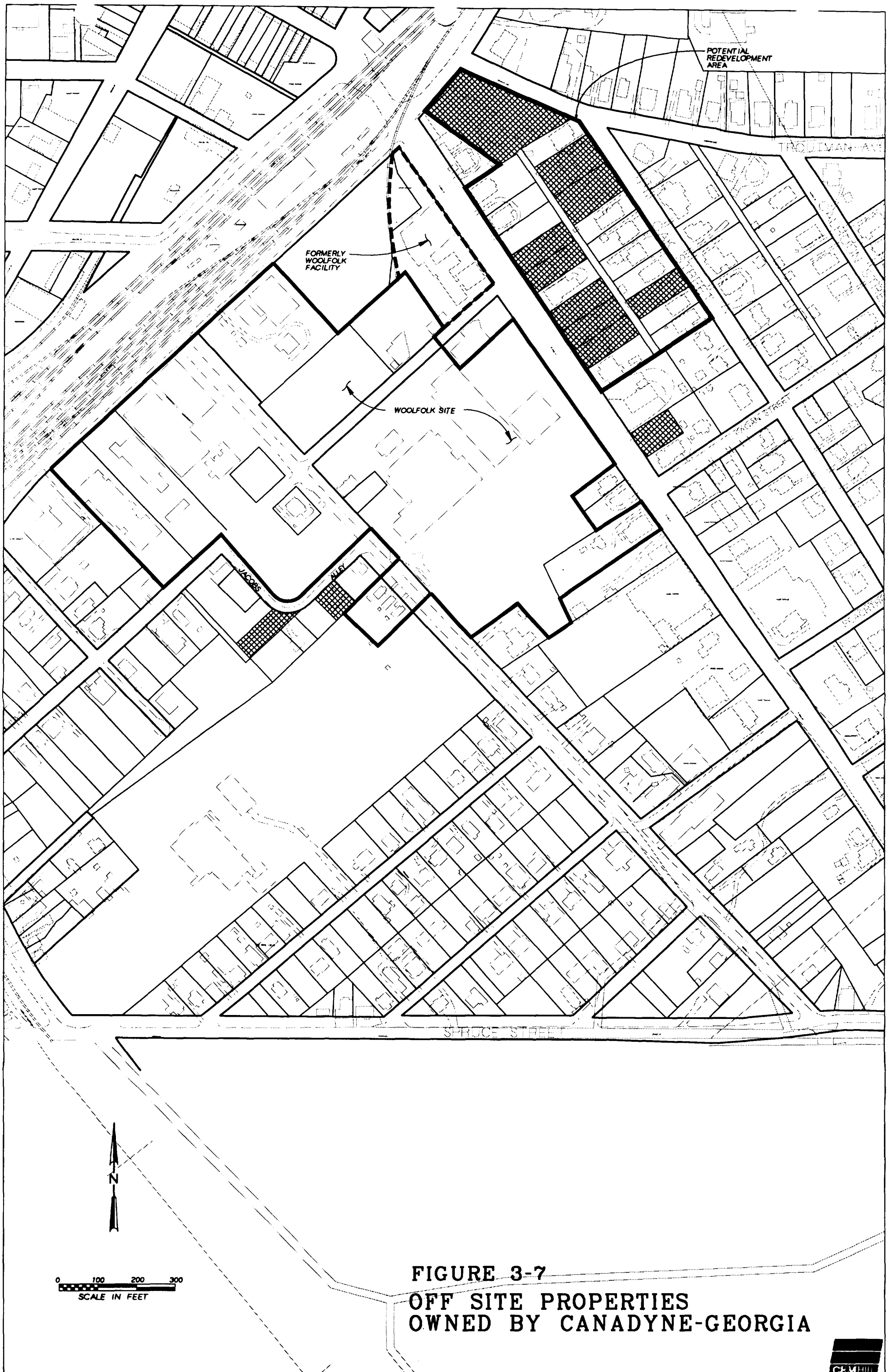


FIGURE 3-7
OFF SITE PROPERTIES
OWNED BY CANADYNE-GEORGIA

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| Table 3-3<br>SUMMARY OF OFF-SITE PROPERTY | | |
|---|---|---|
| **Address** | **Action Level (mg/kg)** | **Status** |
| Jacobs Alley (Lot 293) | 30 | to be remediated |
| 201 Oakland Heights* | 100 | below action level |
| 202 Oak St.* | 100 | below action level |
| 204 Oak St.* | 100 | below action level |
| 216 Oak St.* | 100 | below action level, if paved |
| 218 Oak St.* | 100 | below action level |
| 305 MLK Jr. Drive* | 100 | below action level |
| 307 MLK Jr. Drive* | 100 | below action level |
| 309 MLK Jr. Drive* | 100 | below action level |
| 311 MLK Jr. Drive* | 100 | below action level |
| 313 MLK Jr. Drive* | 100 | below action level |
| 315 MLK Jr. Drive* | 100 | below action level, if paved |
| 317 MLK Jr. Drive* | 100 | below action level, if paved |
| 319 MLK Jr. Drive* | 100 | below action level |
| 321 MLK Jr. Drive* | 100 | below action level |
| 323 MLK Jr. Drive | 100 | below action level, if converted to commercial use |
| 327 MLK Jr. Drive | 30 | below action level |
| Note: Status as of June 13, 1994<br>*Potential redevelopment area. | | |

DRAFT

## Remedial Action Alternatives: Existing Cap

Four remedial alternatives were developed for managing contaminated material under the existing cap at the site (Figure 3-8). These alternatives are summarized in Table 3-4. The discussion that follows presents the estimates of material quantities that were used in the alternatives evaluation.

### *Materials Quantity Estimates*

In 1986 and 1987, CGC performed demolition of the lead arsenic building and soil remediation in Area 1. The actions taken as part of the remediation are summarized in Chapter 1. AES characterized the area and identified high concentrations of arsenic and lead. This resulted in the actions taken in 1986 and 1987. The main objective of the remediation was the removal of soil with arsenic and lead contamination greater than 10,000 mg/kg. Soil with arsenic and lead concentration below this level was left in place and covered with the cap. As part of the remediation, 500 cubic yards of arsenic-contaminated rubble and 3,000 cubic yards of lime-sulfur sludge were placed under the cap. Based on preliminary sampling done prior to demolition and excavation in Area 1 and angle borings performed for the RI, an estimated 8,100 cubic yards of material would require management. This 8,100 cubic yards includes the rubble and lime-sulfur sludge. Appendix D presents the material quantity estimate.

### *Existing Cap Construction*

A summary and evaluation of the existing cap was prepared by Clean Sites, Inc., and submitted to EPA in October 1993. A copy of this evaluation is included in Appendix F.

The cap components consist of, from top to bottom, grass, 24 inches of topsoil, a filtering geotextile, 12 inches of granular drainage material, a 30 mil HDPE geomembrane, and 24 inches of clay. The cap finished grade and drainage layer have a minimum slope of

DRAFT

| Action or Technology | Alternatives | | | |
|---|---|---|---|---|
| Technology Type | CP1 No Action | CP2 Continued Operation and Monitoring | CP3 Excavation and On-Site Disposal | CP4 Excavation and Off-Site Disposal |
| No Action | • | | | |
| Groundwater Monitoring | | • | | |
| Evacuation | | | • | • |
| S/S Treatment | | | | • |
| On-Site Landfill | | | • | |
| Off-Site Disposal Facility | | | | • |

**Figure 3-8**
PRELIMINARY EXISTING CAP ALTERNATIVES

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**Table 3-4**
**REMEDIAL ACTION ALTERNATIVE SCREENING—EXISTING CAP**

| Alternative | Effectiveness | Implementability | Cost[1] | Screening Action | | Comments |
|---|---|---|---|---|---|---|
| | | | | Retain | Reject | |
| CP1 No Action | None | None | None | X | | Retained as baseline alternative; required by NCP. |
| CP2 Continued Operation & Monitoring | The existing cap is effective at diverting precipitation away from waste. Restrictions for work on or around cap are required. Monitoring will detect if contamination is migrating. | Easily implemented. Monitoring wells can be installed adjacent to cap. Cap is already constructed. | $0.2 | X | | Cap is already in place. Low probability for contaminant transport. |
| CP3 Excavation and On-Site Disposal | Places contamination in disposal cell with bottom liner. Much higher short-term risks compared to CP2. Does not remove contamination from site. | Uses standard construction practices. Long-term inspection and maintenance required. Disruptive to existing operations. Due to space limitations, cannot be implemented with all on-site soil alternatives. | $0.6[2] | X | | Disruptive to onsite operations and local community. High short-term risk. |
| CP4 Excavation and Off-Site Disposal | Removes contamination from site. Higher short-term risks than CP2 and CP3. Eliminates any long-term risk from waste at the site. | Uses standard construction practices. Requires landfill acceptance. Disruptive to operations and community due to truck traffic. | $11.2 | X | | Disruptive to onsite operations and local community. High short-term risk. |

[1]Capital costs are presented in millions of dollars and have a targeted accuracy of +100 percent to -50 percent.
[2]On-site landfill not included. Will be combined with larger alternative.

DRAFT

3 percent. The cap section, slope, and component thicknesses all comply with RCRA requirements. Table 3-5 summarizes the existing cap versus a RCRA cap.

**Table 3-5**
**EXISTING CAP LAYER COMPONENTS**

| Layer | RCRA Cap | Existing Site Cap |
|---|---|---|
| Top Layer | 24-inches<br>3-5% slopes<br>topsoil and vegetation | 24-inches<br>3% slopes<br>topsoil and grass |
| Drainage Layer | 12-inches<br>3% slope minimum<br>permeability > $1x10^{-2}$ cm/s | 12-inches<br>3% slope<br>permeability = $2.6x10^{-3}$ cm/s |
| Low Permeability Barrier Layer | 20-mil geomembrane<br>24-inches<br>permeability < $1x10^{-7}$ cm/s | 30-mil HDPE geomembrane<br>24-inches<br>permeability = $2.5 - 6.0x10^{-7}$ cm/s |

DRAFT

Hydrologic modeling of the cap indicates that 98.03 percent of precipitation evaporates or runs off the top of the cap. An additional 1.96 percent of precipitation exits through the drainage layer. The remaining 0.01 percent of precipitation percolates through the bottom layer of the cap. Of a total rainfall, 99.99 percent of the rain is prevented from infiltrating the contaminated materials under the cap. For an average rainfall of 47 inches per year or a total of 1.28 million gallons of water falling onto the cap, 37 gallons percolates through all of the layers in the cap. Appendix F contains the results of the hydrologic evaluation model.

The groundwater is approximately 35 to 40 feet below the top of the cap. According to the AES construction report the estimated extent of contamination is 10 to 20 feet above the water table.

Assuming the cap is not breached, there is a very low probability for contaminant transport. In addition, the OU1 (groundwater) remedy will have extraction wells located next to the capped area.

### *Alternative CP1: No Action*

The no action alternative, required by the NCP, is the baseline alternative with which the effectiveness of other alternatives would be compared. Under this alternative, no control or remedial action is done.

### *Alternative CP2: Continued Operation, Maintenance, and Monitoring*

This alternative leaves the cap in place and includes the installation of groundwater monitoring wells immediately downgradient of the cap. In addition, the OU1 remedy will have extraction wells next to the capped area.

Groundwater monitoring wells would be installed upgradient and downgradient from the cap. In the Surficial Aquifer, four new monitoring wells would be installed and existing well MW-2 would also be used. In the UC Water Table Aquifer, three new monitoring wells would be installed and existing wells MW-2P and MW-18 would be used. In the UC Confined Aquifer, three new monitoring wells would be installed and existing wells MW-2R and MW-3R would be used. These wells would be used to monitor the arsenic levels in the groundwater on a semi-annual basis. The OU1 remedy is also likely to dewater the Surficial Aquifer under the capped area. Extracted groundwater will be treated as part of the OU1 remedy. If there is an indication that the arsenic concentration is increasing, actions will be taken to remediate the cap area. The structural integrity of the cap will also be periodically monitored to ensure that if any cracks, breaks, or holes appear, they will be repaired.

DRAFT

### *Alternative CP3: Excavation and On-Site Disposal*

Alternative CP3 excavates the material under the existing cap and disposes it in an onsite landfill. The amount of material that would have to be managed is estimated to be 8,100 cubic yards. This material consists of soil, concrete rubble, and lime-sulfur sludge. Because of the large amount of material that would have to be managed, this alternative would be used in conjunction with Alternative ON7: On-Site Subtitle C and Subtitle D landfills.

The removal action left in place soil that was below 10,000 mg/kg of arsenic. The material excavated from underneath the cap would be handled as a hazardous waste due to its relatively high arsenic concentration compared to the rest of the site. This alternative also includes a predesign investigation of the cap and the material. Borings will be installed to provide lateral and vertical delineation of the material under the cap prior to designing the remediation.

This alternative was retained for further evaluation as described in Chapter 4.

### *Alternative CP4: Excavation and Off-site Disposal*

This alternative is similar to Alternative CP3, except that the excavated material will be treated and disposed of in an off-site Subtitle C landfill. Approximately 8,100 cubic yards of material would be transported off-site. The material will require S/S treatment because of its arsenic concentration. Treatment will add approximately 25% to the total volume, resulting in a post-treatment volume of 10,100 cubic yards. This volume equates to about 15,200 tons and would require approximately 800 truck loads to transport all the material to an off-site disposal site. On-site land-use restrictions do not apply because the waste material is removed from the site and disposed of at an off-site landfill.

This alternative was retained for further evaluation as described in Chapter 4.

DRAFT

## *Alternative Screening: Existing Cap*

A summary of the existing cap alternative screening is presented in Table 3-4.

**Effectiveness.** The alternatives provide relatively different levels of protection to public health and the environment. The existing cap was constructed to prevent infiltration of water through the waste. Alternative CP2 provides a low short-term risk because no intrusive construction is required and a relatively low long-term risk because there is a low potential for contaminant migration. Alternative CP3 provides a significantly higher short-term risk due to excavating the contaminated material above the action levels. The long-term risk of contaminant migration is not significantly lower than CP2. Alternative CP4 has the highest short-term risk due to excavating the contaminated material above the action levels and transporting this material through the community to a disposal site 300 miles from the site. The on-site long-term risk is eliminated because the waste is removed from the site.

In the July 26, 1992, *Federal Register* (p. 32314) EPA states that a properly designed and maintained can prevent the entry of liquids into the closed unit, and thus the formation and migration of leachate, for many years can minimize it thereafter in the absence of damage. For multilayered caps, such as the existing cap, EPA states the cap's synthetic membrane liner provides short-term prevention of infiltration and a clay layer to provide long-term minimization of precipitation infiltration and leachate generation. EPA believes that this will provide maximum short-term and long-term protection of human health and the environment.

**Implementability.** Alternative CP2 is easily implemented since only additional monitoring wells would have to be installed and continued operation and maintenance would be performed. Alternatives CP3 and CP4, to varying degrees, would create construction-related nuisances that must be managed properly to minimize their effect on the

DRAFT

community. These nuisances include dust, noise, visual aesthetics, and construction traffic. Alternatives CP3 and CP4 will generate high short-term risks relative to Alternative CP2.

Alternative CP4 would require treatment of contaminated soil that exceeds the toxicity characteristic to meet LDR requirements.

Local residents may oppose alternative CP3 because it requires constructing a landfill in their community. Alternative CP3 would have to be implemented in conjunction with Alternative ON7: On-Site Subtitle C and Subtitle D Landfills. This will have to be required due to the volume of the waste.

The time required to implement Alternative CP2 is very short as only monitoring wells need to be installed. Alternatives CP3 and CP4 would require several months to implement.

**Cost.** The screening cost estimates for the existing cap alternatives are presented in Table 3-4. The accuracy of the estimates is between +100 percent to -50 percent. Detailed cost information is given in Appendix E.

DRAFT

## Remedial Action Alternatives: Structures

Three remedial action alternatives were developed to manage contaminated structures on the site (Figure 3-9). The alternatives are summarized in Table 3-6. A discussion follows of the material quantities that were estimated and then used in evaluating the structure alternatives.

### *Material Quantities Estimate*

Building W at the Woolfolk site is contaminated. The remedial alternatives for this building include decontamination or demolition. A second structure, Building E, at Woolfolk was demolished, and the material has been secured at the site. Building W is an irregularly shaped wooden building from 2 to 3 stories high with a sloped roof. The building is covered with metal sheeting and wood, and rests on brick and cinder-block supports. The building is not contaminated with dioxin and the debris can therefore be disposed of in an on- or off-site landfill, with or without treatment depending on the contaminant concentrations in the wood. The assumption used for the cost estimates is that the debris would not be hazardous according to the toxicity characteristic. Therefore, the debris could be landfilled without treatment. The size of Building W was estimated as 75 feet by 75 feet from aerial photographs, and an average of 25 feet high. The estimated debris resulting from demolition of Building W was approximately 460 cubic yards.

Building E was a one-story wooden building with metal siding and a brick and cinder block foundation. The building was cleaned and then demolished. Some parts of the building are contaminated with dioxins; therefore, all the demolition debris cannot be landfilled. Non-dioxin contaminated debris was disposed of in an off-site landfill. The debris is being stored on the site in an enclosed container located next to the cap until an off-site treatment option is available.

DRAFT

| General Response Action | | Alternatives | | | |
|---|---|---|---|---|---|
| Technology Type | Amount | ST1 No Action | ST2 Decontamination, On-Site Storage, Disposal off Site | ST2 Demolition, On-Site Storage, Disposal with On-Site Soils | ST4 Demolition, On-Site Storage, Disposal Off Site |
| Demolition | 1 Building (Building W) | | | • | • |
| Decontaminate and Secure | 1 Building (Building W) | | • | | |
| Off-Site Disposal of Debris | 1 Building (Building W) | | | | • |
| On-Site Disposal of Debris | 1 Building (Building W) | | | • | |
| On-Site Storage of Dioxin Debris | 1 Building (Building E) | | • | • | • |

**Figure 3-9**
PRELIMINARY STRUCTURES ALTERNATIVES

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**Table 3-6**
**REMEDIAL ACTION ALTERNATIVE SCREENING—STRUCTURES**

| Alternative | Effectiveness | Implementability | Cost[1] | Screening Action | | Comments |
|---|---|---|---|---|---|---|
| | | | | Retain | Reject | |
| ST1 No Action | None | None | None | X | | Retain as baseline alternative; however, SARA mandates a reevaluation every 5 years. |
| ST2 Decontamination, On-Site Storage, Disposal Off Site | Reduces on-site worker exposure to contaminants. Also eliminates recontaminating portions of the site by continued building operations. Requires long-term maintenance of Building W. | Standard technologies relatively easy to implement. | $0.5 | | X | Satisfies remedial action objectives. Would require long-term maintenance of Building W. Not retained since Building W would not be demolished. |
| ST3 Demolition, On-Site Storage, Disposal With On-Site Soil[2] | Reduces on-site worker exposure to contaminants. Also eliminates recontaminating portions of the site by continued building operations. | Standard technologies, relatively easy to implement | $0.6 | X | | Satisfies remedial action objectives. |
| ST4 Demolition, On-Site Storage, Disposal Off Site[3] | Reduces on-site worker exposure to contaminants. Also eliminates recontaminating portions of the site by continued building operations. However, truck traffic is increased during removal activities. | Standard technologies, relatively easy to implement | $0.7 | X | | Satisfies remedial action objectives. Increased truck traffic will occur due to off-site disposal. |

Notes:
[1]Capital costs are presented in millions of dollars and have a targeted accuracy of +100 percent to -50 percent.
[2]The on-site disposal cost is included in the on-site soil costs.
[3]Transport of debris to off-site TSDF could be performed by rail, however, the cost of Alternative ST4 is based on truck transport.

DRAFT

Currently, there is one TSDF permitted to accept dioxin-contaminated waste. The TSDF is an incinerator which has feed limitations for arsenic and lead. The dioxin-contaminated debris has arsenic concentrations above the incinerator's permit feed limitation, therefore, the TSDF cannot accept the waste.

Soil beneath Building E was found to contain dioxin contamination. This soil was not excavated during demolition activities. Approximately 30 cubic yards of dioxin-contaminated soil would be excavated. This soil would be stored with the building debris until a suitable disposal facility is identified.

Appendix D presents the calculations used to estimate the volume of materials.

### *Alternative ST1: No Action*

The no action alternative, required by the NCP, is the baseline alternative with which the effectiveness of other alternatives would be compared. Under this alternative, no control or remedial action is done.

### *Alternative ST2: Decontamination, On-Site Storage, Disposal Off Site*

Alternative ST2 includes taking Building W out of operation and decontaminating it using technologies such as vacuuming and washing (if necessary). The waste generated would be disposed of in an off-site Subtitle C landfill. Building W would also be secured. This would include renovating the roof, windows, and other building components, as necessary.

The dioxin-contaminated debris from Building E would remain in the sea/land container and storage structure constructed during the removal action. This material would remain on site until an off-site incinerator is permitted to burn dioxin-contaminated materials with elevated concentration of arsenic and lead. The debris not contaminated by dioxin was

DRAFT

disposed of in an off-site Subtitle D landfill. Dioxin-contaminated soil would be excavated and placed in roll-off containers. The soil would be stored with the debris until an off-site disposal site that accepts the material is found.

This alternative was not retained for further evaluation in Chapter 4.

### *Alternative ST3: Demolition, On-Site Storage, Disposal with On-Site Soil*

Alternative ST3 includes the demolition of Building W. Building E dioxin-contaminated soil and debris would be managed the same as described in Alternative ST2. The debris from Building W would be managed with the on-site soil. The debris would be sampled to determine whether the material is hazardous according to toxicity characteristic.

This alternative was retained for further evaluation in Chapter 4.

### *Alternative ST4: Demolition, On-Site Storage, Disposal Off Site*

Alternative ST4 includes the same components as Alternative ST3 except that the demolition debris from Building W would be taken to an off-site Subtitle C or D landfill. The debris would be sampled to determine whether the material is hazardous according to toxicity characteristic. For the purpose of estimating cost, disposal in a Subtitle C landfill was assumed.

This alternative was retained for further evaluation in Chapter 4.

### *Alternative Screening: Structures*

A summary of the structures alternative screening is presented in Table 3-6.

DRAFT

**Effectiveness**. One objective of structures remediation is to prevent exposing on-site workers to contaminated materials present in the structures. Another objective is to prevent recontamination of on-site soil by continued operations in nonsalvageable buildings. Alternative ST1, no action, would not achieve either objective. Alternative ST2 includes taking Building W out of operation and decontaminating and securing it. These actions would prevent worker exposure to any contaminants. Alternatives ST3 and ST4 would remove on-site structures known to be contaminated and, therefore, prevent worker exposure to the contaminants. Alternatives ST2, ST3, and ST4, therefore, would effectively meet the remedial action objectives.

**Implementability**. Alternative ST1, no action, is easily implemented. Each alternative can be implemented, but would require precautions to minimize the amount of dust and contaminants spread during demolition. These precautions would be followed during the building preparation phase of the demolition. Such precautions include spraying and/or vacuuming surfaces to minimize dust, removing bulk contaminants, decontaminating and removing salvageable equipment, and removing utility hook-ups. The technologies required for demolition are well developed and are routinely employed by the construction industry.

Disposal of the Building E soil and debris is currently not possible. There is a site that is permitted to receive and treat dioxin-contaminated material. This incinerator, however, has limitations on the feed concentrations of other contaminants. The arsenic level in the samples exceed the incinerator's permitted feed concentration, therefore the site can not accept the waste.

**Cost**. The estimated cost for each alternative is presented in Table 3-6.

DRAFT

## Remedial Action Alternatives: Stormwater Sewer

Three remedial alternatives were developed for the stormwater sewer running under the site (Figure 3-10). These alternatives are summarized in Table 3-7. Figure 3-11 shows the location of the stormwater system.

### *Alternative SW1: No Action*

The no action alternative serves as a baseline for evaluating the effectiveness and implementability of the remedial alternatives. The no action alternative, required by the NCP, involves no control or remedial technologies.

### *Alternative SW2: Decontaminated Stormwater System*

This alternative is designed to remove all sediment, both on- and off-site, from the stormwater sewer. Decontamination is a one-time procedure that removes all sediment from the stormwater system. Once the sediments have been removed, they would be analyzed to determine the proper disposal procedure.

There would be an initial video inspection of the stormwater system to determine the condition of the pipe and the extent of sediment and debris in the system. The inspection would identify potential problems in the pipe and locations where system repairs are required.

The chosen decontamination method is jetting followed by vacuuming. A truck mounted with jetting and vacuum equipment is required. A hose with the jetting nozzle is inserted upgradient in the line through a catch basin or manhole. The vacuum hose is dropped through the entry point, and water is pumped through the hose at approximately 125 gallons per minute. The jetting line is pulled downstream through the pipe, washing out any sediment.

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| Action or Technology | Alternatives | | |
|---|---|---|---|
| | SW1 No Action | SW2 Decontaminate Stormwater Sewer | SW3 On-Site Abandonment and Replacement |
| No Action | • | | |
| Jetting with Vacuming | | •[1] | •[2] |
| Abandonment of On-Site Stormwater Sewer and New Stormwater Sewer Installation | | | • |

**Note:**

[1] Both on and off site

[2] Off site only

**Figure 3-10**
PRELIMINARY STORMWATER SEWER ALTERNATIVES

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**Table 3-7**
**REMEDIAL ACTION ALTERNATIVE SCREENING—STORMWATER SEWER SYSTEM**

| Alternative | Effectiveness | Implementability | Cost[1] | Screening Action | | Comments |
|---|---|---|---|---|---|---|
| | | | | Retain | Reject | |
| SW1 No Action | None | None | None | X | | Serves as a baseline alternative. |
| SW2 Decontaminate Storm-Sewer (Jetting with Vacuuming) | Removes all sediments at one time. Easily controlled. Provides protection to human health and environment by removing sediments. | Easily implemented. Standard construction practices used. | $0.2 | X | | Effective method of removing contamination from storm sewer. |
| SW3 Abandon On-Site Existing Line and Install New Storm Sewer. Decontaminate Off-Site Storm Sewer. | Contains and binds up sediment in grout. New storm sewer will provide better drainage for area. Would eliminate the need to maintain storm-water sewer located under contaminated areas of the site. | Easily implemented. Standard construction practices used. Would require excavation through contaminated soil during installation. May be dependent on chosen on-site alternative. | $0.6 | | X | Would eliminate the need to maintain stormwater sewer located under contaminated areas of the site. Would require excavation through contaminated soil during installation. |

[1]Capital costs are presented in millions of dollars and have a targeted accuracy of +100 percent to -50 percent.

WDCR852/020.WP5/4

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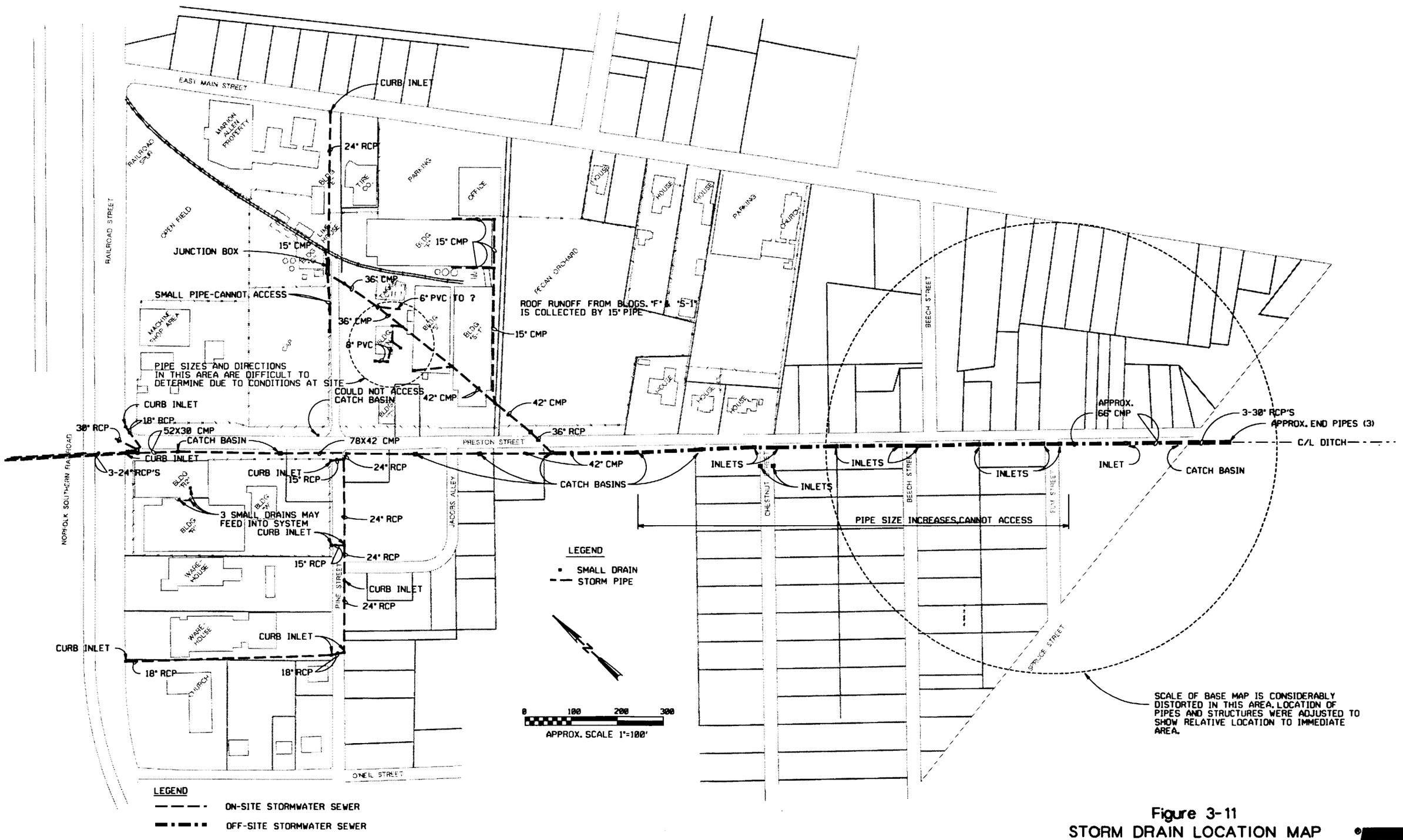


Figure 3-11
STORM DRAIN LOCATION MAP
WOOLFOLK CHEMICAL SITE
FT. VALLEY, GA.

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OVERLAY SCREEN
PROJ/D
FILE
SAE3573.A1

The vacuum hose pumps the sediment and water from the pipe into a tank mounted on the truck. The water and solids would be pumped into an on-site tank to allow the solids to settle. The water and sediment would be analyzed to determine the proper disposal method. Potential water disposal options would be the local POTW or a TSDF permitted under RCRA, depending upon the results of the analyses. The sediment would be managed with the on-site soil if appropriate. If the on-site sediment cannot be treated with the on-site soil, then it would be disposed of off-site in a Subtitle D landfill, as appropriate.

Jetting equipment can process 400 to 500 feet of pipe at one location. A daily production rate of 800 to 1,000 feet of pipe can be expected if the level of sediment is less than a third of the pipe diameter. The jetting equipment uses 7,000 to 10,000 gallons of water per day. The major system requirements are a supply of water and a location for storing the solids.

### *Alternative SW3: Abandonment and Replacement*

This alternative requires abandoning the stormwater pipe that runs under the site and constructing a new stormwater system. Abandonment would prevent further migration and stormwater contact with sediments (if they exist) from the site. The system would be abandoned by filling the pipe with concrete, thus containing any sediment present in the pipe. A new on-site stormwater system would be constructed and tied into existing pipes upgradient and downgradient of the site. The new system may require excavation through contaminated soil during installation. The new line would run along Preston Street on the west side of the site.

Pipe abandonment would be carried out by pumping cement grout into the pipe. Approximately 760 cubic yards of cement grout would be required to fill all of the on-site stormwater system piping.

The off-site part of the stormwater sewer system would be addressed as described in Alternative SW2. This alternative was not retained for further evaluation in Chapter 4.

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## *Alternative Screening: Stormwater Sewer*

A summary of the stormwater screening is presented in Table 3-7.

**Effectiveness.** Both Alternatives SW2 and SW3 are effective in meeting the remedial action objectives. The selection of either alternative is somewhat dependent on the on-site soil alternative selected. If the on-site soil is not consolidated, then Alternative SW3 would have a higher long-term effectiveness, because the stormwater system would be taken out of service in areas of soil contamination. This, in turn, would eliminate the need to maintain the system and the possibility of workers being exposed to contaminated materials on the site. However, installation of a new system would require excavation through contaminated soil. If the on-site contaminated soil is consolidated or removed, then the existing stormwater system would be surrounded by clean fill, and maintenance would not pose a risk.

Alternative SW1, no action, is not effective and is retained as a baseline alternative.

**Implementability.** Alternatives SW2 and SW3 are easily implemented. Video monitoring of the stormwater system would reduce the uncertainties that could be encountered when abandoning and/or cleaning the system. Alternative SW3 may be more difficult to implement depending on the chosen on-site alternative.

**Cost.** The estimated cost for each alternative is presented in Table 3-7.

WDCR852/021.WP5

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## Chapter 4

# Detailed Analysis of Site-Wide Remedial Alternatives

## Introduction

The detailed analysis of the remedial alternatives provides the information required to select the remedy for the Woolfolk site. Alternatives that passed the screening as detailed in Chapter 3 have been combined and developed into site-wide remedies. Each alternative contained in this chapter has been created to address potential threats posed by on-site soil, contaminated material under the existing cap, structures, and the stormwater system at the Woolfolk site. All alternatives are evaluated against nine criteria as defined in the NCP. The first seven criteria are addressed in this FS. The last two criteria will be addressed by EPA in the ROD. The nine criteria are:

- Protection of human health and environment
- Compliance with ARARs
- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, and volume
- Short-term effectiveness
- Implementability
- Cost
- State acceptance
- Community acceptance

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## Evaluation Criteria

The detailed alternative analysis is the means for assembling and evaluating technical and policy considerations to develop the rationale for selecting a remedy. The following discussions define and detail each of the nine criteria.

### Protection of Human Health and Environment

This evaluation criterion is an assessment of whether each site-wide alternative achieves and maintains adequate protection of human health and the environment. The overall appraisal of protection draws on the assessments conducted under other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs. Another consideration is the statutory preference for onsite remedial actions.

### Compliance with ARARs

This evaluation criterion is used to determine whether an alternative would meet all federal, state, and local ARARs that have been previously identified. Significant ARARs would be identified for each alternative, and descriptions on how they are met would be given. When an ARAR is not met, the basis for justifying one of the six waivers allowed under CERCLA would be discussed. A discussion of the compliance of each alternative with chemical-, location-, and action-specific ARARs is included.

### Long-Term Effectiveness and Permanence

Under this criterion the results of a remedial action alternative are evaluated in terms of the risk remaining at the site after response objectives have been met. The primary focus of this evaluation is the extent and effectiveness of the actions or controls that may be required to manage the risk posed by treatment residuals or untreated wastes. Factors to

DRAFT

be considered and addressed are magnitude of residual risk, adequacy of controls, and reliability of controls. Magnitude of residual risk is the assessment of the risk remaining from untreated waste or treatment residuals after remediation. Adequacy and reliability of controls is the evaluation of the controls that can be used to manage treatment residuals or untreated wastes that remain at the site. The evaluation may include an assessment of containment systems and institutional controls to determine whether they are sufficient to ensure that any exposure to human and environmental receptors is within protective levels.

## Reduction of Toxicity, Mobility, and Volume

This evaluation criterion addresses the statutory preference for selecting remedial actions that, as their principal element, use technologies that permanently treat and significantly reduce the toxicity, mobility, or volume of the hazardous substances. This preference is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible reduction of contaminant mobility, or reduction of total volume of contaminated media. When evaluating this criterion, an assessment is made as to whether treatment is used to reduce principal threats, including the extent to which toxicity, mobility, or volume are reduced either separately or in combination with one another. Factors that would be focused on include:

- Treatment processes employed by the remedy
- Amount of hazardous materials that would be treated
- Degree of expected reduction in toxicity, mobility, or volume measured as a percentage of reduction
- Degree to which the treatment would be irreversible

DRAFT

- Type and quantity of treatment residuals that would remain following treatment

- Whether the alternative would satisfy the statutory preference for treatment as a principal element

## Short-Term Effectiveness

This evaluation criterion addresses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Alternatives would be evaluated with respect to their effects on human health and the environment during implementation of the remedial action. The following factors would be addressed for each alternative:

- Protection of the community during remedial actions
- Protection of workers during remedial actions
- Environmental impacts during remedial actions
- Time until remedial action objectives are achieved

Short-term risks also were calculated for each alternative. A description of how these risks were calculated is presented in Appendix G.

## Implementability

The implementability criterion addresses the technical and administrative feasibility of executing an alternative and the availability of various services and materials required during its implementation. Analysis under this criterion includes technical feasibility, administrative feasibility, and availability of services and materials. Technical feasibility includes construction, operation, reliability of technology, ease of undertaking additional remedial action, and monitoring. Administrative feasibility refers to the activities needed

DRAFT

to coordinate with other offices and agencies (e.g., local permits). Availability of services and materials includes availability of adequate off-site treatment, storage capacity, and disposal services; necessary equipment and specialists; services and materials; and prospective technologies.

## Cost

For the detailed cost analysis of alternatives, the expenditures required to complete each measure are estimated in terms of both capital and annual O&M costs. Using these values, a present-worth calculation for each alternative then can be made for comparison.

Capital costs consist of direct and indirect costs. Direct costs include the cost of construction, equipment, land and site development, treatment, transportation, and disposal. Indirect costs include engineering expenses, license or permit costs, and contingency allowances.

Annual O&M costs are the post-construction costs required to ensure the continued effectiveness of the remedial action. Components of annual O&M cost include the cost of operating labor, maintenance materials and labor, auxiliary materials and energy, residue disposal, purchased services, administration, insurance, taxes, licensing, maintenance reserve and contingency funds, rehabilitation, monitoring, and periodic site reviews.

Expenditures that occur over different time periods were analyzed using present worth, which discounts all future costs to a common base year. Present-worth analysis allows the cost of remedial action alternatives to be compared on the basis of a single figure representing the amount of money that, if invested in the base year and disbursed as needed, would be sufficient to cover all costs associated with the life of the remedial project. Assumptions associated with the present-worth calculations include a discount rate of 7 percent before taxes and after inflation, cost estimates in the planning years in constant

DRAFT

dollars, and a period of performance that would vary depending on the activity, but would not exceed 30 years.

The cost estimates for this section are provided to an accuracy of +50 percent to -30 percent. The alternative cost estimates are in 1994 dollars and based on conceptual design from information available at the time of this study. The actual cost of the project would depend on the final scope and design of the selected remedial action, the schedule of implementation, competitive market conditions, and other variables. Most of these factors are not expected to affect the relative cost differences between alternatives.

## State Acceptance

This assessment evaluates the technical and administrative issues and concerns the state may have regarding each of the alternatives. This criterion is not discussed in this report, but would be addressed in the ROD once comments on the RI/FS have been received.

## Community Acceptance

This assessment evaluates the issues and concerns the public may have regarding each of the alternatives. As with state acceptance, this criterion is not discussed in this report, but would be addressed in the ROD once comments on the RI/FS reports have been received.

# Analysis of Site-Wide Alternatives

In Chapter 3, media-specific alternatives are evaluated on the basis of effectiveness, implementability, and cost. The environmental media are the on-site soil, material under the existing cap, structures, and the stormwater system. The alternatives that are specific to the environmental media have been combined to form all-encompassing site-wide alternatives. The site-wide alternatives have been developed to meet the remedial action

DRAFT

objectives. Seven site-wide alternatives, including the No Action Alternative, were developed and evaluated in this chapter. The primary distinguishing component between the alternatives is how the on-site soil would be managed. Also, management of the material under the existing cap differs for several alternatives. Each of the alternative titles correspond to the on-site soil component. The alternatives are:

- Alternative 1 - No Action
- Alternative 2 - Land Improvements for Commercial/Industrial Development
- Alternative 3 - On-Site Subtitle C Landfill
- Alternative 4 - S/S Treatment of Hazardous Soil and On-Site Subtitle C Landfill
- Alternative 5 - In Situ S/S Treatment
- Alternative 6 - On-Site Subtitle C and D Landfills
- Alternative 7 - S/S Treatment of Hazardous Soil and Off-Site Landfills

The major components of each of the site-wide alternatives are presented in Figure 4-1. Each alternative will be described and evaluated on the basis of the seven criteria previously discussed. A summary of this evaluation is presented in Table 4-1.

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| Action or Technology | Alternatives | | | | | | |
|---|---|---|---|---|---|---|---|
| | Alternative 1—No action | Alternative 2—Land improvements for Commercial/Industrial Development | Alternative 3—On-site Subtitle C landfill | Alternative 4—S/S treatment of hazardous soil, and on-site Subtitle C landfill | Alternative 5—In situ S/S treatment | Alternative 6—On-site Subtitle C and D landfills | Alternative 7—S/S treatment of hazardous soil, and off-site Subtitle C and D landfills |
| **On-Site Soil** | | | | | | | |
| No action | • | | | | | | |
| Land improvements | | • | • | • | • | • | • |
| Excavation | | | • | • | • | • | • |
| Subtitle C landfill | | | • | • | | • | |
| Subtitle D landfill | | | | | • | • | |
| S/S treatment | | | | • | • | | • |
| In situ S/S treatment | | | | | • | | |
| Dispose in off-site Subtitle C landfill | | | | | | | • |
| **Existing Cap** | | | | | | | |
| No action | • | | | | | | |
| Continued operation and monitoring | | • | • | • | • | | |
| Excavation | | | | | | • | • |
| S/S Treatment | | | | | | | • |
| Dispose of in on-site Subtitle C landfill | | | | | | • | |
| Dispose of in off-site Subtitle C landfill | | | | | | | • |
| **Structures** | | | | | | | |
| No action | • | | | | | | |
| Excavate dioxin contaminated soil | | | • | • | | • | • |
| Dioxin debris and soil storage facility | | • | • | • | • | • | • |
| Demolish Building W | | • | • | • | • | • | • |
| Dispose of building debris on-site | | | • | • | • | • | |
| Dispose of building debris off-site | | • | | | | | • |
| **Stormwater System** | | | | | | | |
| No action | • | | | | | | |
| TV inspection | | • | • | • | • | • | • |
| Decontaminate on- and off-site line | | • | • | • | • | • | • |
| Sediment disposal on site | | • | • | • | • | • | |
| Sediment disposal off site | | | | | | | • |

**Figure 4-1**
COMPONENTS OF FACILITY-WIDE ALTERNATIVES

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**Table 4-1**
**SUMMARY OF ALTERNATIVES EVALUATION**



| Evaluation Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/Industrial Development | Alternative 3 On-site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-site Hazardous and Subtitle D Landfills | Alternative 7 S/S Treatment of Hazardous Soil and Off-site Landfills |
|---|---|---|---|---|---|---|---|
| Protection of Human Health and Environment | No protection from present contamination levels. | Addresses each of the remedial action objectives. Protective of human health and environment if the alternative components are designed, constructed, operated, and maintained properly. | See Alternative 2. | See Alternative 2. Short-term risks exceed long-term risks. | See Alternative 2. Short-term risks exceed long-term risks. | See Alternative 2. Short-term risks exceed long-term risks. | Contaminated soil above target action levels is removed from the site eliminating long-term risk of exposure. However, a significant amount of truck traffic will occur, increasing the potential for accidents, which is the highest short-term risk. Does not meet statutory preference for onsite actions. Short-term risks outside EPA acceptable range. |
| Compliance with ARARs | Does not meet any chemical-specific ARARs. Action-specific ARARs not applicable since no action occurs. | Chemical-specific ARARs are complied with. | See Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. | All ARARs would be complied with. |
| Long-Term Effectiveness and Permanence | Long-term risk remains at current levels or would worsen. | Long-term effectiveness and permanence would achieve the remediation objectives if the alternative components are designed, constructed, operated, and maintained properly. | See Alternative 2. If cap should fail to some degree, added protection is provided by a leachate collection and liner system. | See Alternative 3. In addition, contaminant migration potential is reduced since soil determined to be hazardous is treated. | See Alternative 2. In addition, contaminant migration potential is reduced since all soil at or above target action levels is treated. | See Alternative 3. | Soil component of alternative is permanent since soil at or above target action levels is removed from the site. All other alternative components are the same as Alternative 2. |

**Table 4-1**
**SUMMARY OF ALTERNATIVES EVALUATION**



| Evaluation Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/Industrial Development | Alternative 3 On-site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-site Hazardous and Subtitle D Landfills | Alternative 7 S/S Treatment of Hazardous Soil and Off-site Landfills |
|---|---|---|---|---|---|---|---|
| Reduction of Toxicity, Mobility, and Volume | None. | All soil at or above target action levels would be covered. This reduces migration potential of soil contaminants.<br><br>Toxicity and volume remain unchanged.<br><br>Existing cap is preventing substantial infiltration of water through highly contaminated material. | Migration potential of soil contaminants is reduced by disposal in a Subtitle C Landfill.<br><br>Existing cap remains in place (see Alternative 2).<br><br>Toxicity and volume remain unchanged. | Same as Alternative 3, except 5,700 $yd^3$ of hazardous soil and debris would undergo S/S treatment, reducing contaminant mobility; however, volume increases due to S/S treatment and toxicity remains unchanged. Existing cap remains in place (see Alternative 2). | Same as Alternative 2, except 16,000 $yd^3$ of contaminated soil at or above target action levels would undergo S/S treatment, reducing contaminant mobility; however, volume increases due to S/S treatment and toxicity remains unchanged. Existing cap remains in place (see Alternative 2). | Same as Alternative 3, except existing cap is excavated and material (8,1000 $yd^3$) is placed with the 5,700 $yd^3$ in Subtitle C Landfill. | All hazardous material is treated and disposed of offsite. All other contaminated material is disposed of offsite. |
| Short-Term Effectiveness | Short-term risk remains at current levels. | Temporary increase in fugitive dust generation during remediation activities. On-site subchronic hazard index equals 2.7. Excess cancer risk equals $5x10^{-6}$.<br><br>Estimated number of vehicular accidents based on required number of truck trips is 0.3. Estimated number of vehicular accidents involving injuries is 0.1. | On-site subchronic hazard index equals 4.3. Excess cancer risk equals $2x10^{-5}$. Transport of contaminated soil off-site, which increases the likelihood of accidents.<br><br>Estimated number vehicular accidents is 1.3. Estimated number of vehicular accidents involving injuries is 0.6. | On-site risks Same as Alternative 3, except cancer risk equals $3x10^{-5}$.<br><br>Estimated number of vehicular accidents is 1.7. Estimated number of vehicular accidents involving injuries is 0.8.<br><br>Short-term risks exceed long-term risks. | On-site subchronic hazard index equals 4.3. Excess cancer risk equals $4x10^{-5}$.<br><br>Estimated number of vehicular accidents is 0.6. Estimated number of vehicular accidents involving injuries is 0.3.<br><br>Short-term risks exceed long-term risks. | Risks to local community would essentially be eliminated since this property will be purchased.<br><br>On-site subchronic hazard index equals 5.5. Excess cancer risk equals $8x10^{-5}$. Estimated number of vehicular accidents is 2.2. Estimated number of vehicular accidents involving injuries is 1.<br><br>Short-term risks exceed long-term risks. | Most disruptive is the short-term. About 2,800 truckloads of contaminated material would be transported off-site substantially, increasing the potential for accidents. Subchronic hazard index equals 6.6. Excess cancer risk equals $2x10^{-4}$.<br><br>Short-term risk is outside EPA's acceptable range.<br><br>Estimated number of vehicular accidents is 5. Estimated number of vehicular accidents involving injuries is 2.3. |

**Table 4-1**
**SUMMARY OF ALTERNATIVES EVALUATION**



| Evaluation Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/Industrial Development | Alternative 3 On-site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-site Hazardous and Subtitle D Landfills | Alternative 7 S/S Treatment of Hazardous Soil and Off-site Landfills |
|---|---|---|---|---|---|---|---|
| Implementability | Not applicable. | Routine construction activities.<br><br>Refer to compliance with ARARs criterion. | Routine construction activities.<br><br>Allows for future expansion of site operations.<br><br>Refer to compliance with ARARs criterion. | Routine construction activities. S/S treatment performed by several contractors.<br><br>Refer to compliance with ARARs criterion. | In situ S/S relatively standard treatment technology. Several contractors available to treat soil. All other alternative components will include routine construction activities.<br><br>Refer to compliance with ARARs criterion. | Routine construction activities.<br><br>Refer to compliance with ARARs criterion. | Routine construction activities. However, a significant amount of truck traffic will be required, increasing the complexity of implementing this alternative. |
| Cost (Present Worth) | $0 | $4,200,000 | $5,300,000 | $8,900,000 | $12,600,000 | $6,200,000 | $28,000,000 |

Note: Treatment of groundwater will occur as part of the OU1 remedy, reducing overall site risk.

## Alternative 1: No Action

Under this alternative no further effort or resources would be expended at the Woolfolk site. Because contaminated material would be left on the site, a review of the site conditions would be required every 5 years. The review is specified in the NCP. Alternative 1 serves as the baseline against which the effectiveness of other alternatives are judged. This alternative is required under the NCP.

### *Protection of Human Health and Environment*

Implementation of Alternative 1 would not meet EPA's criteria for protection of human health or the environment. The risk posed from the site would not be decreased. The risk of potential exposure would continue from the contaminated media (soil, groundwater, buildings, and sediment). Any migration of contamination would continue through soil-contaminant leaching and wind dispersion, groundwater migration, stormwater runoff, and infiltration.

### *Compliance with ARARs*

This alternative fails to comply or is not applicable with the ARARs. The Upper Cretaceous confined aquifer does not meet federal and state water quality standards; however, it is not used for drinking water in the vicinity of the site.

### *Long-Term Effectiveness and Permanence*

Alternative 1 does not provide long-term effectiveness and permanence. The risk currently associated with the site would not be decreased. Long-term risks posed by the site are described in the baseline risk assessment. The alternative provides no controls for the contaminants. Because of contaminants being left at the site, a review of the site conditions would be required every 5 years.

DRAFT

### *Reduction of Toxicity, Mobility, and Volume*

This alternative does not provide any reduction of toxicity, mobility, and volume and does not meet the statutory preference for treatment.

### *Short-Term Effectiveness*

Because no action would occur under this alternative, the level of risk to human health and the environment is described in the baseline risk assessment.

### *Implementability*

This alternative does not have a monitoring or construction component associated with it; therefore, there are no issues concerning implementation.

### *Cost*

Taking no action would require no expenditure of money for capital purposes. As part of the 5-year review process, samples may be required and time expended on preparing a report detailing the risk associated with the site; however, these costs have not been included in this FS.

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## Alternative 2: Land Improvements for Commercial/Industrial Development

The primary components of Alternative 2 are land improvements including new concrete and asphalt coverings over portions of the site where the contaminants in the on-site soil exceed target action levels and existing coverings are not in good condition. The existing cap would be maintained. Building W would be demolished. A TV camera inspection of the stormwater system from the site to the outfall and sediment sampling at the outfall would occur. Both the on- and off-site portion of the stormwater system would be decontaminated, if necessary.

On-site land improvements include installation of new pavement, construction of a multimedia cap at the pecan orchard and Building W, and construction of stormwater controls. New pavement would only be installed in areas where existing pavement is in disrepair. Approximately 92,000 $ft^2$ of the operating site would be capped with concrete suitable for truck use, and 121,000 $ft^2$ would be capped with asphalt. Land improvements would require the removal of the existing asphalt and concrete that is in poor condition to match existing grades within the operating portion of the site. Replacement of the concrete and asphalt caps will be required as they become worn and cracked. In addition, the majority of the trees in the pecan orchard would need to be removed. Approximately 3,300 cubic yards of soil and debris (existing concrete and asphalt but not including trees) would be excavated and sampled to determine if it is hazardous. This sitewide removal of 3,300 cubic yards of material will be required in order to maintain existing grades during construction of concrete and asphalt paving. The assumption is that the debris would not be hazardous and would be disposed of in an off-site Subtitle D landfill. Figure 4-2 shows the location and type of site improvements.

The CAMU regulations would be complied with concerning the on-site soil remediation activities. Land-use restrictions across the entire site would be necessary because contaminated soil is being left in place consistent with the Georgia Hazardous Site

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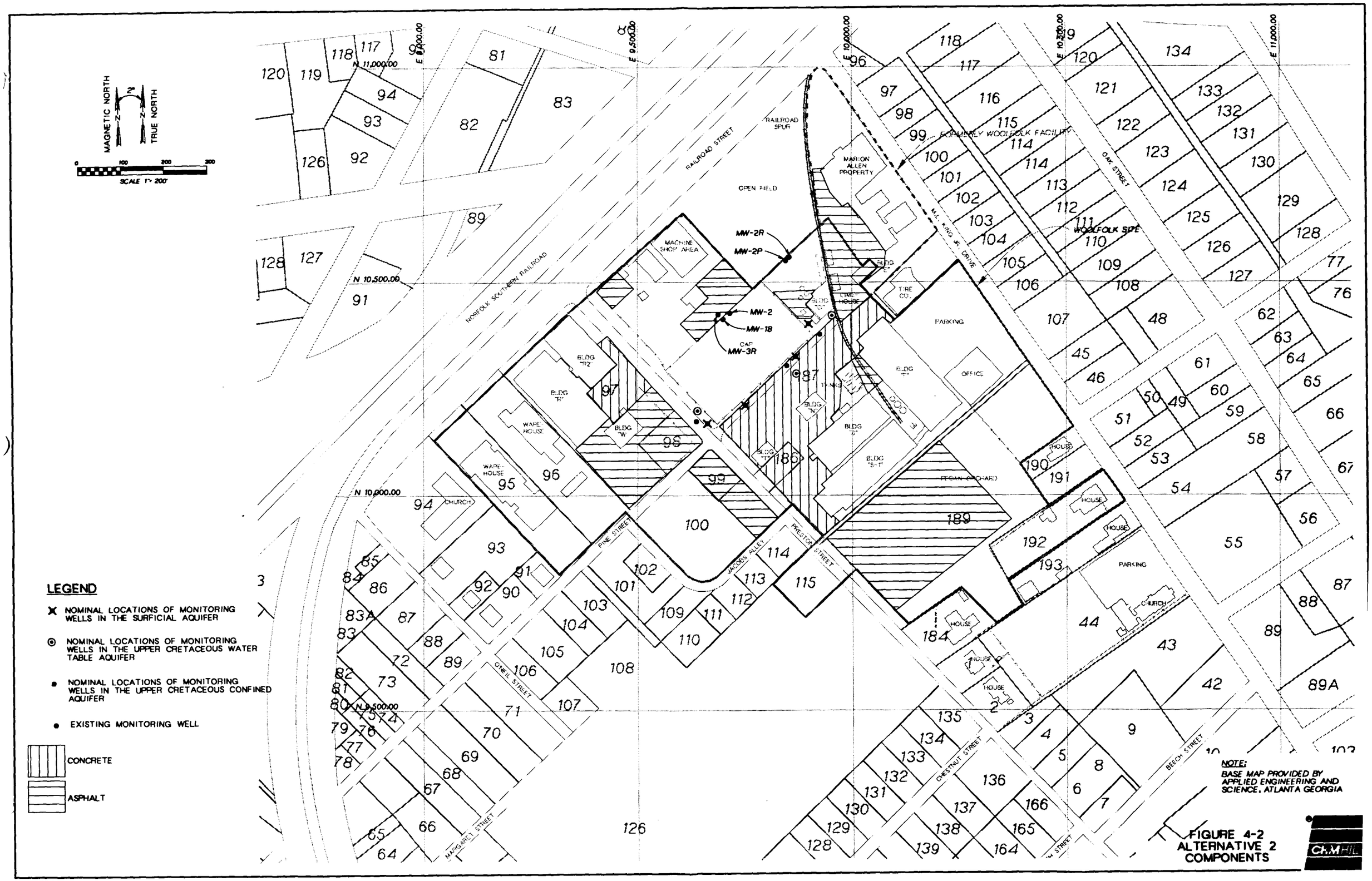


NOTE:
BASE MAP PROVIDED BY APPLIED ENGINEERING AND SCIENCE, ATLANTA GEORGIA

FIGURE 4-2
ALTERNATIVE 2
COMPONENTS

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Response Act Rules. These controls would include community zoning and creation of a development authority. The overall objective is to control development, construction, and access to on-site and off-site areas.

EPA has initiated with an unilateral administrative order to CGC removal actions at off-site locations with elevated arsenic levels. Properties have been or will be purchased or cleaned as part of this program. The community may be creating a redevelopment area to be used for commercial use. There will be no off-site properties that have arsenic concentrations greater than the proposed action level for the appropriate permanent land use.

The existing cap on the site, located in the previously remediated Area 1, would be left in place. Long-term monitoring and maintenance would be performed. Additional monitoring wells would be installed and existing wells would also be used to ensure the cap is performing as designed.

The presumed locations of the new monitoring wells in the aquifers are shown in Figure 4-2. They are located to assess the upgradient and downgradient water quality around the cap. Four new wells would be installed in the surficial aquifer, three in the Upper Cretaceous water table aquifer, and three wells in the Upper Cretaceous confined aquifer. Existing monitoring wells would also be used to assess water quality. The wells would be located upgradient and downgradient of the cap to determine any contaminant migration. The wells would be sampled annually and monitored for metals and pesticides, the primary contaminants found under the cap. As part of the OU1 remedy, monitoring wells and extraction wells will be installed. The location of these wells would affect the number and presumed location of wells used to monitor the cap.

Portions of Building E were cleaned, demolished, and disposed of in an off-site landfill. Portions of the building contained dioxin contamination and could not be cleaned or disposed of in the off-site landfill. This debris was placed in a Sea-Land container at the site for storage. Storage is required because no facility currently accepts dioxin-

DRAFT

contaminated material with elevated arsenic concentrations. The only facility that is currently permitted to accept dioxin-contaminated material cannot accept the Building E debris due to its elevated arsenic concentration. This concentration exceeds the TSDF's permit feed limitations. The soil underneath Building E will be paved over.

Building W would be demolished, generating roughly 450 cubic yards of debris. The debris would be sampled to determine if it is hazardous by toxicity characteristic. The assumption used for the cost estimate is that the debris would not be hazardous according to the toxicity characteristic and, therefore, could be landfilled without treatment. If the material is a hazardous waste, the material would be disposed in a off-site Subtitle C landfill, thus increasing cost.

Because Building W was a dry packaging site, some preparatory work would have to be performed to minimize the risks from demolition. The building would be inspected for asbestos and, if necessary, abatement measures taken. Dust inside the building would be removed by vacuuming and collecting the material into bags or drums for disposal. Piping, tanks, and other equipment inside the building would have to be removed before demolition. During demolition the building would be sprayed with a dust suppressant (water) to minimize dust generation. Once these measures are taken the building would be demolished. The soil under the building would be covered with asphalt.

During and after the remedial action, environmental monitoring would be performed. Monitoring would include:

- Groundwater monitoring around the existing cap
- Air monitoring of dust emissions during construction

The stormwater system would be inspected by video to determine the integrity of the pipe and the amount of sediment present in the system. Cleaning of the on- and off-site portions of the system, if necessary, would occur using water jetting and vacuuming the water and sediment into a holding tank. The equipment is capable of cleaning 400 to 500

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feet of pipe between access holes. Barring large buildups of sediment, hydrojetting can process 1,000 feet of pipe a day. The sediment in the tank would be sampled to determine if it is hazardous. The assumption is that the material would not be hazardous and would be disposed of in an off-site Subtitle D landfill. The water would be sampled, analyzed, and treated, if necessary, before disposal.

### *Protection of Human Health and Environment*

This alternative protects human health by preventing contact with on-site soil above target action levels by capping and landfilling the contamination. All off-site soil containing arsenic over the action levels has been removed or will be paved over. Long-term human exposure would be prevented at these properties. Secure storage or disposal of Building E and decontamination and securing of Building W would eliminate their associated risk to on-site workers. Control measures would be taken during the remedial activities to minimize the risk from those activities.

Environmental protection is provided through capping and landfilling. Capping would significantly reduce migration of contaminants through wind erosion, infiltration, or direct human or animal contact. Maintaining the existing cap would prevent migration of contaminants that are located beneath the cap.

On-site land use controls also would increase the level of long-term protection of public health and environment. Because soil above the target action levels would be left throughout the site, restrictions, such as excavation without proper personal protective equipment, would need to be enforced to protect the on-site worker from exposure.

### *Compliance with ARARs*

The chemical-specific ARARs are target action levels that have been developed based on a risk assessment. Contact with soil contaminants above the action levels will be eliminated

DRAFT

with the use of land improvements. There are no location-specific ARARs to meet. The significant action-specific ARAR is the CAMU regulations. The CAMU regulations allows soil consolidation within the CAMU without the LDR treatment requirements being applicable. Since the site would be considered a CAMU, the activities proposed would be in compliance with these regulations. The Georgia Hazardous Site Response Act rules for Type 5 standards will be met including appropriate restrictive covenants.

### *Long-Term Effectiveness and Permanence*

The exposure risk remaining at the site would be significantly reduced by the various land improvements and land-use restrictions. However, the amount of soil above the action level would be slightly reduced. The risk to on-site workers posed by the on-site structures would be eliminated. However, Building E debris must be stored at the site because the only permitted incineration site for dioxin-contaminated waste can not accept the waste due to the waste's high arsenic content. Any stormwater sediment in the stormwater conveyance system would be removed. This would eliminate all potential contact with contaminated sediments.

Operation and maintenance would be required to ensure the remedy performs effectively. The new caps and existing cap in Area 1 would have to be maintained to ensure their integrity remain intact.

An evaluation of the alternative would be required every 5 years after implementation. The evaluation is required by the NCP because soil above the target action level would be left at the site at the completion of the remedial activities.

### *Reduction of Toxicity, Mobility, and Volume*

This alternative reduces the migration potential of the contaminants in the on-site soil by covering the soil that exceeds the target action levels. The volume of soil would be

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slightly reduced, but the toxicity would not be changed. The covers would require maintenance to maintain their integrity. Dioxin-contaminated debris would be stored until a permitted treatment site is available.

### *Short-Term Effectiveness*

Implementation of this alternative would cause some adverse effects. A temporary increase in fugitive dust would be expected during the construction activities. However, dust generation can be controlled with the use of dust suppressants. Dust suppressants have been found to be effective during removal actions at off-site properties. Noise and vehicle exhaust would increase because of the use of heavy equipment required for the remediation. Additional truck traffic would be required for removal of soil and debris and to bring construction materials to the site.

For the on-site components of this alternative the short-term subchronic hazard index is 2.7 and the excess cancer risk is $2 \times 10^{-6}$. A description of how these levels were calculated is presented in Appendix G.

Workers who might be exposed during remedial activities would be required to use PPE. Environmental and worker monitoring would be conducted during these activities.

The estimated time frame for implementation of Alternative 2 is about 5 months after all construction contractors have been notified to start work.

### *Implementability*

This alternative is readily implementable. Land improvements, excavation, building demolition, and stormwater sewer cleaning are all routine activities or proven technologies. This alternative does not contain any components that are patented or proprietary. All equipment, materials, and monitoring capabilities exist and are readily available.

DRAFT

Additional truck traffic would be required to remove debris and soil along with delivering construction materials to the site. This alternative would generate the least additional truck traffic of any of the alternatives except for no action. The minimal truck traffic would provide the least disruption to the facility and local community.

### *Cost*

Table 4-2 presents a detailed breakdown of the costs associated with this alternative. A present-worth analysis also is provided.

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FIGURE 4-3
ALTERNATIVE 3
COMPONENTS

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### *Protection of Human Health and Environment*

The alternative protects human health by preventing contact with soil above the target action level. All soil with concentrations above the proposed target action levels would be paved over or excavated, consolidated, and landfilled, thus preventing contact and contaminant migration caused by wind erosion or infiltration. Continued operation and monitoring of the existing cap will prevent any potential impacts to groundwater. Protection of on-site workers would occur by the demolition of Building W and securing the dioxin-contaminated soil and debris from Building E.

The potential for contaminant migration caused by infiltration is less than Alternative 2, due to consolidation of the soil. The asphalt cap component of the landfill would cover all on-site soil above target action levels.

The short-term risks are higher than Alternative 2 due to more soil being excavated and greater truck traffic. All soil with concentrations above the action level would have to be excavated and handled. The land-use restrictions would be needed only in the location of the on-site Subtitle C landfill. The protection provided by these restrictions are the same as described under Alternative 2.

### *Compliance with ARARs*

With regard to ARARs, this alternative would be similar to Alternative 2. The primary contaminant at the site (arsenic) is relatively immobile. By placing the soil that is contaminated by arsenic at or above target action levels in a Subtitle C landfill, the contaminant migration potential is essentially eliminated.

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### *Long-Term Effectiveness and Permanence*

The residual risk at the site essentially would be eliminated if the Subtitle C landfill is maintained. All contaminated soil and debris would be consolidated in one location, making monitoring easier. Long-term risk would no longer exist in areas that were excavated and demolished. This includes buildings E and W, and the operating portions of the site. Long-term maintenance of all soil and debris management systems would be required to ensure the remedy performs effectively. The existing cap in Area 1 would be maintained to ensure that its integrity remains intact.

An evaluation of the alternative would be required every 5 years after implementation as described under Alternative 2.

### *Reduction of Toxicity, Mobility, and Volume*

This alternative essentially eliminates the migration potential of contaminants found in the on-site soil and on the structures by containing the soil and structures in a Subtitle C landfill. The migration potential would be eliminated by reducing stormwater and by collecting leachate that might accumulate. All the other media addressed by this alternative are similar to Alternative 2 with regard to reducing toxicity, mobility, and volume of contaminants.

### *Short-Term Effectiveness*

Implementation of this alternative would have some potential adverse effects. An increase in fugitive dust could result during the excavation and transportation of soil around the site, construction of the Subtitle C landfill system, and demolition of Building W. All of these activities would increase noise and vehicle exhaust because of the heavy equipment required for these actions. More truck traffic that Alternative 2 would occur due to moving all the soil around the site and construction of the Subtitle C landfill. Construction

DRAFT

of the landfill will require hauling of excess soil from the landfill excavation and delivery of the construction materials to the site. Dust suppressants would be used to reduce the potential negative short-term impacts of contaminated dust generation.

The on-site components include a short-term subchronic hazard index of 4.3 and excess cancer risk for this alternative of $2x10^{-5}$. The estimated number of vehicular accidents is 1.3. The estimated number of vehicular accidents involving injuries is 0.6. Appendix G provides a discussion of how these levels were derived.

The estimated time frame for implementation of Alternative 3 is about 6 months after all construction contractors have started work.

### *Implementability*

These remedial actions are readily implementable. The elements of this alternative are all routine construction activities and do not contain any components that are patented or proprietary. All equipment, materials, and monitoring capabilities exist and are readily available. Additional truck traffic will result due to construction of the landfill.

### *Cost*

Table 4-3 provides a detailed breakdown of costs, including a present-worth analysis.

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**Table 4-3**
**COSTS FOR ALTERNATIVE 3**
**ON-SITE SUBTITLE C LANDFILL**

| Component | Capital Cost | Yearly O&M | Total Present Worth of O&M[1] | Present Worth[2] |
|---|---|---|---|---|
| **ON-SITE SOIL** | | | | |
| Excavation | 133,000 | 0 | 0 | 133,000 |
| Subtitle C Landfill | 1,321,000 | 20,000 | 248,000 | 1,569,000 |
| Portland Concrete Cap | 907,000 | 5,000 | 62,000 | 969,000 |
| Hydraulic Asphalt Cap | 176,000 | 10,000 | 125,000 | 301,000 |
| Restoration | 198,000 | 0 | 0 | 198,000 |
| **EXISTING CAP** | | | | |
| Monitoring | 166,000 | 30,000 | 373,000 | 539,000 |
| **STRUCTURES** | | | | |
| Demolition and Disposal of Building W | 570,000 | 0 | 0 | 570,000 |
| Storage of Building E | 0 | 1,000 | 13,000 | 13,000 |
| **STORMWATER SYSTEM** | | | | |
| Decontaminate Line | 178,000 | 0 | 0 | 178,000 |
| **ENGINEERING** | | | | |
| Engineering Services | 800,000 | 0 | 0 | 800,000 |
| **TOTAL** | 4,449,000 | 66,000 | 821,000 | 5,300,000 |

**Notes:**
[1]Operation and maintenance calculated over 30 years.
[2]Present worth based on 7 percent interest rate.

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## Alternative 4: S/S Treatment of Hazardous Soil and On-Site Subtitle C Landfill

This alternative requires the segregation and S/S treatment of hazardous soil, construction of an on-site Subtitle C landfill, continued operation and monitoring of the existing cap, building demolition, and improvements to the stormwater system.

On-site soil would be sampled and analyzed to determine areas that would be classified as hazardous waste. The soil is not a listed waste; however, soil in certain areas of the site may be found to be hazardous by toxicity for arsenic. Potential areas that may be found to be hazardous would be sampled and analyzed by the Toxicity Characteristic Leaching Procedure (TCLP). Table 4-4 lists the regulatory levels for TCLP extract of compounds found at the Woolfolk site. These levels would be used to segregate hazardous and nonhazardous soil. The areas that would be sampled contain total arsenic levels greater than 500 mg/kg. These areas are identified in Figure 4-4. The areas identified in Figure 4-4 contain elevated levels of the chemicals of concern. With regard to health risk, arsenic is the leading contaminant of concern and is detected throughout the site at higher levels when compared to the other contaminants. By choosing a value of 500 mg/kg of arsenic, all areas of the site that contain the highest levels of the other chemicals of concern, will be sampled and analyzed to determine if the soil is hazardous by characteristic. According to the TCLP sample results obtained during the Woolfolk Chemical soil treatability study only arsenic and lead exceeded the regulatory levels. The samples were composites of soil from areas of elevated contamination. The samples are a good representation of the soil contaminant composition in the areas identified in Figure 4-4.

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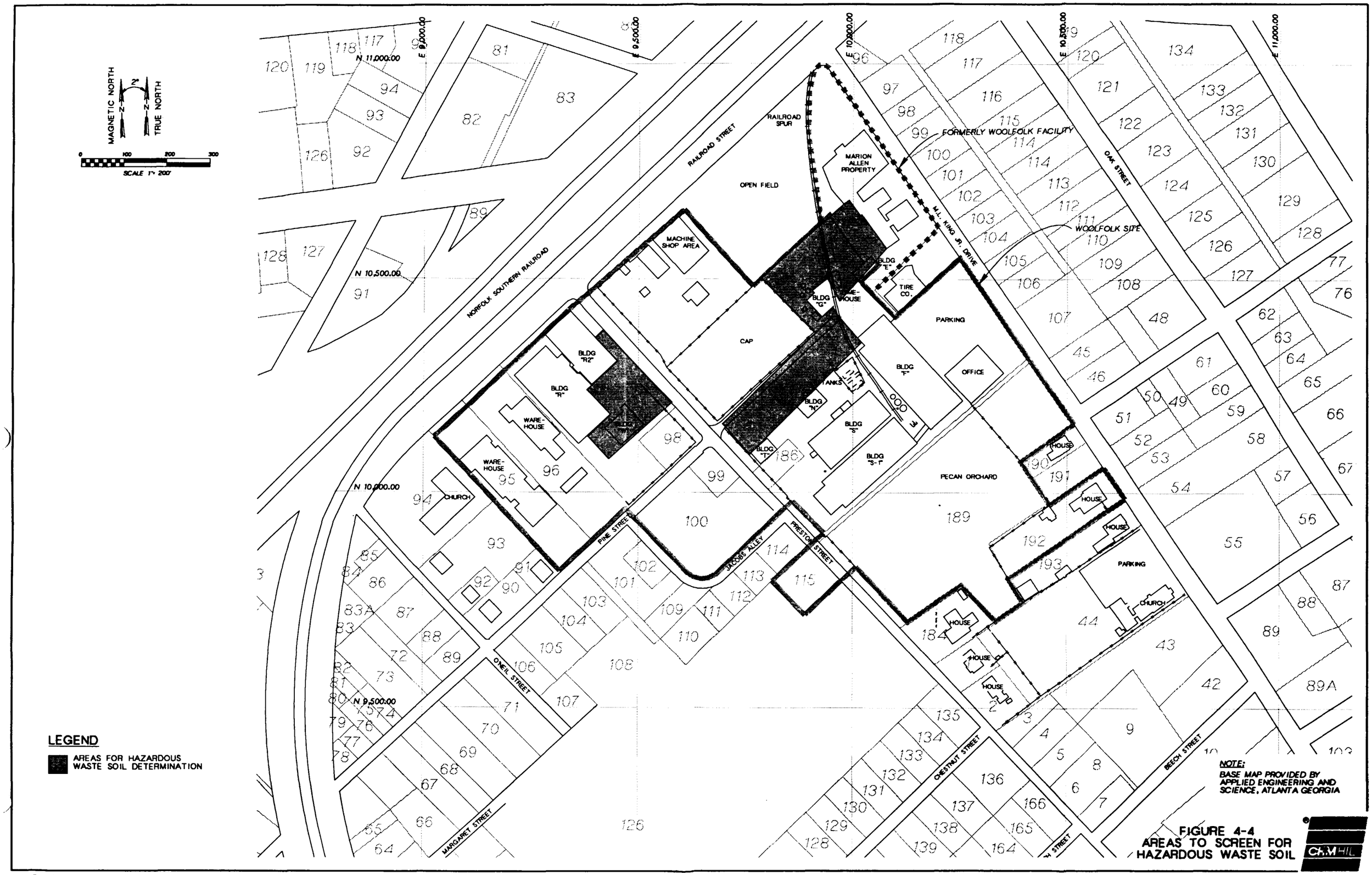


## LEGEND

AREAS FOR HAZARDOUS WASTE SOIL DETERMINATION

NOTE:
BASE MAP PROVIDED BY APPLIED ENGINEERING AND SCIENCE, ATLANTA GEORGIA

**FIGURE 4-4**
**AREAS TO SCREEN FOR HAZARDOUS WASTE SOIL**

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| Table 4-4<br>MAXIMUM CONCENTRATION OF CONTAMINANTS FOR THE TOXICITY CHARACTERISTIC LEACHING PROCEDURE | |
|---|---|
| **Contaminant** | **Regulatory Level (mg/l)** |
| Arsenic | 5.0 |
| Cadmium | 1.0 |
| Lead | 5.0 |
| Chlordane | 0.03 |
| Lindane | 0.4 |
| Toxaphene | 0.5 |
| Pentachlorophenol | 100.0 |

Soil found to be hazardous would be treated using S/S. An estimated 5,700 cubic yards of soil and debris would require treatment. An S/S treatment unit would be brought to the site. S/S treatment units are basically large mixers with methods of conveying the soil and S/S reagents (chemicals) to the mixer. The units are adaptable for various quantities of soil required to be processed. The major design component associated with S/S treatment is the mix ratio. The mix ratio is the quantity of reagents added to the soil to achieve the treatment goals. The mix ratios are measured on the basis of the weight of the original amount of soil.

S/S treatability testing has been performed on Woolfolk soil. Two separate vendor processes were examined. Table 4-5 gives the analytical results of the tests, while Table 4-6 gives the mix ratios for the treatability study.

DRAFT

| Table 4-5<br>TCLP RESULTS OF TREATABILITY TESTING | | | | | |
|---|---|---|---|---|---|
| **Constituent** | **untreated (μg/l)** | **test #1 (μg/l)** | **percent reduction** | **test #2 (μg/l)** | **percent reduction** |
| Arsenic | 7,830 | 6,364 | 18.7 | 211 | 97.3 |
| Cadmium | 178 N | <5.0 | >97.2 | <5.0 | >97.2 |
| Lead | 11,900 | 4 | >99.9 | 66.4 | 99.4 |
| Lindane | 15 | 2 U | >86.7 | 2 U | >86.7 |

**Notes:**
Complete results presented in Volume 2 of FS.
N - Spiked sample recovery not within control limits.
U - Indicates the compound was analyzed for but not detected. Adjacent value indicates the reporting limit for the compound.

| Table 4-6<br>TEST MIX RATIOS | | | | |
|---|---|---|---|---|
| **Materials** | **test #1 (grams)** | **weight percent** | **test #2 (grams)** | **weight percent** |
| Soil | 1853 | -- | 300 | -- |
| Portland Cement | 278 | 15 | 96 | 32 |
| Flyash, Type F | 0 | 0 | 144 | 48 |
| Proprietary Reagent | 0 | 0 | 4.8 | 1.6 |
| Water | 15 | 0.8 | 142 | 47.3 |

DRAFT

A Subtitle C landfill would be constructed on the site to be used for the disposal of both treated and untreated soil. An estimated 7,200 cubic yards of treated on-site soil and debris and 11,100 cubic yards of untreated on-site soil would be disposed of in the Subtitle C landfill. The landfill would be located in the pecan orchard. It would cover an area of approximately 1.4 acres. The height of the landfill would range from 5 to 10 feet

depending upon the location. A typical cross section of a Subtitle C landfill is illustrated in Figure 3-4.

All other components of this alternative are the same as Alternative 3. Alternative 4 components are illustrated in Figure 4-5.

### *Protection of Human Health and Environment*

This alternative protects human health by preventing contact with soil above the target action levels. This would be accomplished through excavation, treatment, and landfilling of the soil. Soil that exhibits hazardous characteristics would be treated using S/S and landfilled, and all other excavated soil would be landfilled.

Overall protection of human health and environment would be similar to Alternative 3. However, Alternative 4 further reduces but may not eliminate the migration potential of the arsenic by treatment. This further reduces the migration potential of the contaminants bound to the soil. The short-term risks are higher for this Alternative than Alternative 3. This is due to the additional soil handling required for treatment and additional trucking activity at the site.

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### *Compliance with ARARs*

This alternative would be similar to Alternative 3 with regard to ARARs. The only difference is the soil that exceeds the TC for arsenic would be treated before landfilling.

### *Long-Term Effectiveness and Permanence*

The risk remaining at the site would be similar to Alternative 3. Long-term effectiveness is offered by reducing the mobility of arsenic through treatment of the contaminated soil before landfilling. The treatability studies performed as part of the FS concluded that S/S

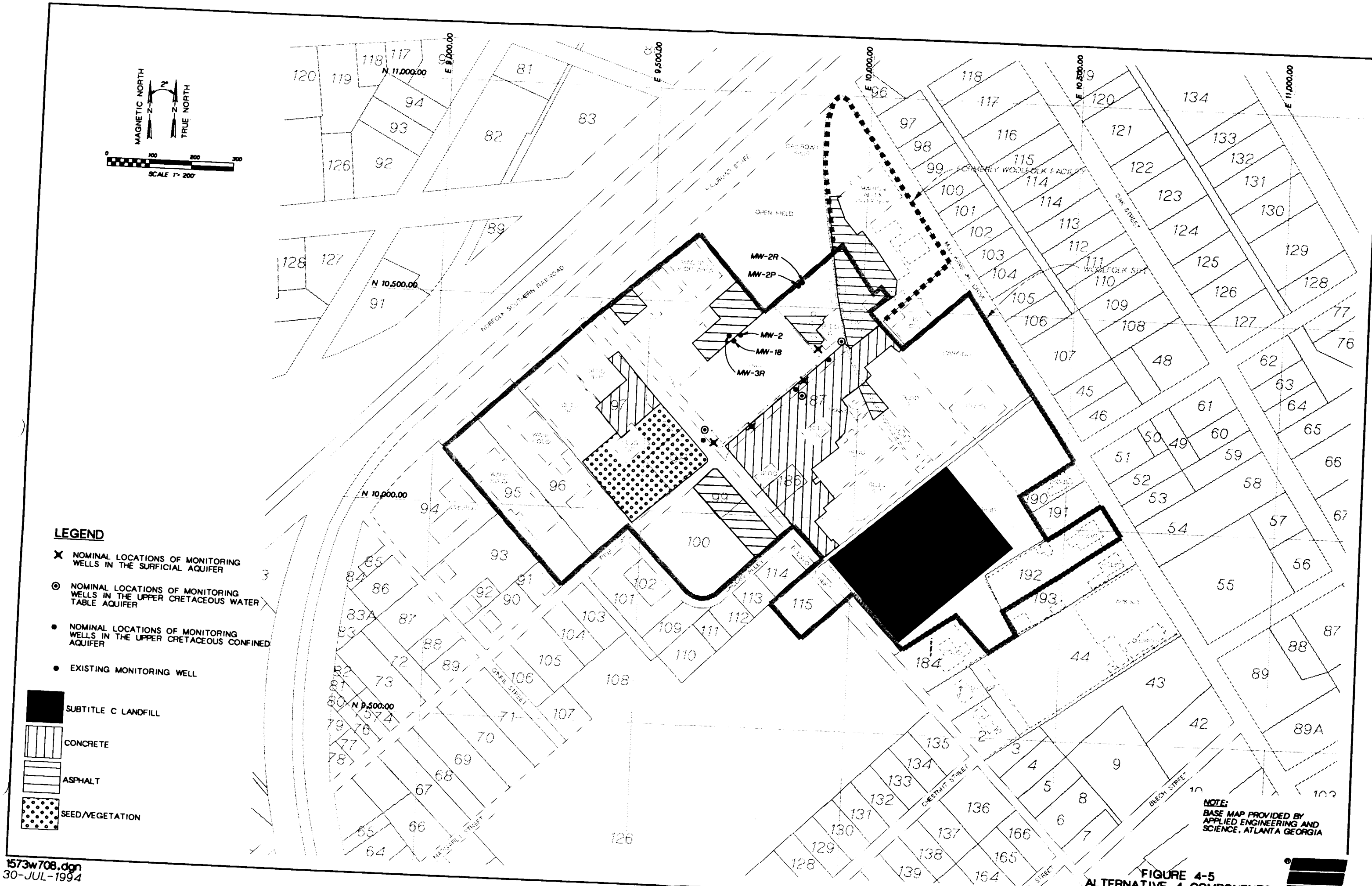


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FIGURE 4-5
ALTERNATIVE 4 COMPONENTS

treatment is effective in reducing the leaching potential of several contaminants (see Table 4-5). The existing cap would be maintained to ensure that its integrity remains intact.

### *Reduction of Toxicity, Mobility, and Volume*

This alternative essentially eliminates the migration potential of contaminants found in the soil and on the structures by treatment and/or containment in a Subtitle C landfill. Treatment reduces the mobility of the contaminants bound in the soil. The volume of waste would increase by approximately 1,000 cubic yards due to the S/S treatment process. The toxicity of the arsenic would be unchanged.

### *Short-term Effectiveness*

Implementation of this alternative would have some potential adverse effects. The alternative would increase materials handling and truck traffic. The operation of the S/S treatment system would create fugitive dust emissions that could need to be controlled. The material requiring treatment would need to be kept wet to minimize dust generation.

The on-site components include a short-term subchronic hazard index of 4.3 and excess cancer risk for this alternative of $3x10^{-5}$. The short-term risk exceeds the long-term risk. The estimated number of vehicular accidents is 1.7. The estimated number of vehicular accidents involving injuries is 0.75. A description of how those levels were derived is presented in Appendix G.

The estimated time frame for implementation of this alternative is about 7 months after all construction contractors have started work.

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### *Implementability*

This alternative is readily implementable. The elements of this remedial action are all routine construction activities or proven treatment technology. Several contractors are available that perform S/S treatment. All equipment, materials, and monitoring capabilities exist and are readily available. Implementation will increase dust generation, materials handling, and local truck traffic.

### *Cost*

Table 4-7 provides a detailed breakdown of costs, including a present-worth analysis.

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**Table 4-7**
**COSTS FOR ALTERNATIVE 4**
**S/S TREATMENT OF HAZARDOUS SOIL**
**AND SUBTITLE C LANDFILL**

| Component | Capital Cost | Yearly O&M | Total Present Worth of O&M[1] | Present Worth[2] |
|---|---|---|---|---|
| **ON-SITE SOIL** | | | | |
| Excavation | 341,000 | 0 | 0 | 341,000 |
| S/S Treatment | 2,970,000 | 0 | 0 | 2,970,000 |
| Subtitle C Landfill | 1,646,000 | 20,000 | 248,000 | 1,894,000 |
| Portland Concrete Cap | 1,015,000 | 5,000 | 62,000 | 1,077,000 |
| Hydraulic Asphalt Cap | 197,000 | 10,000 | 125,000 | 322,000 |
| Restoration | 221,000 | 0 | 0 | 221,000 |
| **EXISTING CAP** | | | | |
| Monitoring | 166,000 | 30,000 | 373,000 | 539,000 |
| **STRUCTURES** | | | | |
| Demolition and Disposal of Building W | 570,000 | 0 | 0 | 600,000 |
| Storage of Building E | 0 | 1,000 | 13,000 | 13,000 |
| **STORMWATER SYSTEM** | | | | |
| Decontaminate Line | 178,000 | 0 | 0 | 178,000 |
| **ENGINEERING** | | | | |
| Engineering Services | 800,000 | 0 | 0 | 800,000 |
| **TOTAL** | 8,104,000 | 66,000 | 821,000 | 8,900,000 |

**Notes:**
[1]Operation and maintenance calculated over 30 years.
[2]Present worth based on 7 percent interest rate.

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## Alternative 5: In Situ S/S Treatment

This alternative includes in situ treatment of contaminated on-site soil, construction of an on-site Subtitle D landfill, continued maintenance and monitoring of the existing cap, building demolition, and stormwater system improvements.

On-site soil that exceeds target action levels, excluding the capped area, would be treated either using in situ S/S or paved over. In situ treatment would be accomplished by mixing the reagent into the contaminated soil using a rotary tilling device for shallow soil and an auguring device for deeper soil. The rotary tilling equipment can perform effective treatment to approximately 2 feet in depth. A majority of the contamination is present to this depth. For depths of 5 to 8 feet, a multiple augers device could be used. This type of treatment would reduce the amount of soil requiring excavation. S/S treatability tests were performed on the Woolfolk soil. The results of the study are summarized under Alternative 4.

S/S causes the soil to expand and increase in volume. This occurs with both in situ and ex situ treatment. Assuming a 25 percent volume increase, treatment to a depth of four feet increases the elevation one foot. The treated areas also would be capped with concrete and asphalt. To accommodate the volume increase and land improvements and to match existing grades, some soil would have to be excavated. Approximately 9,400 cubic yards of soil and debris would have to be excavated to allow for regrading and expansion. This volume of soil and debris would be treated ex situ and then would be placed in the pecan orchard in the landfill.

All treated areas would be capped after the completion of in situ S/S. The treated areas would be capped to minimize infiltration contact with the stabilized material. New concrete and asphalt would be placed over the operating portion of the site, as in all alternatives. Please refer to Alternative 2 for descriptions of the pavement replacement. Figure 4-6 shows the limits of in situ treatment.

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All other components of this alternative are the same as Alternative 3.

### *Protection of Human Health and Environment*

This alternative would provide long-term protection to public health and the environment by treating and capping the soil to prevent contact with on-site contaminated soil. This alternative provides greater overall long-term protection of public health and the environment than Alternative 2 because the contaminated soil is treated before capping. Demolition and disposal of Building W and storage of Building E debris and soil would eliminate their associated risk to on-site workers. Monitoring performed during the remedial activities would determine the risk to the community and the workers.

The short-term risks are higher than Alternatives 2, 3, and 4. The short-term risks are also higher than the long-term risks. The protection of human health and environment offered by land-use controls are the same as described for Alternative 2.

### *Compliance with ARARs*

The discussion of ARARs for Alternative 5 is essentially the same as described for Alternative 2.

### *Long-Term Effectiveness and Permanence*

The potential for exposure caused by the contaminated on-site soil would be further minimized because of S/S treatment and capping. The amount of contaminated soil would not change; however, the migration potential of the target soil contaminants would be further reduced. Treatment by S/S was shown to be effective during the treatability studies performed during this FS. All other components of this alternative offer the same level of effectiveness as described under Alternative 2. The existing cap in Area 1 would be maintained to ensure that its integrity remains intact.

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### *Reduction of Toxicity, Mobility, and Volume*

This alternative reduces the mobility of contaminants in the on-site soil through S/S treatment and capping. Treatment reduces the mobility and the various caps eliminate stormwater infiltration. This combination would provide further protection by reducing the migration potential of the contaminants. The reduction in the leaching potential of the contaminants is presented in the treatability study results in Table 4-5. The volume of waste would significantly increase. The total volume increase would be 4,000 $yd^3$. The toxicity of the arsenic would not be changed.

### *Short-Term Effectiveness*

Implementation of this alternative would have some potential adverse effects. Site operations would be significantly interrupted during remedial work. A temporary increase in fugitive dust would be expected during remedial and construction activities and demolition of the structures. Dust would be controlled with the use of dust suppressants. In addition, noise and vehicle exhaust would increase because of the heavy equipment required for the remediation. Excess truck traffic would be generated during construction of the landfill and delivery of the materials for the treatment system.

The on-site components include a short-term subchronic hazard index of 4.3 and excess cancer risk for this alternative of $4 \times 10^{-5}$. The estimated number of vehicular accidents is 0.6. The estimated number of accidents involving injuries is 0.3. The basis for these levels is presented in Appendix G.

Workers with the potential for exposure during remedial activities would be required to use PPE. Environmental and worker monitoring would be conducted during these activities.

The estimated time frame for implementation of Alternative 5 is about 8 months after all construction contractors start work.

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### *Implementability*

In situ S/S is becoming a more standard technology within the remediation industry, and several contractors perform this type of treatment. The depth of contamination also is conducive to in situ work and would not require specialized deep-mixing equipment. The equipment and possibly reagents added to the S/S mixture may be patented or proprietary. Patented equipment or proprietary reagents may make implementation more difficult or costly. One complicating factor during implementation would be protection of existing on-site utilities (i.e., sewer, water, etc.).

Since much of the in situ treatment will take place in the center of the site, longer delays and more difficulty will be encountered. Delays will be caused by the presence of buried utilities and the deeper depths of contamination. Buried utilities will require bracing and/or protection to ensure they are not broken by the in situ equipment or the injected grout. These delays will significantly impact site operations. The long-term disruptions may result in the loss of jobs at the facility due to the inability of the facility to operate.

### *Cost*

Table 4-8 provides a detailed breakdown of costs, including a present-worth analysis.

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**Table 4-8**
**COSTS FOR ALTERNATIVE 5**
**IN SITU S/S TREATMENT**

| Component | Capital Cost | Yearly O&M | Total Present Worth of O&M[1] | Present Worth[2] |
|---|---|---|---|---|
| **ON-SITE SOIL** | | | | |
| Ex Situ S/S Treatment | 5,065,000 | 0 | 0 | 5,065,000 |
| In Situ S/S Treatment | 2,793,000 | 0 | 0 | 2,793,000 |
| Subtitle D Landfill | 720,000 | 12,000 | 149,000 | 869,000 |
| Portland Concrete Cap | 994,000 | 5,000 | 62,000 | 1,056,000 |
| Hydraulic Asphalt Cap | 276,000 | 10,000 | 125,000 | 401,000 |
| **EXISTING CAP** | | | | |
| Monitoring | 166,000 | 30,000 | 373,000 | 539,000 |
| **STRUCTURES** | | | | |
| Demolition and Disposal of Building W | 570,000 | 0 | 0 | 570,000 |
| Storage of Building E | 0 | 1,000 | 13,000 | 13,000 |
| **STORMWATER SYSTEM** | | | | |
| Decontaminate Line | 178,000 | 0 | 0 | 178,000 |
| **ENGINEERING** | | | | |
| Engineering Services | 1,100,000 | 0 | 0 | 1,100,000 |
| **TOTAL** | 11,862,000 | 58,000 | 722,000 | 12,600,000 |

**Notes:**
[1]Operation and maintenance calculated over 30 years.
[2]Present worth based on 7 percent interest rate.

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## Alternative 6: On-Site Subtitle C and D Landfills

This alternative requires soil excavation, construction of a Subtitle C and Subtitle D landfill, excavation of the material beneath the existing cap, building demolition, and stormwater system improvements. Figure 4-7 illustrates the locations of the major alternative components.

Approximately 5,700 cubic yards of soil and debris, with an arsenic concentration exceeding 500 ppm would be excavated. This amount does not include the material beneath the existing cap. As discussed earlier a concentration of 500 ppm of arsenic may be sufficient to exceed the TC level. Areas suspected to be hazardous would be sampled and analyzed by the TCLP. These areas are identified in Figure 4-4. This material would be disposed of in a Subtitle C landfill.

The material beneath the existing cap would be excavated. Approximately 8,100 cubic yards of material would be excavated. It is assumed that all of the material removed would exceed the 500-ppm arsenic concentration. This material would be combined with the 5,700 cubic yards and placed into a Subtitle C landfill. The landfill area would be approximately 1.2 acres.

The following material would be excavated and disposed of in a Subtitle D landfill:

- On-site soil that equals or exceeds the target action levels but contains less than 500 ppm of arsenic (estimated volume is 9,200 cubic yards).

- On-site Building W debris (estimated volume is 450 cubic yards).

A total of about 9,700 cubic yards of soil above the proposed target action levels and debris will be disposed of in the Subtitle D landfill. The landfill area would be approximately 0.8 acres.

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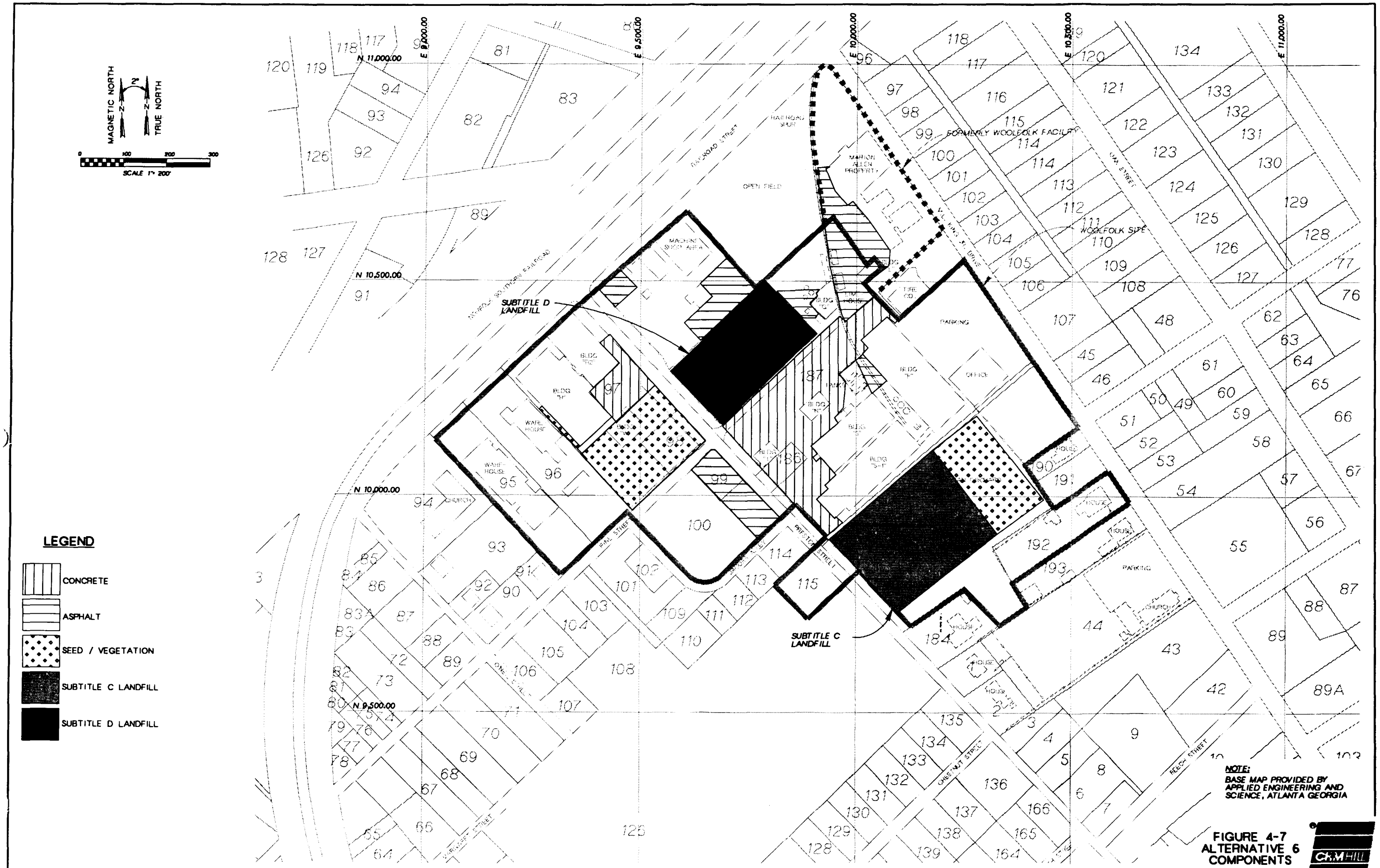


FIGURE 4-7
ALTERNATIVE 6
COMPONENTS

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Land improvements would be very similar to those in Alternatives 3 and 4. They would consist of concrete and asphalt caps in the vehicular traffic areas and vegetative cover in other areas.

All other components of this alternative are the same as those in Alternatives 3 and 4.

### *Protection of Human Health and Environment*

This alternative reduces the overall risk associated with the site. The alternative accomplishes the remedial action objectives, if properly constructed, operated, and maintained.

Excavation of the material under the existing cap would not be protective. Excavation of the material and relandfilling it on-site would only amount to moving material around, adds on long-term protectiveness and creates short-term risk. The existing cap would be equivalent to any new cap constructed for the on-site Subtitle C landfill.

The short-term risk for this alternative is greater than the long-term risk posed by the site. At $8x10^{-5}$ the short-term risks almost fall outside EPA's acceptable range. The truck traffic associated with the remedial action will be higher than the other alternatives. This is due to removal and delivery of soil and other materials related to constructing two landfills at the site.

### *Compliance with ARARs*

All ARARs would be complied with, including the State of Georgia's Subtitle D landfill siting requirements, if determined to be applicable.

DRAFT

### *Long-Term Effectiveness and Permanence*

This alternative would be effective in the long term if the landfills are operated and maintained properly. The existing cap would be removed and placed into the Subtitle C landfill. Placement of this material into the Subtitle C landfill will not increase the long-term protectiveness. An equivalent level of protectiveness is currently provided by the existing cap. Excavation of the material and moving it to a new location will not increase the long-term protection.

The long-term effectiveness of this alternative would be the same as that of Alternative 4.

### *Reduction of Toxicity, Mobility, and Volume*

This alternative places the soil that exceeds any TC levels into an on-site Subtitle C landfill from an area with a RCRA-type cap. This technology reduces the mobility of the contaminants in the soil due to the landfill cap. The cap design assumption for RCRA landfills is the cap should be able to protect the environment assuming the liner fails. The existing cap would be removed and the material placed into the hazardous landfill. The toxicity and volume of waste would not change.

The dioxin-contaminated soil and debris would be treated in the same manner as proposed in all other alternatives.

### *Short-Term Effectiveness*

The landfills would be located in areas bordered by industrial and commercial properties and, therefore, would have minimal impact on residential areas.

The excavation of the existing cap will create adverse short-term risks to the workers at the site. The material that will be excavated from the existing cap contains arsenic

DRAFT

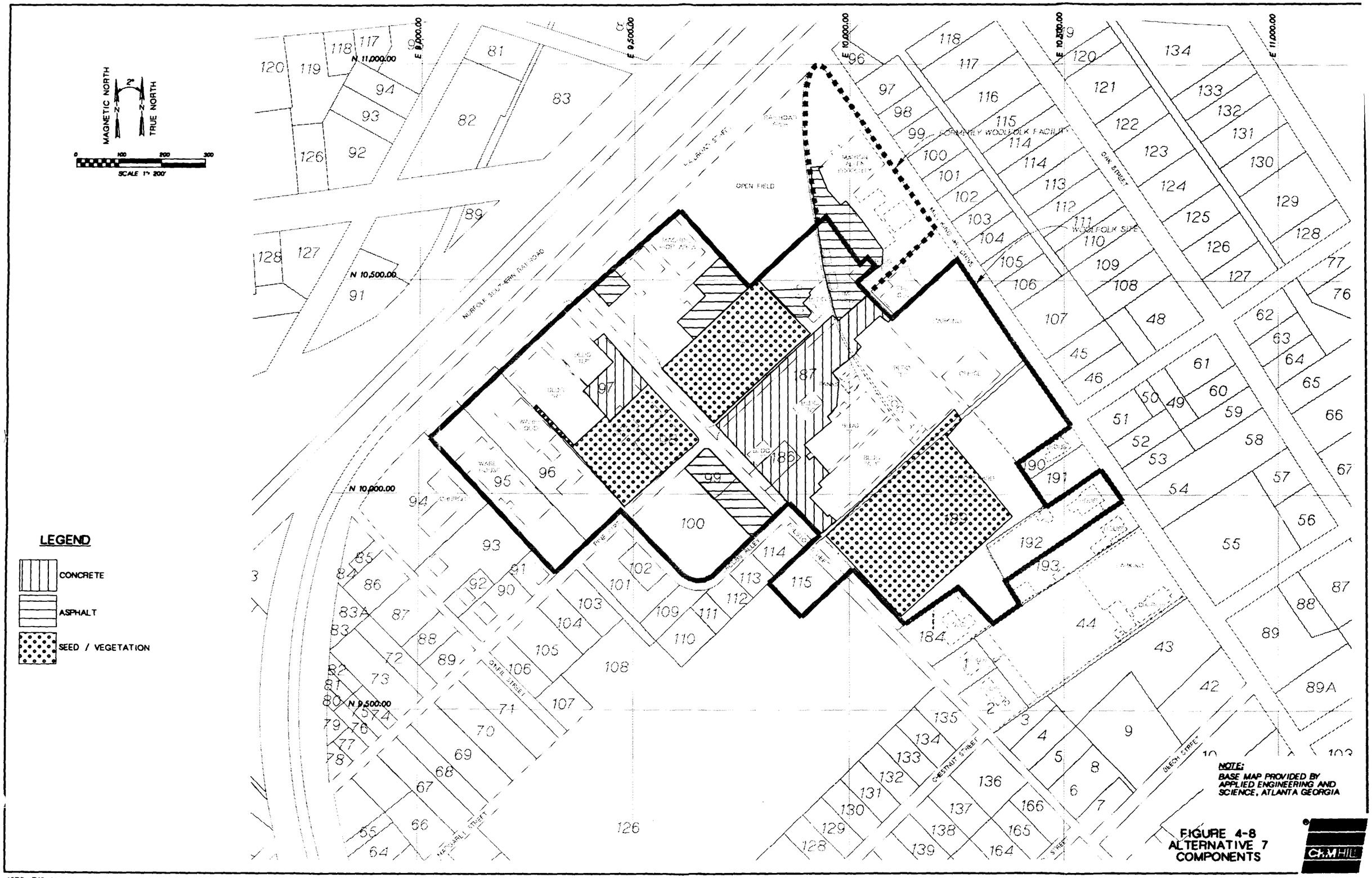


FIGURE 4-8
ALTERNATIVE 7
COMPONENTS

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This alternative provides long-term protection to human health and the environment at the site by removing contaminated soil and disposing of the material in an engineered and permitted landfill. The risk posed by the material would be transferred to another site. This would be accomplished through excavation, S/S treatment, and transportation to an off-site Subtitle C site. Treatment and offsite landfilling would eliminate future human contact and contaminant migration at the site because the material would be removed. Negative short-term effects on the public health and the environment are similar to those described for Alternative 6 with the added effect of a significant increase in truck traffic. This in turn increases the likelihood of vehicular accidents.

### *Compliance with ARARs*

This alternative would be the same as Alternative 4 with regard to ARARs.

### *Long-Term Effectiveness and Permanence*

The residual risk at the site caused by contaminated soil would be eliminated because all contaminated soil at or above target action levels would be removed from the site. However, the risk would be transferred to another community. The long-term effectiveness of this alternative for other media and operable units is similar to alternatives 3 and 4.

### *Reduction of Toxicity, Mobility, and Volume*

This alternative reduces the mobility of contaminants in the on-site soil through S/S treatment and migration potential by off-site disposal in a Subtitle C landfill.

DRAFT

### *Short-Term Effectiveness*

Implementing this alternative would have the most adverse effects on human health and the environment. Fugitive dust would increase during excavation and transportation of soil around the site, operation of the S/S treatment system, demolition of the structures, and offsite transportation to a Subtitle C landfill. In addition, because on-site soil is to be disposed of offsite, a significant increase in truck traffic would occur for approximately 5 months. The probability of traffic accidents on the roads between the Woolfolk site and the disposal site would increase.

The on-site components include a short-term subchronic hazard index of 6.6 and excess cancer risk for this alternative of $2x10^{-4}$. This exceeds EPA's acceptable range for risk. The estimated number of vehicular accidents is 5. The estimated number of vehicular accidents involving injury is 2.3. The basis for these levels is presented in Appendix G.

The estimated time frame for implementation of Alternative 7 is about 9 months after all the construction contractors start work.

### *Implementability*

This alternative is implementable. The elements of this remedial action are all routine construction activities or a proven treatment technology. Several contractors are available that perform S/S treatment. At least two large Subtitle C landfills are located within approximately 300 miles from the site. All equipment, materials, and monitoring capabilities exist and are readily available. Truck traffic would significantly increase with the removal of soil and restoration of the site.

### *Cost*

Table 4-10 provides a detailed breakdown of costs, including a present-worth analysis.

DRAFT

**Table 4-10**
**COSTS FOR ALTERNATIVE 7**
**S/S TREATMENT OF HAZARDOUS SOIL AND OFF-SITE DISPOSAL**

| Component | Capital Cost | Yearly O&M | Total Present Worth of O&M[1] | Present Worth[2] |
|---|---|---|---|---|
| **On-site SOIL** | | | | |
| Excavation | 335,000 | 0 | 0 | 335,000 |
| S/S Treatment | 2,919,000 | 0 | 0 | 2,919,000 |
| Off-Site Disposal | 10,185,000 | 0 | 0 | 10,185,000 |
| Portland Concrete Cap | 997,000 | 5,000 | 62,000 | 1,059,000 |
| Hydraulic Asphalt Cap | 193,000 | 10,000 | 125,000 | 318,000 |
| Restoration | 245,000 | 0 | 0 | 245,000 |
| **EXISTING CAP** | | | | |
| Excavation | 205,000 | 0 | 0 | 205,000 |
| S/S Treatment | 5,798,000 | 0 | 0 | 5,798,000 |
| Off-Site Disposal | 5,121,000 | 0 | 0 | 5,121,000 |
| Restoration | 95,000 | 0 | 0 | 95,000 |
| **STRUCTURES** | | | | |
| Demolition and Disposal of Building W | 615,000 | 0 | 0 | 615,000 |
| Storage of Building E | 0 | 1,000 | 13,000 | 13,000 |
| **STORMWATER SYSTEM** | | | | |
| Decontaminate Line | 178,000 | 0 | 0 | 178,000 |
| **ENGINEERING** | | | | |
| Engineering Services | 900,000 | 0 | 0 | 900,000 |
| **TOTAL** | 27,786,000 | 16,000 | 200,000 | 28,000,000 |

**Notes:**
[1]Operation and maintenance calculated over 30 years.
[2]Present worth based on 7 percent interest rate.

DRAFT

## Comparative Analysis

In the following analysis, the alternatives are evaluated in relation to one another for each of the seven evaluation criteria. The purpose of this analysis is to identify the relative advantages and disadvantages of each alternative. Table 4-11 contains a detailed summary of this analysis.

### Overall Protection of Human Health and the Environment

All of the alternatives, except Alternative 1 (No Action), address the remedial action objectives. Alternatives 2 and 3 would provide adequate overall protection of human health and the environment. Alternatives 2 and 3 short-term risks are less than long-term risks. However, Alternatives 4, 5, and 6 have short-term risks greater than long-term risks. Alternative 7 has short-term risks greater than the EPA acceptable range.

All of the alternatives, except Alternative 1 (No Action), would protect local residents from contaminated soil contact and inhalation. Soil contaminant migration potential at the site would be essentially eliminated if the caps being proposed are designed, constructed, and maintained properly. If the cap should fail, to some degree, alternatives 3, 4, and 6 include the added protection of a leachate collection and liner system. However, the OU1 remedy provides for extraction and treatment of contaminated groundwater should any leachate be generated. In addition, alternatives 4, and 5 include S/S treatment of soil, which are hazardous by toxicity characteristic. S/S soil treatment adds some long-term reliability but increases the volume.

Alternatives 2, 3, 4, and 5 provide for the continued operation and monitoring of the existing cap. Alternatives 6 and 7 call for the excavation and removal of the contaminated material under the cap. The existing cap greatly reduces the amount of precipitation infiltration. Removing the cap and contaminated material will not increase overall

DRAFT

**Table 4-11**
**SUMMARY EVALUATION OF SITE-WIDE REMEDIAL ALTERNATIVES**



| Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/Industrial Development | Alternative 3 On-site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-site Hazardous and Subtitle D Landfills | Alternative 7 Soil S/S Treatment and Off-site Subtitle C and D Landfills |
|---|---|---|---|---|---|---|---|
| **OVERALL PROTECTION** | | | | | | | |
| Human Health Protection | | | | | | | |
| • Contact with contaminated soil | No reduction from present levels. | Land improvements prevent contact (exposure) with on-site soil by capping soil above target action levels and instituting land use restrictions. | On-site soil consolidation under multimedia cap prevents contact (exposure) with soil at or above target action levels. | See Alternative 3. | See Alternative 2. | See Alternative 3. | Soil above target action levels is removed from the site, eliminating long-term risk of exposure from this site while transferring to another. |
| • Contact with contaminated buildings | No reduction from present levels. | Building W would be demolished and disposed of in a manner protective of human health. Building E has been dismantled and is currently being stored on the site. | Building W would be demolished and disposed of in a manner protective of human health. Building E has been dismantled and is currently being stored on the site. | See Alternative 3. | See Alternative 3. | See Alternative 3. | See Alternative 3. |
| • Contact with contaminated sediments | No reduction from present levels. | Inspection of sewer would take place. On-site and off-site system would be cleaned. These activities would prevent long-term risk of exposure to contaminated sediments. | Same as Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. |
| Environmental Protection | | | | | | | |
| • Soil contaminant migration | No reduction in migration potential of contaminated soil from present levels. | Significantly reduces the migration potential of soil at or above target action levels by using various capping technologies. | Essentially eliminates the migration potential of contaminated soil by consolidating the on-site soil at or above the target action levels under an asphalt cap. Also has the added protection offered by a Subtitle C liner system. | Same as Alternative 3 except multimedia cap and protection offered by S/S treatment of soil that is hazardous determined by toxicity characteristic. | Essentially eliminates the migration potential of the on-site contaminated soil at or above target action levels by using various capping technologies in combination with in situ and ex situ S/S treatment. | See Alternative 3. | Eliminates the migration potential of the contaminated soil at or above target action levels at the site because the soil is removed from this site and transferred to another site. |

Table 4-11
SUMMARY EVALUATION OF SITE-WIDE REMEDIAL ALTERNATIVES



| Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/Industrial Development | Alternative 3 On-site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-site Hazardous and Subtitle D Landfills | Alternative 7 Soil S/S Treatment and Off-site Subtitle C and D Landfills |
|---|---|---|---|---|---|---|---|
| **COMPLIANCE WITH ARARS** | | | | | | | |
| Chemical-Specific ARARs | Does not meet any chemical-specific ARARs. | Soil and sediment risk-based action levels are used. | See Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. |
| Location-Specific ARARs | Not relevant. There are no location-specific ARARs. | See Alternative 1. | See Alternative 1. | See Alternative 1. | See Alternative 1. | See Alternative 1. | See Alternative 1. |
| Action-Specific ARARs | ARARs not applicable since no action occurs. | CAMU regulation would be complied with. | See Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. | LDRs would be complied with because soil determined to be bazardous would be treated prior to disposal. |
| **LONG-TERM EFFECTIVENESS AND PERFORMANCE** | | | | | | | |
| Magnitude of Residual Risk | | | | | | | |
| • Contact with contaminated soil | Source not remediated; risk remains. | Risk is significantly reduced as long as caps are maintained. | Risk is essentially eliminated if the caps are maintained. | See Alternative 3. | See Alternative 2. | See Alternative 3. | Onsite risk is eliminated due to removal of contaminated soil at or above target action levels and transfer to another site. |
| • Contact with contaminated buildings | Risk to on-site workers from contact with contaminated structures and continued contamination of soil beneath the structures remains. | Risk from on-site structures eliminated as Building W is demolished. | Risk from on-site structures eliminated as buildings are demolished and disposed of in on-site Subtitle C Landfill or stored for future disposal | See Alternative 3. | Same as Alternative 3. | See Alternative 3. | Same as Alternative 3 except disposal is in off-site Subtitle D landfill. |
| • Contact with contaminated sediments | Residual risk remains as sediments remain in system. | Sediments would be removed from system, thereby eliminating long-term risk. | See Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. |

Table 4-11
SUMMARY EVALUATION OF SITE-WIDE REMEDIAL ALTERNATIVES



| Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/Industrial Development | Alternative 3 On-site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-site Hazardous and Subtitle D Landfills | Alternative 7 Soil S/S Treatment and Off-site Subtitle C and D Landfills |
|---|---|---|---|---|---|---|---|
| Adequacy and Reliability of Controls | No controls over contamination. No reliability. | Caps adequately control migration potential of contaminated soil is properly designed, constructed, and maintained. Removal and proper disposal of structures and sediment adequately control associated risks.<br><br>Reliability of the caps can be high if maintained. Removal and disposal of structures and sediment are reliable control methods. | Same as Alternative 2 except hazardous soil liner system offers additional protection by essentially eliminating the migration potential of contaminants in the soil. | Same as Alternative 3 with the added protection offered by S/S treatment of the soil that is hazardous as determined by toxicity characteristic. | Reliability of S/S treatment to reduce migration potential of soil contaminants is enhanced by placement of the various caps. The caps must be maintained to remain effective and reliable.<br><br>Removal and disposal of structures and sediment are reliable control methods. | See Alternative 3. | Removal of contaminated soil at or above target action levels, structures, and sediment adequately control associated risks.<br><br>Removal and disposal of contaminated soil at or above target action levels, structures, and sediment are reliable control methods. |
| Need for 5-Year Review | Because contaminated materials remain onsite, review would be required to ensure adequate protection of human health and the environment is maintained. | See Alternative 1. | See Alternative 1. | See Alternative 1. | See Alternative 1. | See Alternative 1. | No review required. |
| **REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT** | | | | | | | |
| Treatment Process Used | None. | None. | None. | On-site soil at or above target action levels that exceeds the TC for arsenic would be treated by stabilization/solidification. | On-site soil that exceeds the target action levels would be treated by both in situ and ex situ stabilization/ solidification. | None. | See Alternative 4. |
| Amount Destroyed or Treated | None. | None. | None. | It is assumed that 5,700 $yd^3$ of soil and debris would be hazardous by toxicity characteristic. | 16,000 $yd^3$ of contaminated soil, which exceeds the target action levels. | None. | 13,800 $yd^3$ of contaminated material would be hazardous by toxicity characteristic. |

Table 4-11
SUMMARY EVALUATION OF SITE-WIDE REMEDIAL ALTERNATIVES



| Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/Industrial Development | Alternative 3 On-site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-site Hazardous and Subtitle D Landfills | Alternative 7 Soil S/S Treatment and Off-site Subtitle C and D Landfills |
|---|---|---|---|---|---|---|---|
| Reduction of Toxicity, Mobility, or Volume | None. | Reduces migration potential of contaminated soil and debris. Toxicity and volume remain unchanged. | See Alternative 2. | Volume of contaminated soil increases due to S/S treatment. Same as Alternative 2 plus reduces migration potential of hazardous soil and debris contaminants. | Volume of contaminated soil increases due to S/S treatment. Reduces migration potential of contaminated soil and debris, which exceeds the target action levels. | See Alternative 2. | See Alternative 4. |
| Irreversible Treatment | None. | None. | See Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. |
| Type and Quantity of Residuals Remaining after Treatment | None. | None. | None. | About 7,500 $yd^3$ of treated soil and debris containing arsenic remains on-site. | Approximately 24,000 $yd^3$ of ex situ and in situ S/S soil and debris containing arsenic remains on-site. | None. | None. |
| Statutory Preference for Treatment | Preference not met. | Preference not met. | Preference not met. | Preference met. | Preference met. | Preference not met. | Preference met. |

**Table 4-11**
**SUMMARY EVALUATION OF SITE-WIDE REMEDIAL ALTERNATIVES**



| Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/Industrial Development | Alternative 3 On-site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-site Hazardous and Subtitle D Landfills | Alternative 7 Soil S/S Treatment and Off-site Subtitle C and D Landfills |
|---|---|---|---|---|---|---|---|
| **SHORT-TERM EFFECTIVENESS** | | | | | | | |
| Community Protection | Remedy implementation does not add to risk. | Temporary increase in fugitive dust generation during soil remediation.<br><br>Estimated number of vehicular accidents based on number and length of truck trips is 0.3.<br><br>Estimated number of vehicular accidents involving injuries is 0.1.<br><br>About 3,300 $yd^3$ of debris would need to be moved on the site, but contaminated soil remains undisturbed. | Soil transport required on the site in order to consolidate in a Subtitle C Landfill.<br><br>Estimated number of vehicular accidents is 1.3. Estimated number of vehicular accidents involving injury is 0.6.<br><br>More dust generated during remediation than Alternative 2. | Same as Alternative 3; however, additional dust would be generated during the treatment of hazardous soil by S/S.<br><br>Estimated number of vehicular accidents is 1.7.<br><br>Estimated number of vehicular accidents involving injuries is 0.75. | About 9,400 $yd^3$ of soil and debris would be excavated and treated ex-situ, and a total of about 16,000 $yd^3$ would be treated using in situ S/S. This type of treatment can generate a significant amount of dust, which would have to be controlled.<br><br>Estimated number of vehicular accidents is 0.6. Estimated number of vehicular accidents involving injuries is 0.3. | A total of 25,000 $yd^3$ would be excavated.<br><br>Estimated number of vehicular accidents is 2.2. Estimated number of vehicular accidents involving injuries is 1. | All contaminated soil above target levels would be excavated and disposed of offsite. A total of about 25,000 $yd^3$ would be excavated. About 13,800 $yd^3$ would require S/S treatment. All these activities would generate fugitive dust emissions.<br><br>Estimated number of vehicular accidents is 5.0. Estimated number of vehicular accidents involving injuries is 2.3.<br><br>About 2,000 truck loads would be needed to transport the material to an offsite disposal site which would substantially increase the potential for traffic accidents. |

**Table 4-11**
**SUMMARY EVALUATION OF SITE-WIDE REMEDIAL ALTERNATIVES**



| Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/Industrial Development | Alternative 3 On-site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-site Hazardous and Subtitle D Landfills | Alternative 7 Soil S/S Treatment and Off-site Subtitle C and D Landfills |
|---|---|---|---|---|---|---|---|
| Worker Protection | Current risk would remain and possibly worsen over time. | Protection required against dermal contact and dust inhalation of contaminated soil during debris excavation, cap construction, and building decontamination and demolition. Subchronic hazard index equals 2.7. Excess cancer risk equals $2x10^{-6}$. | Same as Alternative 2 except an additional 16,900 $yd^3$ of contaminated soil would be excavated. Subchronic hazard index equals 4.3. Excess cancer risk equals $2x10^{-5}$. | About 5,700 $yd^3$ require treatment by S/S. This type of treatment can generate dust, and therefore, worker protection around the treatment site would be required. Subchronic hazard index equals 4.3. Excess cancer risk equals $3x10^{-5}$.<br><br>Short-term risk exceeds long-term risk. | Protection required against dermal contact and dust inhalation of contaminated soil during excavation and in-situ S/S treatment. In situ treatment can generate as much and possibly more dust than excavation. The treatment process would require strict controls to minimize dust generation. Subchronic hazard index equals 4.3. Excess cancer risk equals $4x10^{-5}$.<br><br>Short-term risk exceeds long-term risk. | Protection required against dermal contact and dust inhalation of contaminated soil during excavation and soil treatment. 25,000 $yd^3$ requiring excavation. Subchronic hazard index equals 5.5. Excess cancer risk equals $8x10^{-5}$.<br><br>Short-term risk exceeds long-term risk. | Protection required against dermal contact and dust inhalation of contaminated soil during excavation activities, S/S treatment activities, and building demolition. A significant amount of truck traffic would be required; therefore, traffic patterns would need to be established in order to reduce the likelihood of accidents. Subchronic hazard index equals 6.6. Excess cancer risk equals $2x10^{-4}$.<br><br>Short-term risk outside EPA's acceptable range. |
| Environmental Impacts | Current impacts would remain and would likely worsen. | Dust generated by construction activities may spread contamination if not controlled. | Similar to Alternative 2 except that there is a higher likelihood of spreading contamination, due to dust generation, because an additional 13,600 $yd^3$ of soil requires excavation. | Higher impacts than Alternative 3 due to dust generated. | The in situ treatment process minimizes excavation; however, the process has the potential for generating a significant amount of dust if not controlled. | See Alternative 3; however, 25,000 $yd^3$ of material is excavated. | Similar to Alternative 6 in terms of on-site impacts. However, a significant amount of soil would be transported offsite, which would increase the potential for accidents and spills. |
| Time Until Action is Complete | Not applicable. | This alternative would take about 5 months to construct after all construction contractors are issued start work notifications. | This alternative would take about 6 months to construct after all construction contractors are issued start work notifications. | Construction would take about 7 months to complete after all construction contractors are issued start work notifications. | Construction would take about 8 months to complete after all construction contractors are issued start work notifications. | Construction would take about 8 months to complete after all construction contractors are issued start work notifications. | This alternative would take about 9 months to construct after all construction contractors are issued start work notifications. |

Table 4-11
SUMMARY EVALUATION OF SITE-WIDE REMEDIAL ALTERNATIVES



| Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/Industrial Development | Alternative 3 On-site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-site Hazardous and Subtitle D Landfills | Alternative 7 Soil S/S Treatment and Off-site Subtitle C and D Landfills |
|---|---|---|---|---|---|---|---|
| **IMPLEMENTABILITY** | | | | | | | |
| Ability to Construct and Operate | Not applicable. | Routine construction activities. Caps require maintenance. | Standard construction activities would be performed. Maintenance would be required for the landfill. | Several contractors are available to perform S/S treatment. All other components are similar to Alternative 3. | In situ S/S relatively standard treatment technology. Several contractors are available to perform in both ex situ and in situ S/S. Contamination at 5-foot to 8-foot depth would be more difficult to treat than surficial contamination. Buried utilities will make implementation more difficult. Other components of this alternative are similar to Alternative 3. | See Alternative 3. | This alternative is similar to Alternative 4; however, all the contaminated soil at or above the target action levels is transported off-site. If truck transport is used, a significant amount of attention would need to be given to this activity to create the least disruption to the local community. |
| Ease of Doing More Action if Needed | Not applicable. | After caps and landfill are in place, modification would be difficult and disruptive. | Additional excavation may be difficult depending on depth or location. After the landfill is in place, modification would be difficult and disruptive. | Additional excavation may be difficult, depending on depth or location. Treatment system can handle additional volume. Remaining components are similar to Alternative 3. | Very difficult to manage treated soil after it has cured. Other components are the same as Alternative 2. | See Alternative 3. | Additional excavation may be difficult, depending on depth or location. |
| Ability to Monitor Effectiveness | Not applicable. | This alternative can be monitored easily in order to assess the effectiveness of the remediation. | See Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. | See Alternative 2. |
| Ability to Obtain Approvals and Coordinate with other Agencies | Not applicable. | None needed. | Local zoning requirements will need to be complied with to construct a landfill on the site. | Same as Alternative 3. | See Alternative 3. | See Alternative 3 | None. |

**Table 4-11**
**SUMMARY EVALUATION OF SITE-WIDE REMEDIAL ALTERNATIVES**



| Criteria | Alternative 1 No Action | Alternative 2 Land Improvements for Commercial/Industrial Development | Alternative 3 On-site Subtitle C Landfill | Alternative 4 S/S Treatment of Hazardous Soil and On-site Subtitle C Landfill | Alternative 5 In Situ S/S Treatment | Alternative 6 On-site Hazardous and Subtitle D Landfills | Alternative 7 Soil S/S Treatment and Off-site Subtitle C and D Landfills |
|---|---|---|---|---|---|---|---|
| Availability of Services, Capacities, Equipment, Specialists, and Materials | Not applicable. | Standard construction activities. Services and capacities widely available. Materials available in proximity to the site. | Standard construction activities. Services and capacities widely available. Materials available in proximity to the site. | Many S/S vendors available. Other activities are standard. Services and capacities widely available. Materials available in proximity to site. | Several S/S vendors have in situ capabilities. Other activities are standard. Services and capacities widely available. Other materials available in proximity to site. | See Alternative 3. | Many S/S vendors available. Landfill capacities are available within 300 miles of the site. Other activities are standard. Services and capacities widely available. Materials available in proximity to site. |
| **Cost** | | | | | | | |
| Capital Cost | 0 | $2,930,000 | $4,450,000 | $8,100,000 | $11,900,000 | $5,700,000 | $27,800,000 |
| First-Year Annual O&M Cost | 0 | $31,000 | $66,000 | $66,000 | $58,000 | $85,000 | $16,000 |
| Total Present Worth of O&M | 0 | 1,270,000 | 821,000 | 821,000 | 722,000 | 498,000 | 200,000 |
| Present-Worth Cost | 0 | $4,200,000 | $5,300,000 | $8,900,000 | $12,600,000 | $6,200,000 | $28,000,000 |

Note: Treatment of groundwater will occur as part of the OU1 remedy, reducing overall site risk.

protection of human health and the environment. Removing the cap-material would increase the short-term risk to the community.

Risk associated with buildings E and W would be eliminated through demolition, storage and disposal. All alternatives, except Alternative 1, include building demolition as a component.

The risks associated with the stormwater system and the associated sediments would be reduced through cleaning and removing the sediments if necessary. All of the alternatives, except Alternative 1, address the stormwater system using this method.

## Compliance with ARARs

The evaluation of the ability of the alternatives to comply with ARARs included a review of chemical-specific and action-specific ARARs that were presented earlier in the report. There are no known location-specific ARARs for the site.

Local zone requirements, if applicable, may be required for alternatives 3, 4, and 6 because either a Subtitle C or Subtitle D landfill is proposed. Restrictive covenants would be needed for Alternatives 2, 3, 4, 5, and 6 consistent with the Georgia Hazardous Site Response Act.

## Long-Term Effectiveness and Permanence

All alternatives provide long-term effectiveness to the site if the caps being proposed are designed, constructed, and maintained properly. Alternative 7 may transfer the long-term environmental problems to another site and is the least preferred alternative under the statute. Alternative 4 provides higher degrees of long-term protection of contaminant migration because both S/S treatment and disposal in a Subtitle C landfill are proposed. Alternatives 3, 5, and 6 are next because the alternatives use disposal in a Subtitle C

DRAFT

landfill or combines S/S treatment and capping. The reduction of contaminant migration potential is assessed under the first criterion. Alternatives 2 through 6 leave both treated and untreated soil at the site, and therefore, long-term effectiveness would be dependent on long-term operation and maintenance of the containment components.

Building demolition and stormwater system improvements would protect long term through removal of all contaminated materials. These actions would remove all risks associated with the structures and stormwater system for each alternative.

## Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternatives 4, 5, and 7 use S/S treatment technology to reduce the mobility but not the toxicity of on-site soil and debris contamination. S/S treatment technology increases the volume of waste approximately 25 percent. Alternative 4 has an estimated 5,700 cubic yards of soil to treat. The volume of treated material would be roughly 7,200 cubic yards, which results in a volume increase of about at least 1,500 cubic yards. Alternative 5, in situ treatment, would require excavation of about 9,400 cubic yards of soil and debris to account for the volume increase and to match existing grades. Because the existing cap would be excavated, Alternative 7 has an estimated 13,800 cubic yards to treat. The volume of treated material would be roughly 17,300 cubic yards, which results in an increase of about 3,500 cubic yards. Alternative 5 provides treatment of all on-site soil contaminated at or above target action levels using a combination of ex situ and in situ techniques.

Alternatives 2, 3, and 6 do not use treatment technologies for the contaminated on-site soil and debris and, therefore, do not increase soil volumes. However, the potential for contaminant migration is reduced significantly by either covering or landfilling the soil contaminated at or above proposed target action levels.

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## Short-Term Effectiveness

Short-term effectiveness would be affected by excavation activity and heavy equipment required for transport and construction. All alternatives require some excavation of on-site soil. Alternative 2 would require the least excavation of on-site soil. Alternatives 4 and 5 would require handling of hazardous soil during treatment activities. Alternatives 6 and 7 would require the most handling of hazardous materials due to excavation of the existing cap. Construction of caps and landfills would be required for all alternatives except for Alternative 7. The work and associated equipment will generate dust, noise, and exhaust. Activities that might generate dust (excavation, building demolition, in situ treatment, etc.) would use controls to minimize fugitive dust emissions. Workers during remedial activities would wear PPE.

Alternatives 3 through 7 would have similar effects on on-site workers. Alternative 2, because it requires the least amount of site disturbance would be the least disruptive to current site operations. Short-term risks are greater than the long-term risks for Alternatives 3 through 7. Short-term risks are greater than the acceptable risk range for Alternative 7.

Alternatives 2, 3, 4, 5, and 7 could have potential negative effects on the local residents near the site. Alternative 2 would have the least potential for negative effects because the lowest amount of soil is being excavated followed by Alternative 3.

## Implementability

All Alternatives would consist of standard construction activities (caps, excavation, landfills, demolition). The materials required for capping are readily available. Long-term maintenance of cap areas would be required.

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In addition, Alternatives 4, 5, and 7 require S/S treatment of soil. S/S is a standard technology. Several contractors are available to provide this service. Additional treatability work may be required to optimize the reagent mix ratio for the waste. In situ treatment is also performed by several vendors. Alternative 5 uses in situ S/S treatment which could interfere with on-site utilities.

Variances from state and local regulations may be required for construction of a landfill at the site. This would affect all alternatives except alternatives 2 and 7. These variances and zoning approval are assessed under the compliance with ARARs criterion.

## Cost

Table 4-11 presents a comparative cost summary of all seven alternatives.

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# Appendix A
# Soil and Sediment Action Levels for the Chemicals of Concern at the Woolfolk Chemical Works Site

# Soil and Sediment Action Levels for the Chemicals of Concern at the Woolfolk Chemicals Works Site

August 1, 1994

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## 1.0 Introduction

Since 1978, the standards for clean-up of chemical spills and discharges have been established at the EPA regional office level. Through guidelines developed at this level, the extent of clean-up required in specific instances has been established on a case-by-case basis. Soil clean-up policy recognizes the fact that the potential for human exposure and consequent potential health risks varies with the location of the spill. As such, the policy contains different soil action levels depending upon the spill location, the potential for continuing exposure to residual chemicals remaining following clean-up, the concentrations initially spilled, and the size and characteristics of the population at risk of exposure. Briefly, soil and sediment action levels are derived by determining what concentration can remain in the soil environment that will result in acceptable risks to human health or the environment. Since risk is a function of toxicity times exposure [i.e., $R \approx T$ ¶(E)], an acceptable soil action level may be derived by setting an acceptable risk level (e.g., $1 \times 10^{-4}$ to $1 \times 10^{-6}$), determining the extent of human exposure to soil (in mg of soil per day) and then solving for the concentration of chemical that can remain in site soils. In this report, Industrial Compliance (IC) used USEPA cancer slope factors and reference doses (RfDs) to set the acceptable doses of chemicals in soil and sediment.

### 1.1 Objective

The goal of this assessment is to calculate risk-based soil and sediment action levels for the chemicals of concern present in these environmental media at the Woolfolk site. Action levels are based on the noncarcinogenic effects and carcinogenic risks associated with the chemicals and the degree of exposure which may be experienced by exposed persons. In the case of noncarcinogenic chemicals, action levels for chemicals in soil or sediment are calculated to protect those potentially exposed from the occurrence of toxic effects. For potentially carcinogenic chemicals, action levels are designed to protect exposed persons at a prescribed range of allowable lifetime cancer risk ranging from one in ten thousand to one in one million.

Soil action levels are based on soil exposures possibly experienced by an adult and child in a residential exposure setting and for workers exposed to soil in

the workplace. For both the residents and workers, soil action levels are derived based on "reasonable maximum exposure" conditions. Sediment action levels for the chemicals of concern are based on a child's possible exposure to sediment while at play. Like action levels calculated for the chemicals of concern in soil, action levels for sediment are based on the reasonable maximum exposure case condition.

This report is not intended as a stand-alone document. For information concerning the selection of chemicals of concern, description of sampling data, and exposure assumptions, the reader is refered to the Draft Baseline Risk Assessment of the Woolfolk Chemical Works Site prepared by Industrial Compliance in November 1992.

## 2.0 Methods for Calculating Action Levels for Soil and Sediment

### 2.1 Calculation of Human Intake Factors for Soil and Sediment

Exposure equations and assumptions used to calculate soil, sediment, and groundwater action levels are presented in Tables 3-4 through 3-9 of Section 3.4 of the Baseline Risk Assessment of the Woolfolk Chemical Works Site. EPA-derived chronic reference doses (RfDs) were used to calculate soil action levels based on the noncarcinogenic effects of the chemicals of concern for subchronic exposures (children only) and chronic exposures (adults and workers). EPA-derived slope factors for potentially carcinogenic chemicals of concern were used to derive soil action levels based on the $1 \times 10^{-4}$, $1 \times 10^{-5}$, and $1 \times 10^{-6}$ lifetime cancer risk levels. Slope factors and RfDs used in calculating soil action levels were taken from Tables 4-1 and 4-2 of the Final Baseline Risk Assessment report.

In order to calculate action levels for soil and sediment, human intake factors (HIF) must first be calculated. HIFs represent the amount of soil and sediment containing the absorbed amount of chemical. The HIF values were calculated by adapting the equations from Section 3.4 of the Baseline Risk Assessment. Modifications of the equations presented in Table 3-4 of the Baseline Risk Assessment are required to calculate HIFs. For all pathways of exposure: (1) the concentration term ("CS" for soil and sediment) is omitted from the ingestion, dermal, and inhalation equations presented in Table 3-4;

(2) for the ingestion route of exposure, the exposure equation is multiplied by a chemical-specific oral absorption factor (presented in Table 4-3 of the Baseline Risk Assessment) to allow summing oral and dermal HIFs. As calculated in the Baseline Risk Assessment, dermal intakes are calculated as absorbed doses.

With the exception of arsenic inhaled as particulate, inhalation HIFs are not adjusted for absorption. The inhalation HIF for arsenic is multiplied by 0.3 because the inhalation slope factor for arsenic is derived by the EPA by assuming that 30% of inhaled arsenic will be absorbed.

HIFs are calculated in terms of kg of soil or sediment intake/kg of body weight/day for each route of soil exposure. HIFs for the ingestion, dermal, and inhalation exposure pathways are abbreviated as $HIF_{ingestion}$, $HIF_{dermal}$, and $HIF_{inhalation}$, respectively.

**2.2 Calculation of Risk-Based Action Levels for Soil and Sediment**

Once HIFs have been calculated for the ingestion, dermal, and inhalation pathways of exposure, action levels based on noncarcinogenic or carcinogenic risk may be calculated. For certain chemicals such as arsenic, action levels may be based on noncarcinogenic and carcinogenic risk.

Action levels for potentially carcinogenic chemicals are calculated from the derived HIFs and the slope factor. The slope factor is a quantitative estimate of the carcinogenic potency of a potential carcinogen derived by the EPA. Slope factors used to derive action levels for the chemicals of concern in soil and sediment are presented in Tables 4-1 and 4-2 of the Draft Baseline Risk Assessment. Since HIFs for the ingestion and dermal exposure pathways calculate the amount of soil, sediment, or groundwater containing the absorbed dose of the chemical of concern, the oral slope factor must be adjusted to reflect the risk associated with the absorbed dose. To perform this adjustmen, the oral slope factor for a chemical of concern is divided by its oral absorption factor as presented in Table 4-3 of the Draft Baseline Risk Assessment. Although the EPA does not derive dermal slope factors, the risk posed by absorption of chemicals through the skin is accounted for in the

development of soil and sediment action levels by the use of the adjusted oral slope factor. Inhalation slope factors are not adjusted and are used as presented in Table 4-1 of the Draft Baseline Risk Assessment.

Action levels for potential carcinogens are calculated for added lifetime cancer risk levels of 1 in 10,000 (1 E-04 or $1 \times 10^{-4}$), 1 in 100,000 (1 E-05 or $1 \times 10^{-5}$), and 1 in 1,000,000 (1 E-06 or $1 \times 10^{-6}$). These risk levels correspond to the EPA target risk range for potential carcinogens (i.e., $1 \times 10^{-4}$ to $1 \times 10^{-6}$).

The equation used to calculate action levels for potential carcinogens is presented below.
Soil Action Level for potential carcinogens (for soil and sediment, mg chemical/kg soil) =

$$\frac{\text{Target Risk Level}}{((HIF_{ingestion} + HIF_{dermal}) \times \text{*oral slope factor}) + (HIF_{inhalation} \times \text{inhalation slope factor})}$$

where :

Target Risk Level represents the selected level of added lifetime cancer risk posed by the chemical of concern i.e., $1 \times 10^{-4}$, $1 \times 10^{-5}$, or $1 \times 10^{-6}$ (unitless )
HIF is the human intake factor for soil or sediment for the specified route of exposure (kg soil or sediment/kg body weight/day
Slope factor is an EPA-derived factor for the oral or inhalation route of exposure based on the carcinogenic potency of the chemical of concern ((mg chemical/kg body weight/day)$^{-1}$). *The oral slope factor is adjusted for absorption as described in the text.

Certain chemicals of concern have slope factors for either the oral or inhalation route but not for both. In these cases, action levels for soil, sediment, and groundwater are based on routes of exposure for which there is an identifiable oral or inhalation slope factor. For example, no inhalation slope factor has been derived for 4,4'-DDD. For this reason, soil action levels based on the possible carcinogenicity of 4,4'-DDD consider only the risks associated with ingestion and dermal contact with soil.

Action levels based on the noncarcinogenic effects of the chemicals of concern are calculated from the HIF as an index of exposure and the reference dose as an indicator of the toxicity of a chemical. The reference dose is defined by the EPA as "an estimate (with uncertainty spanning perhaps an order of magnitude) of the daily exposure to human population (including sensitive

subgroups) that is likely to be without an appreciable risk of deleterious effects during a portion of the lifetime, in the case of a subchronic RfD or during a lifetime, in the case of a chronic RfD." Thus, action levels derived for the chemicals of concern in soil and sediment will allow chemical intakes equal to the dose considered to be "without an appreciable risk of (noncarcinogenic) deleterious effects", i.e., an intake equal to the reference dose.

Oral reference doses are adjusted for absorption to reflect the calculation of absorbed HIFs. The oral reference dose is multiplied by the chemical-specific absorption factor presented in Table 4-3 of the Draft Baseline Risk Assessment to account for the use of absorbed doses rather than intakes.

The equation used to calculate soil action levels for the chemicals of concern based on the noncarcinogenic effects is presented below.

Soil Action Level based on noncarcinogenic effects =

$$\frac{1}{\frac{HIFingest + HIF_{dermal}}{*RfDoral} + \frac{HIFinhalation}{RfDinhalation}}$$

where:

HIF is the human intake factor for soil or sediment for the specified route of exposure (kg soil or sediment/kg body weight/day)
RfD is the EPA-derived chronic reference dose for the chemical of concern by the oral or inhalation route of exposure (mg/kg/day).
*The oral RfD is adjusted for absorption as described in the text.

Certain chemicals have an RfD for either the oral or inhalation route of exposure but not both. For these chemicals, soil action levels are calculated using only routes of exposure for which there are EPA-derived RfDs.

### 2.2.1 Calculation of Soil Action Levels

Risk-based soil action levels for potentially carcinogenic and noncarcinogenic chemicals of concern were calculated according to the methods outlined above for a worker and adult and child resident.

To assess possible inhalation exposure to soil particulate containing the chemicals of concern, it was assumed that the total suspended dust concentration was 0.13 $mg/m^3$. This was the highest concentration of total suspended particulate detected during three rounds of air samples at the Woolfolk site collected in May and June 1992. Further, all particulate in air was assumed to be composed of affected soil.

Individuals may also inhale chemicals which volatilize from soil. More volatile chemicals such as trichloroethene and 1,2-dichloroethane are readily released from soil and may contribute to overall exposure. However, owing to their high volatility, surface soil is unlikely to serve as a long-term source of exposure to these chemicals since concentrations of these chemicals in soil will rapidly decrease with time. It is difficult to account for the high volatility of these chemicals in long-term exposure estimates. For this reason, soil action levels for chemicals in surface soil reflect only inhalation of chemicals present in soil particulate and not a vapor phase component.

It is also important to note that with the exception of tetrachloroethene (which was detected in a single surface soil sample at 0.080 mg/kg), no potentially carcinogenic volatile chemicals were detected at concentrations above 0.010 mg/kg in surface soil. The highest concentration of any volatile chemical detected in surface soil was 0.69 mg/kg for xylene.

For the on-site worker, soil action levels based on noncarcinogenic and potential carcinogenic effects of the chemicals of concern are presented in Tables 1 and 2, respectively. Soil action levels for the off-site residential exposure scenario are presented in Tables 3 and 4 for the adult and Tables 5 and 6 for the child. The calculated action levels in these tables under the average and RME case for both cancer and non-cancer effects are presented as a range of potential soil action levels.

Soil action levels were not calculated for lead. The Office of Solid Waste and Emergency Response of the USEPA has specified an interim soil lead action level range of 500 to 1000 ppm (OSWER Directive #9355.4-02).

### 2.2.2 Calculation of Sediment Action Levels

Risk-based sediment action levels were calculated for a child at play. Unlike exposure to soil, inhalation exposure to chemicals of concern in sediment was not assessed since sediments are unlikely to become airborne.

Sediment action levels for the child at play are presented in Tables 7 (based on noncarcinogenic effects) and 8 (based on potential carcinogenic effects).

## 3.0 Calculation of Soil Action Level(s) for Arsenic

Although soil action levels have been calculated for various pesticides and organic chemicals detected in soil and sediment at the Woolfolk site in Tables 1 through 8, the most important of these is arsenic. As noted in the baseline risk assessment for the Woolfolk site, most of the calculated noncarcinogenic and carcinogenic risk can be attributed to arsenic. Given its importance as a site contaminant, IC has critically examined the assumptions used in deriving soil and sediment action levels for arsenic. This evaluation includes an assessment of the 30 mg/kg residential soil action level for arsenic developed by the EPA.

EPA has established an action level of 30 mg/kg for the Woolfolk Chemical Works site. A 30 mg/kg action level is highly conservative and action levels above 30 mg/kg are also protective of human health. A discussion of why action levels above 30 mg/kg are protective of human health is presented below.

### 3.1 Bioavailability Of Arsenic In Ingested Soil

Potential exposure risks from arsenic in soil are assumed by the EPA to be due to incidental soil ingestion. Children less than 6 years of age are assumed by the EPA to be the population at greatest risk of soil ingestion. The EPA uses theoretical risk default calculations using the reference dose (RfD) according to the following formula to obtain an arsenic action level:

$$\text{Soil Action Level} = \frac{\text{RfD} \times \frac{\text{bioavailability}_{\text{water}}}{\text{bioavailability}_{\text{soil}}} \times \text{body weight}}{\text{soil ingestion} \times \text{exposure duration} \times \text{conversion factor}}$$

Substitution of terms used by the EPA in this formula gives an action level of approximately 30 mg/kg as follows:

$$30\ \text{mg/kg} = \frac{0.0003\ \text{mg/kg/day} \times \frac{1}{0.8} \times 15\ \text{kg}}{200\ \text{mg/day} \times \frac{350\ \text{days/yr}}{365\ \text{days/yr}} \times 1\text{E-6 kg/mg}}$$

We will comment below on the conservatism in using an RfD of 0.0003 and a soil ingestion rate of 200 mg/day. In addition, recent evidence indicates that the bioavailability of arsenic in ingested soil (i.e., the amount that is absorbed into the body) is much less than the 80% assumed in the above calculations. The reason for the decreased bioavailability is that arsenic in soil may be in insoluble forms and/or bound to other substances in the soil which interferes with absorption into the blood stream. Unabsorbed arsenic in these forms is then excreted in the feces with little toxicologic effect.

Freeman et al. (1993) published results of a study which examined the bioavailability of arsenic in laboratory animals. In this study, rabbits were administered arsenic by three different methods:

1. Sodium arsenate given intravenously,
2. Sodium arsenate given in solution through oral gavage, and
3. Sodium arsenate in soil given orally in a capsular form.

The percent bioavailability was determined by comparing the orally administered arsenic forms to the intravenously administered arsenic. It was assumed that intravenous arsenic would represent 100% bioavailability (i.e., the entire dose of arsenic is present in the bloodstream). The investigators found that "the relative oral bioavailabilities of As in the gavage and test soil groups based on comparison with excreta data from the intravenous group were approximately 50 $\pm$ 5.7 and 24 $\pm$ 3.2% respectively."

Rabbits are considered an appropriate laboratory animal for studying arsenic since their metabolism of arsenic most closely resembles that of humans. However, Freeman et al. (1993) also studied the bioavailability of arsenic in soil in monkeys using similar experimental methods. The rationale of this study was that the monkey has more physiological and anatomical similarity to humans. Results from such a study would be useful in confirming the rabbit data.

The investigators found that for rabbits the percent bioavailability of gavage sodium arsenate and arsenic in oral administered soil was 36.9 and 25.9%, respectively. For monkeys, the percent bioavailability for gavage and soil sodium arsenate was 55.5 and 24.2%, respectively.

These studies indicate that approximately one-half of arsenic in an orally administered sodium arsenate solution is absorbed. Further, when arsenic is administered through ingested soil, only <u>one-quarter</u> (25.0%) of the total amount of arsenic that is ingested is actually absorbed. Substitution of the experimental bioavailability value into the formula which was used to calculate the EPA soil action level yields an arsenic soil action level of 90 mg/kg as shown below:

$$90\ \text{mg/kg} = \frac{0.0003\ \text{mg/kg/day} \times \frac{1}{0.25} \times 15\ \text{kg}}{200\ \text{mg/day} \times 1\text{E-}6\ \text{kg/mg}}$$

As shown, the 90 mg/kg action level is calculated using the RfD of 0.0003 and the soil ingestion rate of 200 mg/kg/day but accounts for differences in arsenic's bioavailability in water versus soil. It is well known in the scientific community that soil decreases the bioavailability of many chemicals. For example, in establishing soil cleanup levels for polychlorinated dibenzodioxins/furans and polycyclic aromatic hydrocarbons the EPA considers the bioavailability of these chemicals in soil when establishing risk based cleanup goals. Substituting the bioavailability of a chemical into the EPA theoretical default risk equations is common practice when there is good scientific data concerning the bioavailability of the chemical in question.

These new studies have been peer reviewed and as such IC believes that these new bioavailability studies should be used to develop an arsenic action level.

### 3.2 Epidemiologic Studies

A soil action level based on the RfD necessarily requires a number of theoretical assumptions in estimating exposure risks. Epidemiologic studies in which investigators have correlated arsenic soil concentrations with actual exposure as measured by arsenic urinary concentrations, suggest that risk calculations are significantly overestimated. The reasons for this overestimation are most likely due to:

- An overestimation of soil ingestion rates and/or
- An overestimation of bioavailability of arsenic in soil.

The results of studies which have been published in the scientific literature as well as our own experiences are shown below.

IC has recently examined arsenic exposure among SureCo workers at the Woolfolk site (IC, 1993). The average surface soil concentration on site was 721 mg/kg (range 1-18,000 mg/kg). Risk assessment calculations using an adult worker scenario suggested an increased exposure risk, primarily from incidental soil ingestion. All on-site workers (40) participated in the study. Random and 24-hour urine samples from the 40 workers were tested for total arsenic. Both the arithmetic and geometric average urine As concentrations were below 12 μg/L (range <1-57 μg/L). A normal urinary As concentration in the general population is usually regarded as anything less than 100 μg/L (ATSDR, 1991). Based on these results, IC was able to conclude that workers at the site were not receiving significant arsenic exposures despite the elevated soil arsenic levels.

Kalman et al. (1990) examined arsenic exposure among residents living near a former copper smelter in Tacoma, Washington. All age groups were represented in this study. There were 435 participants and approximately 3000 urine samples were collected on a quarterly basis for analysis. Speciated urinary arsenic levels were measured to adjust for the potential effect of

dietary influences, particularly from seafood, on urine arsenic concentrations. Results of this study are shown in the following table.

| Community | Mean soil concentration (mg/kg) | Mean urinary arsenic concentration (μg/L) |
|---|---|---|
| Ruston | 353 | 19.6 |
| Tacoma/control | 57 | 9.2 |
| Bellingham | 7 | 9.6 |
| Tacoma + Bellingham (children 0-6 years of age | 7-57 | 11.3 |

As shown in the table, mean urinary arsenic for the three communities were within normal ranges. It is of interest to note that the Tacoma and Bellingham populations had almost identical mean urinary arsenic concentrations despite having mean environmental arsenic soil concentrations of 57 and 7 mg/kg, respectively. This suggests that there is no difference in arsenic exposure potential at these two soil concentrations. Urine arsenic levels in these two communities are most likely a reflection of normal background levels and usual dietary sources of arsenic.

The investigators of this study considered exposure potentials in Tacoma and Bellingham equivalent and combined the study results for these two communities to compare them with Ruston when examining the effects of gender and age on arsenic exposure. There was little difference in urinary arsenic concentrations for young children when compared to adults.

Dr. Suzanne Binder (1987, 1988) with the Centers for Disease Control, has evaluated arsenic exposure among children age 2-6 living near a former copper smelter in Anaconda, Montana. This is considered by EPA to be the age group most at risk of arsenic exposure from soil ingestion. A total of 232 children participated in this study. Urine samples were collected in March and July to see if there were any seasonal differences in exposure. Samples were measured for total urinary arsenic. There was not a significant

difference in urine arsenic values for the two collection periods. Results from the July collection period are shown in the following table.

| Community | Mean soil concentration (mg/kg) | Mean urinary arsenic concentration (µg/L) |
|---|---|---|
| Mill Creek | 640 | 54 |
| Anaconda | 127 | 17.7 |
| Opportunity | 113 | 15.3 |
| Livingston | 44 | 16.6 |

Because total urinary arsenic was reported, the urinary arsenic levels are slightly higher than those reported by Kalman and in all probability are not significantly different from the urine arsenic levels which were reported for the Tacoma and Bellingham children (11.8 µg/L). It is of interest to note that Livingston was selected as a control community. The normal average background concentration of arsenic in this community was reported as 44 mg/kg which is 1.5 times the EPA residential soil action level.

The investigators of this study found that the urine arsenic concentrations (i.e., measure of arsenic exposure) for Anaconda, Opportunity, and Livingston were not significantly different. They concluded:

- "Contrary to expectations, the children living in Anaconda did not have elevated urinary arsenic levels"
- "**mean** soil arsenic levels of about 100 ppm are not associated with excess exposure in young children" (emphasis added)
- an arsenic soil concentration of 100 ppm is a "No Epidemiologically Detectable Exposure Level" or NEDEL
- "Although there are uncertainties involved in using epidemiologic data to assess exposure, in Anaconda these uncertainties are less than those associated with modeling or extrapolation from previously studied populations. Action levels for remedial activities designed to minimize risk from exposure to arsenic-

contaminated soil should be based on available epidemiologic data as well as on models." (emphasis added)

The results of a second study of Anaconda-area children age 2-6 were recently presented at a scientific conference on arsenic (Hwang et al., 1993, Bornschein, 1993). The average soil arsenic concentration for the study population was 226 mg/kg. Urinary arsenic was measured in 209 children. The average urinary arsenic concentrations for total urinary arsenic and speciated urinary arsenic were 20 µg/L and 10 µg/L, respectively.

The urinary arsenic concentrations from this study are similar to those found in the Binder study despite the fact that the mean soil concentration of 226 mg/kg is approximately twice that in the Binder study. The speciated arsenic concentration of 10 µg/L is actually less than the speciated arsenic concentration reported by Kalman et al. for children of a similar age residing in an environment where the mean arsenic soil concentration ranged from 7-57.

The investigators found a very weak correlation of soil arsenic to urinary arsenic levels. In 2-6 year old children, urine arsenic increased about 1 µg/L for every 100 ppm increase in arsenic soil concentration. To put this in perspective, using the EPA default theoretical risk assumptions (same assumptions used to derive a 22.5 mg/kg action level), for every 100 ppm increase in soil arsenic, a 20 µg As/L increase in urinary arsenic concentration would be expected for a child age 2-6 according to the calculations below. This is a value twenty times higher than that found in the Anaconda study.

**Calculation of urinary arsenic concentration for a 2-6 year old child in an environment with a 100 ppm arsenic soil concentration**

soil ingestion rate = 200 mg/day
arsenic soil concentration = 100 mg/kg
urine output of child = 0.7 L/day
fraction of ingested arsenic excreted in urine = 0.70

**Intake** = (ingestion rate)(As soil concentration)(conversion factor)
= (200 mg ingested per day)(100 mg As/kg soil)(1E-6 kg/mg)
= 20 µg As/day

**Urinary As Concentration**

= (intake)(fraction of As excreted)/(24-hour urine output of child)
= (20 µg As)(0.70 excreted)/(0.7 L/day)
= 20 µg/L

In reviewing these epidemiologic studies, it is apparent that there is little difference in arsenic exposure (as measured by urinary arsenic) between children living in an environment with a soil concentration as low as 7 ppm and those living in an environment with a soil concentration of over 200 ppm. This indicates that risk estimates using theoretical assumptions for exposure are significantly overestimated. The most likely sources of this overestimation is overestimation of soil ingestion rates and/or overestimation of the bioavailability of arsenic in ingested soil.

## 4.0 Other Data Which Indicate An Action Level Above 30 Mg/Kg Are Protective of Human Health

### 4.1 Georgia EPD Reporting Requirements

In work with other sites, we note that the Georgia Environmental Protection Division reporting requirement for arsenic in soil is 41 mg/kg. Arsenic soil levels below this concentration are not considered to represent a threat to public health. The basis of this number is given below:

$$\text{Soil Action Level} = \frac{\text{RfD} \times \frac{\text{bioavailability}_{\text{water}}}{\text{bioavailability}_{\text{soil}}} \times \text{body weight}}{\text{soil ingestion} \times \text{conversion factor}}$$

$$41.5\ \text{mg/kg} = \frac{0.0008\ \text{mg/kg/day} \times \frac{1}{1} \times 15\ \text{kg}}{200\ \text{mg/day} \times 1\text{E-}6\ \text{kg/mg}}$$

Note that the upper limit of the RfD was used in the derivation of this number. Thus, there is precedent for the use of the higher RfD value.

### 4.2 Sewage Sludge Regulatory Guidelines

Regulatory guidelines for sewage sludge have also been developed. As published in the Federal Register Vol. 58 No. 32 Friday February 19, 1993 Part II Environmental Protection Agency (EPA) 40 CFR Part 257 et al. Standards for the Use or Disposal of Sewage Sludge; Final Rules:

> **§503.13 Pollution Limits**
>
> (3) If bulk sewage sludge is applied to a lawn or a home garden, the concentration of each pollutant in the sewage sludge shall not exceed the concentration for the pollutant in table 3 of §503.13.
>
> Table 3 of §503.13. - Pollutant Concentrations

| Pollutant | Monthly Average Concentrations (mg/kg) |
|---|---|
| Arsenic | 41 |

Evaluation of the risks posed by pollutants that may be present in sludge applied to land required the Agency (EPA) to consider human exposure through inhalation, direct ingestion of soil, through consumption of crops grown on this soil, among others. EPA also assessed the potential risk to human health through contamination of drinking water sources or surface water when sludge is disposed of on the land. EPA also evaluated the potential effects directly on crops, on cattle, on surface water aquatic species and wildlife. Note that EPA considers 41 mg/kg arsenic in sludge fully protective of human health to a child and to grow crops on for human consumption.

### 4.3 Arsenic Background Levels

Due to the widespread agricultural use of arsenical pesticides in the Southeastern U.S. (i.e., Georgia, Alabama, Mississippi, Louisiana, Arkansas, and Texas) for the production of cotton, peaches, rice, and other crops, it has

been estimated that there are millions of acres in these states in which the soil arsenic concentrations exceed 20 mg/kg (Chaney, 1993).

Within the U.S. it has been reported that "background arsenic concentrations in soil range from about 1 to 40 ppm" (ATSDR, 1991). We know of no epidemiologic studies or case reports in which an excess of arsenic-related health effects has occurred in communities at background levels.

The most recent U.S. EPA Record of Decision (ROD) regarding arsenic soil action levels was 230 ppm for residential soils for the Commencement Bay Nearshore/Tideflats Superfund Site in Tacoma Washington (June, 1993). The ROD stated the following:

> The arsenic action level of 230 ppm is based on reducing the additional potential skin cancer risk to no more than 5 in 10,000, within EPA's acceptable risk range for cancer causing chemicals.
>
> The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective.

**4.4 Soil Ingestion Rates**

In calculating a soil action level for arsenic, the EPA used a default soil ingestion rate of 200 mg/day. Recent studies of the ingestion of soil in young children suggest that this is an upper limit value for young children (Thompson and Burmaster, 1991; Calabrese et al., 1989). Recent studies conducted by Calabrese et al. (1989) and Thompson and Burmaster (1991) indicate that a typical soil intake for a young child is likely to be less than half of the EPA default soil intake. For example, Calabrese et al. determined that for a group of one- to four-year old children, median soil intake ranged from 9 to 40 mg per day, depending on the soil tracer used for analysis. Recent re-analysis of a study of soil ingestion in young children (Binder et al., 1986) by Thompson and Burmaster (1991) indicated that the median soil intake for children 1 to 3 years of age was 59 mg/day. The 90th percentile for soil ingestion in this study was 143 mg/day, indicating that only 10% of children aged 1 to 3 years would be expected to ingest more than 143 mg of soil per day.

These values are lower than the 200 mg/day default value recommended for use by the EPA. Use of a soil ingestion rate of 100 mg/day instead of 200 would result in a soil cleanup level of 60 mg/kg.

### 4.5 Uncertainties Associated with the Arsenic Reference Dose

As mentioned above, the EPA derived the 30 mg/kg cleanup goal by ensuring a child's exposure to soil would not be above the EPA reference dose for arsenic. This reference dose is based on the adverse health effects observed in a Taiwanese population exposed to arsenic in groundwater for up to 45 years (Tseng et al., 1968; Tseng, 1977). This population is noteworthy in that: (1) Several authors have noted that the Taiwanese studied consumed protein-deficient diets, a factor which appears to predispose humans to arsenic intoxication (EPA, 1988; Marcus and Rispin, 1988), (2) The residents were exposed to water soluble forms of arsenic in groundwater and not soil arsenic. It has been shown that water soluble forms of arsenic are more completely absorbed than less water soluble forms (Hindmarsh and McCurdy, 1986) and; (3) The study population is more representative of the effects associated with decades of arsenic intake.

The uncertainty surrounding the use of the Tseng studies is reflected in EPA commentary regarding the RfD. In the IRIS (Integrated Risk Information Service) database report for arsenic, the EPA has stated that:

> "NOTE: There was not a clear consensus among Agency scientists on the oral RfD. Applying the Agency's RfD methodology, strong scientific arguments can be made for various values within a factor of 2 or 3 of the currently recommended RfD value, i.e., 0.1 to 0.8 ug/kg/day. It should be noted, however, that the RfD methodology, by definition, yields a number with inherent uncertainty spanning perhaps an order of magnitude. New data that possibly impact on the recommended RfD for arsenic will be evaluated by the Work Group as it becomes available. **Risk managers should recognize the considerable flexibility afforded them in formulating regulatory decisions when uncertainty and lack of clear consensus are taken into account** (emphasis added)."

Thus, from EPA guidance provided in IRIS, there is considerable flexibility in how risk managers can apply the reference dose for arsenic. Although it could be argued that the low end of the arsenic RfD range could be applied (0.1 μg/kg/day), such a reference dose would result in the classification of normal

background intake of inorganic arsenic in the diet as toxic. If the higher range of the acceptable reference dose was used in calculating a cleanup goal (i.e., 0.8 μg/kg/day) the resulting cleanup level would be 80 mg/kg arsenic. Thus, there is an acceptable range of soil clean-up goals for arsenic within a factor of 2 or 3 of the 30 mg/kg level established by EPA.

### 4.6 Comparison Of Allowable Or Background Arsenic Intakes To A 30 Mg/Kg Action Level

Because arsenic is a natural component of the earth's crust, humans are unavoidably exposed to small amounts of arsenic on a daily basis. Food, drinking water, and other media (such as smoking) may serve as sources of arsenic exposure. The EPA has estimated that for an average adult, intakes of arsenic range from 18-70 μg/day. Thus, for a 70 kg adult, intake of arsenic from background sources leads to a dose of 0.3-1.0 μg/kg/day (the midpoint of the EPA reference dose range and a dose that is 3 times higher than the reference dose). For a 16 kg child, arsenic intake from background sources would be 0.6-4.3 μg/kg/day. Thus, intake of arsenic in the diet would lead to intakes that were at or above the reference dose used by EPA. Indeed, at the above levels of intake, arsenic may serve as an essential nutrient (EPA, 1988). For this reason arsenic intakes somewhat above the upper limit of the reference dose range (up to 0.8 μg/kg/day) may form a more appropriate basis for developing a cleanup goal.

Arsenic intakes allowed under the current EPA drinking water standard are inconsistent with the 30 mg/kg cleanup levels established by the EPA. For example, the current EPA maximum contaminant level (MCL) for arsenic in drinking water is 50 μg/L. The maximum contaminant level goal (MCLG) proposed for arsenic is 50 μg/L (IRIS, 1993). The EPA has stated the following concerning the health protectiveness of the MCL and the MCLG.

> "MCLGs are based entirely on health considerations and do not take cost or feasibility into account. Moreover, as health goals MCLGs are set at levels where no known or anticipated health effects may occur, including an adequate margin of safety. MCLs are required to be set as close as feasible to the respective MCLs, taking into consideration the best technology, treatment techniques, and other factors (including cost). However, as the standard for public water supplies, MCLs are fully protective of human health and (for carcinogens) fall within the acceptable risk range of $10^{-4}$ to $10^{-7}$. Furthermore, for non-carcinogens, which are the majority of

> contaminants, MCLs will nearly always be set at the same level as the respective MCLGs. Also, these standards assure that even sensitive populations will experience no adverse health effects. Thus, there will be no difference in the protectiveness of MCLGs and MCLs, and, as discussed above, MCLs provide a sufficient level of protectiveness even for carcinogens." (52 FR 32499).

Therefore, by EPA definition, MCLs are considered to fully protect human health. If a 10 kg child were to ingest 1 liter of drinking water (as assumed for EPA drinking water health advisories) at the MCL concentration of 50 µg/L, a child's intake of arsenic is 50 µg/day or 5 µg/kg/day. Thus, arsenic intake at the MCL amount could lead to intakes which are 17 times higher than the midpoint of the EPA reference dose range (0.3 µg/kg/day). Even at drinking water concentrations as low as 4 µg/liter, arsenic intakes for the 10 kg child would exceed the midpoint of the RfD range.

## 5.0 References


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**Table 1**
**Soil Action Levels for the Chemicals of Concern Based on Noncarcinogenic Effects**
**Site Worker-Reasonable Maximum Exposure**

| Chemical | Soil Concentration (mg/kg) |
|---|---|
| **Inorganics** | |
| Antimony | 1.90E+02 |
| Arsenic | 1.78E+03 |
| Cadmium | 9.29E+02 |
| Lead | - |
| Selenium | 3.01E+04 |
| **Pesticides** | |
| 4,4'-DDD | - |
| 4,4'-DDE | - |
| 4,4'-DDT | 1.28E+03 |
| alpha-Chlordane | 1.53E+02 |
| alpha-BHC | 8.76E+02 |
| beta-BHC | 8.76E+02 |
| delta-BHC | 8.76E+02 |
| gamma-BHC (lindane) | 8.76E+02 |
| Dieldrin | 1.09E+02 |
| Endosulfan | 1.37E+02 |
| Endosulfan II | 1.37E+02 |
| Endosulfan sulfate | 1.37E+02 |
| Endrin ketone | 7.67E+02 |
| gamma-Chlordane | 1.53E+02 |
| Heptachlor | 1.46E+03 |
| Toxaphene | - |
| **Semivolatile organic chemicals** | |
| 1,4-Dichlorobenzene | † |
| 2-Methylnaphthalene | 1.06E+05 |
| Benzo(a)anthacene | - |
| Benzo(a)pyrene | - |
| Benzo(b)fluoranthene | - |
| Benzo(g,h,i)perylene | - |
| Benzo(k)fluoranthene | - |
| Benzoic Acid | † |
| Bis(2-ethylhexyl)phthalate | 5.49E+04 |
| Chrysene | - |
| Di-n-butyl phthalate | 2.92E+05 |
| Di-n-octyl phthalate | 5.84E+04 |
| Fluoranthene | 1.02E+05 |
| Indeno(1,2,3-c,d)pyrene | - |
| Naphthalene | 1.06E+05 |
| Pentachlorophenol | 8.76E+04 |
| Phenanthrene | - |
| Pyrene | 7.67E+04 |

**Table 1**
**Soil Action Levels for the Chemicals of Concern Based on Noncarcinogenic Effects**
**Site Worker-Reasonable Maximum Exposure**

| Chemical | Soil Concentration (mg/kg) |
|---|---|
| **Volatile organic chemicals** | |
| 1,2-Dichloroethane | - |
| 1,2-Dichloropropane | 1.10E+05 |
| Acetone | 2.92E+05 |
| Carbon disulfide | 2.92E+05 |
| Chlorobenzene | 5.84E+04 |
| Chloroform | 2.92E+04 |
| Tetrachlorothene | 2.92E+04 |
| Trichloroethene | 1.75E+04 |
| Xylenes (total) | † |
| **Polychlorinated dibenzodioxins & dibenzofurans** | |
| 2,3,7,8-TCDD Equivalents | - |

(-) soil action level could not be calculated due to lack of a reference dose
† - calculated soil action level exceeds theoretical maximum concentration (i.e., 1,000,000 mg/kg)

**Table 2**
**Soil Action Levels for the Chemicals of Concern Based on Carcinogenic Effects**
**Site Worker-Reasonable Maximum Exposure**

| | Soil Concentration Associated with a Lifetime Cancer Risk of: | | |
|---|---|---|---|
| **Chemical** | 1 x 10-4 (mg/kg) | 1 x 10-5 (mg/kg) | 1 x 10-6 (mg/kg) |
| **Inorganics** | | | |
| Antimony | na | na | na |
| Arsenic | 5.67E+02 | 5.67E+01 | 5.67E+00 |
| Cadmium | 3.61E+03 | 3.61E+02 | 3.61E+01 |
| Lead | nc | nc | nc |
| Selenium | na | na | na |
| **Pesticides** | | | |
| 4,4'-DDD | 2.98E+03 | 2.98E+02 | 2.98E+01 |
| 4,4'-DDE | 2.10E+03 | 2.10E+02 | 2.10E+01 |
| 4,4'-DDT | 2.04E+03 | 2.04E+02 | 2.04E+01 |
| alpha-Chlordane | 5.33E+02 | 5.33E+01 | 5.33E+00 |
| alpha-BHC | 1.25E+02 | 1.25E+01 | 1.25E+00 |
| beta-BHC | 4.38E+02 | 4.38E+01 | 4.38E+00 |
| delta-BHC | 1.25E+02 | 1.25E+01 | 1.25E+00 |
| gamma-BHC (lindane) | 6.29E+02 | 6.29E+01 | 6.29E+00 |
| Dieldrin | 3.72E+01 | 3.72E+00 | 3.72E-01 |
| Endosulfan | na | na | na |
| Endosulfan II | na | na | na |
| Endosulfan sulfate | na | na | na |
| Endrin ketone | na | na | na |
| gamma-Chlordane | 5.33E+02 | 5.33E+01 | 5.33E+00 |
| Heptachlor | 1.75E+02 | 1.75E+01 | 1.75E+00 |
| Toxaphene | 5.53E+02 | 5.53E+01 | 5.53E+00 |
| **Semivolatile organic chemicals** | | | |
| 1,4-Dichlorobenzene | 3.41E+04 | 3.41E+03 | 3.41E+02 |
| 2-Methylnaphthalene | na | na | na |
| Benzo(a)anthacene | 9.54E+02 | 9.54E+01 | 9.54E+00 |
| Benzo(a)pyrene | 9.54E+01 | 9.54E+00 | 9.54E-01 |
| Benzo(b)fluoranthene | 9.54E+02 | 9.54E+01 | 9.54E+00 |
| Benzo(g,h,i)perylene | na | na | na |
| Benzo(k)fluoranthene | 9.54E+02 | 9.54E+01 | 9.54E+00 |
| Benzoic Acid | na | na | na |
| Bis(2-ethylhexyl)phthalate | 5.49E+04 | 5.49E+03 | 5.49E+02 |
| Chrysene | 9.54E+03 | 9.54E+02 | 9.54E+01 |
| Di-n-butyl phthalate | na | na | na |
| Di-n-octyl phthalate | na | na | na |
| Fluoranthene | na | na | na |
| Indeno(1,2,3-c,d)pyrene | 9.54E+02 | 9.54E+01 | 9.54E+00 |
| Naphthalene | na | na | na |
| Pentachlorophenol | 6.81E+03 | 6.81E+02 | 6.81E+01 |
| Phenanthrene | na | na | na |
| Pyrene | na | na | na |

**Table 2**
**Soil Action Levels for the Chemicals of Concern Based on Carcinogenic Effects**
**Site Worker-Reasonable Maximum Exposure**

| | Soil Concentration Associated with a Lifetime Cancer Risk of: | | |
|---|---|---|---|
| **Chemical** | 1 x 10-4 (mg/kg) | 1 x 10-5 (mg/kg) | 1 x 10-6 (mg/kg) |
| **Volatile organic chemicals** | | | |
| 1,2-Dichloroethane | 8.66E+03 | 8.66E+02 | 8.66E+01 |
| 1,2-Dichloropropane | 1.20E+04 | 1.20E+03 | 1.20E+02 |
| Acetone | na | na | na |
| Carbon disulfide | na | na | na |
| Chlorobenzene | na | na | na |
| Chloroform | 8.98E+04 | 8.98E+03 | 8.98E+02 |
| Tetrachlorothene | 1.57E+04 | 1.57E+03 | 1.57E+02 |
| Trichloroethene | 7.29E+04 | 7.29E+03 | 7.29E+02 |
| Xylenes (total) | na | na | na |
| **Polychlorinated dibenzodioxins & dibenzofurans** | | | |
| 2,3,7,8-TCDD Equivalents | 4.95E-03 | 4.95E-04 | 4.95E-05 |

na = not applicable, chemical is not known to be carcinogenic
nc = chemical is considered to be a probable human carcinogen by the EPA.
There is no slope factor to calculate a cancer risk-based soil concentration.

**Table 3**
**Soil Action Levels for the Chemicals of Concern Based on Noncarcinogenic Effects**
**Adult Resident-Reasonable Maximum Exposure**

| Chemical | Soil Concentration (mg/kg) |
|---|---|
| **Inorganics** | |
| Antimony | 9.73E+01 |
| Arsenic | 2.14E+02 |
| Cadmium | 2.61E+02 |
| Lead | - |
| Selenium | 3.58E+03 |
| **Pesticides** | |
| 4,4'-DDD | - |
| 4,4'-DDE | - |
| 4,4'-DDT | 2.92E+02 |
| alpha-Chlordane | 3.50E+01 |
| alpha-BHC | 1.83E+02 |
| beta-BHC | 1.83E+02 |
| delta-BHC | 1.83E+02 |
| gamma-BHC (lindane) | 1.83E+02 |
| Dieldrin | 2.77E+01 |
| Endosulfan | 2.99E+01 |
| Endosulfan II | 2.99E+01 |
| Endosulfan sulfate | 2.99E+01 |
| Endrin ketone | 1.75E+02 |
| gamma-Chlordane | 3.50E+01 |
| Heptachlor | 3.04E+02 |
| Toxaphene | - |
| **Semivolatile organic chemicals** | |
| 1,4-Dichlorobenzene | † |
| 2-Methylnaphthalene | 2.36E+04 |
| Benzo(a)anthacene | - |
| Benzo(a)pyrene | - |
| Benzo(b)fluoranthene | - |
| Benzo(g,h,i)perylene | - |
| Benzo(k)fluoranthene | - |
| Benzoic Acid | † |
| Bis(2-ethylhexyl)phthalate | 1.19E+04 |
| Chrysene | - |
| Di-n-butyl phthalate | 6.08E+04 |
| Di-n-octyl phthalate | 1.22E+04 |
| Fluoranthene | 2.34E+04 |
| Indeno(1,2,3-c,d)pyrene | - |
| Naphthalene | 2.36E+04 |
| Pentachlorophenol | 1.83E+04 |
| Phenanthrene | - |
| Pyrene | 1.75E+04 |

**Table 3**
**Soil Action Levels for the Chemicals of Concern Based on Noncarcinogenic Effects**
**Adult Resident-Reasonable Maximum Exposure**

| Chemical | Soil Concentration (mg/kg) |
|---|---|
| **Volatile organic chemicals** | |
| 1,2-Dichloroethane | - |
| 1,2-Dichloropropane | - |
| Acetone | 6.08E+04 |
| Carbon disulfide | 6.08E+04 |
| Chlorobenzene | 1.22E+04 |
| Chloroform | 6.08E+03 |
| Tetrachlorothene | 6.08E+03 |
| Trichloroethene | 3.65E+03 |
| Xylenes (total) | † |
| **Polychlorinated dibenzodioxins & dibenzofurans** | |
| 2,3,7,8-TCDD Equivalents | - |

(-) soil action level could not be calculated due to lack of a reference dose
† - calculated soil action level exceeds theoretical maximum concentration (i.e., 1,000,000 mg/kg)

**Table 4**
**Soil Action Levels for the Chemicals of Concern Based on Carcinogenic Effects**
**Adult Resident-Reasonable Maximum Exposure**

| | Soil Concentration Associated with a Lifetime Cancer Risk of: | | |
|---|---|---|---|
| **Chemical** | 1 x 10-4 (mg/kg) | 1 x 10-5 (mg/kg) | 1 x 10-6 (mg/kg) |
| **Inorganics** | | | |
| Antimony | na | na | na |
| Arsenic | 8.37E+01 | 8.37E+00 | 8.37E-01 |
| Cadmium | 2.15E+03 | 2.15E+02 | 2.15E+01 |
| Lead | nc | nc | nc |
| Selenium | na | na | na |
| **Pesticides** | | | |
| 4,4'-DDD | 5.68E+02 | 5.68E+01 | 5.68E+00 |
| 4,4'-DDE | 4.01E+02 | 4.01E+01 | 4.01E+00 |
| 4,4'-DDT | 3.97E+02 | 3.97E+01 | 3.97E+00 |
| alpha-Chlordane | 1.04E+02 | 1.04E+01 | 1.04E+00 |
| alpha-BHC | 2.23E+01 | 2.23E+00 | 2.23E-01 |
| beta-BHC | 7.80E+01 | 7.80E+00 | 7.80E-01 |
| delta-BHC | 2.23E+01 | 2.23E+00 | 2.23E-01 |
| gamma-BHC (lindane) | 1.09E+02 | 1.09E+01 | 1.09E+00 |
| Dieldrin | 8.00E+00 | 8.00E-01 | 8.00E-02 |
| Endosulfan | na | na | na |
| Endosulfan II | na | na | na |
| Endosulfan sulfate | na | na | na |
| Endrin ketone | na | na | na |
| gamma-Chlordane | 1.04E+02 | 1.04E+01 | 1.04E+00 |
| Heptachlor | 3.12E+01 | 3.12E+00 | 3.12E-01 |
| Toxaphene | 1.17E+02 | 1.17E+01 | 1.17E+00 |
| **Semivolatile organic chemicals** | | | |
| 1,4-Dichlorobenzene | 5.91E+03 | 5.91E+02 | 5.91E+01 |
| 2-Methylnaphthalene | na | na | na |
| Benzo(a)anthacene | 1.85E+02 | 1.85E+01 | 1.85E+00 |
| Benzo(a)pyrene | 1.85E+01 | 1.85E+00 | 1.85E-01 |
| Benzo(b)fluoranthene | 1.85E+02 | 1.85E+01 | 1.85E+00 |
| Benzo(g,h,i)perylene | na | na | na |
| Benzo(k)fluoranthene | 1.85E+02 | 1.85E+01 | 1.85E+00 |
| Benzoic Acid | na | na | na |
| Bis(2-ethylhexyl)phthalate | 9.95E+03 | 9.95E+02 | 9.95E+01 |
| Chrysene | 1.85E+03 | 1.85E+02 | 1.85E+01 |
| Di-n-butyl phthalate | na | na | na |
| Di-n-octyl phthalate | na | na | na |
| Fluoranthene | na | na | na |
| Indeno(1,2,3-c,d)pyrene | 1.85E+02 | 1.85E+01 | 1.85E+00 |
| Naphthalene | na | na | na |
| Pentachlorophenol | 1.18E+03 | 1.18E+02 | 1.18E+01 |
| Phenanthrene | na | na | na |
| Pyrene | na | na | na |

**Table 4**
**Soil Action Levels for the Chemicals of Concern Based on Carcinogenic Effects**
**Adult Resident-Reasonable Maximum Exposure**

| | Soil Concentration Associated with a Lifetime Cancer Risk of: | | |
|---|---|---|---|
| **Chemical** | 1 x 10-4 (mg/kg) | 1 x 10-5 (mg/kg) | 1 x 10-6 (mg/kg) |
| **Volatile organic chemicals** | | | |
| 1,2-Dichloroethane | 1.54E+03 | 1.54E+02 | 1.54E+01 |
| 1,2-Dichloropropane | 2.09E+03 | 2.09E+02 | 2.09E+01 |
| Acetone | na | na | na |
| Carbon disulfide | na | na | na |
| Chlorobenzene | na | na | na |
| Chloroform | 2.03E+04 | 2.03E+03 | 2.03E+02 |
| Tetrachlorothene | 2.73E+03 | 2.73E+02 | 2.73E+01 |
| Trichloroethene | 1.28E+04 | 1.28E+03 | 1.28E+02 |
| Xylenes (total) | na | na | na |
| **Polychlorinated dibenzodioxins & dibenzofurans** | | | |
| 2,3,7,8-TCDD Equivalents | 9.19E-04 | 9.19E-05 | 9.19E-06 |

na = not applicable, chemical is not known to be carcinogenic
nc = chemical is considered to be a probable human carcinogen by the EPA.
There is no slope factor to calculate a cancer risk-based soil concentration.

**Table 5**
**Soil Action Levels for the Chemicals of Concern Based on Noncarcinogenic Effects**
**Child Resident-Reasonable Maximum Exposure**

| Chemical | Soil Concentration (mg/kg) |
|---|---|
| **Inorganics** | |
| Antimony | 1.69E+01 |
| Arsenic | 2.32E+01 |
| Cadmium | 3.34E+01 |
| Lead | - |
| Selenium | 3.88E+02 |
| **Pesticides** | |
| 4,4'-DDD | - |
| 4,4'-DDE | - |
| 4,4'-DDT | 3.54E+01 |
| alpha-Chlordane | 4.24E+00 |
| alpha-BHC | 2.16E+01 |
| beta-BHC | 2.16E+01 |
| delta-BHC | 2.16E+01 |
| gamma-BHC (lindane) | 2.16E+01 |
| Dieldrin | 3.45E+00 |
| Endosulfan | 3.57E+00 |
| Endosulfan II | 3.57E+00 |
| Endosulfan sulfate | 3.57E+00 |
| Endrin ketone | 2.12E+01 |
| gamma-Chlordane | 4.24E+00 |
| Heptachlor | 3.60E+01 |
| Toxaphene | - |
| **Semivolatile organic chemicals** | |
| 1,4-Dichlorobenzene | † |
| 2-Methylnaphthalene | 2.84E+03 |
| Benzo(a)anthacene | - |
| Benzo(a)pyrene | - |
| Benzo(b)fluoranthene | - |
| Benzo(g,h,i)perylene | - |
| Benzo(k)fluoranthene | - |
| Benzoic Acid | 2.88E+05 |
| Bis(2-ethylhexyl)phthalate | 1.43E+03 |
| Chrysene | - |
| Di-n-butyl phthalate | 7.21E+03 |
| Di-n-octyl phthalate | 1.44E+03 |
| Fluoranthene | 2.83E+03 |
| Indeno(1,2,3-c,d)pyrene | - |
| Naphthalene | 2.84E+03 |
| Pentachlorophenol | 2.16E+03 |
| Phenanthrene | - |
| Pyrene | 2.12E+03 |

**Table 5**
**Soil Action Levels for the Chemicals of Concern Based on Noncarcinogenic Effects**
**Child Resident-Reasonable Maximum Exposure**

| Chemical | Soil Concentration (mg/kg) |
|---|---|
| **Volatile organic chemicals** | |
| 1,2-Dichloroethane | - |
| 1,2-Dichloropropane | 3.37E+04 |
| Acetone | 7.21E+03 |
| Carbon disulfide | 7.21E+03 |
| Chlorobenzene | 1.44E+03 |
| Chloroform | 7.21E+02 |
| Tetrachlorothene | 7.21E+02 |
| Trichloroethene | 4.33E+02 |
| Xylenes (total) | 1.43E+05 |
| **Polychlorinated dibenzodioxins & dibenzofurans** | |
| 2,3,7,8-TCDD Equivalents | - |

(-) soil action level could not be calculated due to lack of a reference dose
† - calculated soil action level exceeds theoretical maximum concentration (i.e., 1,000,000 mg/kg)

Table 6
Soil Action Levels for the Chemicals of Concern Based on Carcinogenic Effects
Child Resident-Reasonable Maximum Exposure

| | Soil Concentration Associated with a Lifetime Cancer Risk of: | | |
|---|---|---|---|
| Chemical | 1 x 10-4 (mg/kg) | 1 x 10-5 (mg/kg) | 1 x 10-6 (mg/kg) |
| **Inorganics** | | | |
| Antimony | na | na | na |
| Arsenic | 4.89E+01 | 4.89E+00 | 4.89E-01 |
| Cadmium | 4.60E+03 | 4.60E+02 | 4.60E+01 |
| Lead | nc | nc | nc |
| Selenium | na | na | na |
| **Pesticides** | | | |
| 4,4'-DDD | 3.44E+02 | 3.44E+01 | 3.44E+00 |
| 4,4'-DDE | 2.43E+02 | 2.43E+01 | 2.43E+00 |
| 4,4'-DDT | 2.42E+02 | 2.42E+01 | 2.42E+00 |
| alpha-Chlordane | 6.33E+01 | 6.33E+00 | 6.33E-01 |
| alpha-BHC | 1.33E+01 | 1.33E+00 | 1.33E-01 |
| beta-BHC | 4.66E+01 | 4.66E+00 | 4.66E-01 |
| delta-BHC | 1.33E+01 | 1.33E+00 | 1.33E-01 |
| gamma-BHC (lindane) | 6.47E+01 | 6.47E+00 | 6.47E-01 |
| Dieldrin | 5.01E+00 | 5.01E-01 | 5.01E-02 |
| Endosulfan | na | na | na |
| Endosulfan II | na | na | na |
| Endosulfan sulfate | na | na | na |
| Endrin ketone | na | na | na |
| gamma-Chlordane | 6.33E+01 | 6.33E+00 | 6.33E-01 |
| Heptachlor | 1.86E+01 | 1.86E+00 | 1.86E-01 |
| Toxaphene | 7.32E+01 | 7.32E+00 | 7.32E-01 |
| **Semivolatile organic chemicals** | | | |
| 1,4-Dichlorobenzene | 3.50E+03 | 3.50E+02 | 3.50E+01 |
| 2-Methylnaphthalene | na | na | na |
| Benzo(a)anthacene | 1.13E+02 | 1.13E+01 | 1.13E+00 |
| Benzo(a)pyrene | 1.13E+01 | 1.13E+00 | 1.13E-01 |
| Benzo(b)fluoranthene | 1.13E+02 | 1.13E+01 | 1.13E+00 |
| Benzo(g,h,i)perylene | na | na | na |
| Benzo(k)fluoranthene | 1.13E+02 | 1.13E+01 | 1.13E+00 |
| Benzoic Acid | na | na | na |
| Bis(2-ethylhexyl)phthalate | 5.96E+03 | 5.96E+02 | 5.96E+01 |
| Chrysene | 1.13E+03 | 1.13E+02 | 1.13E+01 |
| Di-n-butyl phthalate | na | na | na |
| Di-n-octyl phthalate | na | na | na |
| Fluoranthene | na | na | na |
| Indeno(1,2,3-c,d)pyrene | 1.13E+02 | 1.13E+01 | 1.13E+00 |
| Naphthalene | na | na | na |
| Pentachlorophenol | 7.01E+02 | 7.01E+01 | 7.01E+00 |
| Phenanthrene | na | na | na |
| Pyrene | na | na | na |

**Table 6**
**Soil Action Levels for the Chemicals of Concern Based on Carcinogenic Effects**
**Child Resident-Reasonable Maximum Exposure**

| | Soil Concentration Associated with a Lifetime Cancer Risk of: | | |
|---|---|---|---|
| **Chemical** | 1 x 10-4 (mg/kg) | 1 x 10-5 (mg/kg) | 1 x 10-6 (mg/kg) |
| **Volatile organic chemicals** | | | |
| 1,2-Dichloroethane | 9.21E+02 | 9.21E+01 | 9.21E+00 |
| 1,2-Dichloropropane | 1.24E+03 | 1.24E+02 | 1.24E+01 |
| Acetone | na | na | na |
| Carbon disulfide | na | na | na |
| Chlorobenzene | na | na | na |
| Chloroform | 1.33E+04 | 1.33E+03 | 1.33E+02 |
| Tetrachlorothene | 1.62E+03 | 1.62E+02 | 1.62E+01 |
| Trichloroethene | 7.63E+03 | 7.63E+02 | 7.63E+01 |
| Xylenes (total) | na | na | na |
| **Polychlorinated dibenzodioxins & dibenzofurans** | | | |
| 2,3,7,8-TCDD Equivalents | 5.54E-04 | 5.54E-05 | 5.54E-06 |

na = not applicable, chemical is not known to be carcinogenic
nc = chemical is considered to be a probable human carcinogen by the EPA.
There is no slope factor to calculate a cancer risk-based soil concentration.

**Table 7**
**Sediment Action Levels for the Chemicals of Concern Based on Noncarcinogenic Effects**
**Child Resident-Reasonable Maximum Exposure**

| Chemical | Sediment Concentration (mg/kg) |
|---|---|
| **Inorganics** | |
| Arsenic | 4.07E+02 |
| Lead | - |
| | |
| **Pesticides** | |
| 4,4'-DDD | - |
| 4,4'-DDE | - |
| 4,4'-DDT | 6.19E+02 |
| alpha-Chlordane | 7.42E+01 |
| alpha-BHC | 3.78E+02 |
| beta-BHC | 3.78E+02 |
| delta-BHC | 3.78E+02 |
| gamma-BHC (lindane) | 3.78E+02 |
| Dieldrin | 6.03E+01 |
| Endosulfan II | 6.25E+01 |
| Endosulfan sulfate | 6.25E+01 |
| gamma-Chlordane | 7.42E+01 |
| Toxaphene | - |
| | |
| **Semivolatile organic chemicals** | |
| 1,4-Dichlorobenzene | - |
| 2-Methylnaphthalene | 4.98E+04 |
| Benzo(a)anthacene | - |
| Benzo(a)pyrene | - |
| Benzo(b)fluoranthene | - |
| Benzo(g,h,i)perylene | - |
| Benzo(k)fluoranthene | - |
| Benzoic Acid | † |
| Bis(2-ethylhexyl)phthalate | 2.50E+04 |
| Chrysene | - |
| Di-n-butyl phthalate | 1.26E+05 |
| Di-n-octyl phthalate | 2.52E+04 |
| Fluoranthene | 4.95E+04 |
| Indeno(1,2,3-c,d)pyrene | - |
| Naphthalene | 4.98E+04 |
| Pentachlorophenol | 3.78E+04 |
| Phenanthrene | - |
| Pyrene | 3.71E+04 |
| | |
| **Volatile organic chemicals** | |
| Acetone | 1.26E+05 |
| Tetrachlorothene | 1.26E+04 |
| Trichloroethene | 7.57E+03 |
| Xylenes (total) | † |

(-) sediment action level could not be calculated due to lack of a reference dose
† - calculated sediment action level exceeds theoretical maximum concentration (i.e., 1,000,000 mg/kg)

**Table 8**
**Sediment Action Levels for the Chemicals of Concern Based on Carcinogenic Effects**
**Child Resident-Reasonable Maximum Exposure**

| | Sediment Concentration Associated with a Lifetime Cancer Risk of: | | |
|---|---|---|---|
| **Chemical** | 1 x 10-4 (mg/kg) | 1 x 10-5 (mg/kg) | 1 x 10-6 (mg/kg) |
| **Inorganics** | | | |
| Arsenic | 8.79E+02 | 8.79E+01 | 8.79E+00 |
| Lead | nc | nc | nc |
| **Pesticides** | | | |
| 4,4'-DDD | 6.01E+03 | 6.01E+02 | 6.01E+01 |
| 4,4'-DDE | 4.25E+03 | 4.25E+02 | 4.25E+01 |
| 4,4'-DDT | 4.25E+03 | 4.25E+02 | 4.25E+01 |
| alpha-Chlordane | 1.11E+03 | 1.11E+02 | 1.11E+01 |
| alpha-BHC | 2.34E+02 | 2.34E+01 | 2.34E+00 |
| beta-BHC | 8.18E+02 | 8.18E+01 | 8.18E+00 |
| delta-BHC | 2.34E+02 | 2.34E+01 | 2.34E+00 |
| gamma-BHC (lindane) | 1.13E+03 | 1.13E+02 | 1.13E+01 |
| Dieldrin | 8.79E+01 | 8.79E+00 | 8.79E-01 |
| Endosulfan II | na | na | na |
| Endosulfan sulfate | na | na | na |
| gamma-Chlordane | 1.11E+03 | 1.11E+02 | 1.11E+01 |
| Toxaphene | 1.28E+03 | 1.28E+02 | 1.28E+01 |
| **Semivolatile organic chemicals** | | | |
| 1,4-Dichlorobenzene | 6.13E+04 | 6.13E+03 | 6.13E+02 |
| 2-Methylnaphthalene | na | na | na |
| Benzo(a)anthacene | 1.98E+03 | 1.98E+02 | 1.98E+01 |
| Benzo(a)pyrene | 1.98E+02 | 1.98E+01 | 1.98E+00 |
| Benzo(b)fluoranthene | 1.98E+03 | 1.98E+02 | 1.98E+01 |
| Benzo(g,h,i)perylene | na | na | na |
| Benzo(k)fluoranthene | 1.98E+03 | 1.98E+02 | 1.98E+01 |
| Benzoic Acid | na | na | na |
| Bis(2-ethylhexyl)phthalate | 1.04E+05 | 1.04E+04 | 1.04E+03 |
| Chrysene | 1.98E+04 | 1.98E+03 | 1.98E+02 |
| Di-n-butyl phthalate | na | na | na |
| Di-n-octyl phthalate | na | na | na |
| Fluoranthene | na | na | na |
| Indeno(1,2,3-c,d)pyrene | 1.98E+03 | 1.98E+02 | 1.98E+01 |
| Naphthalene | na | na | na |
| Pentachlorophenol | 1.23E+04 | 1.23E+03 | 1.23E+02 |
| Phenanthrene | na | na | na |
| Pyrene | na | na | na |
| **Volatile organic chemicals** | | | |
| Acetone | na | na | na |
| Tetrachlorothene | 2.83E+04 | 2.83E+03 | 2.83E+02 |
| Trichloroethene | 1.34E+05 | 1.34E+04 | 1.34E+03 |
| Xylenes (total) | na | na | na |

na = not applicable, chemical is not known to be carcinogenic
nc = chemical is considered to be a probable human carcinogen by the EPA.
There is no slope factor to calculate a cancer risk-based sediment concentration.

## Appendix B
# Calculation of Groundwater Protection Levels

Attachment

# Defining Model Parameters for Estimating Soil-Cleanup Levels for Protection of Groundwater

## Summary and Conclusions

In the RI report, values were estimated for the various parameters required as input to the fate-and-transport modeling in the subsurface at the Woolfolk site. These input parameters have been objectively reviewed to determine if overly conservative values were used. The conclusion of the review is that values for the adsorption of arsenic, lead, lindane, and toxaphene and degradation of organic pesticides should be adjusted to values that are more representative of average conditions expected at the site.

The following values were revised:

- Distribution coefficients
  - Arsenic - from the minimum value of 372 ml/gm to the median value of 3,241 ml/gm
  - Lead - from the minimum value of 176 ml/gm to the median value of 14,479 ml/gm
  - Lindane - from an estimated value of 2.1 ml/gm to a measured value of 133 ml/gm
  - Toxaphene - from an estimated value of 1.8 ml/gm to a measured value of 4,760 ml/gm
- Degradation rate constants
  - Lindane - from 0/yr to 0.43/yr
  - Toxaphene - from 0/yr to 0.050/yr

The following discussion describes the selection of the revised value.

## Reevaluation of Model-Input Parameters

Several fate-and-transport parameters were assigned conservative values for the purposes of the modeling in the RI. These values were intended to cause the highest level of contamination to reach the groundwater system. In particular, conservative values for the following parameters were used:

- The degree of adsorption of arsenic, lead, lindane, and toxaphene on the contaminated soil

- The amount of degradation organic contaminants would experience during migration

Each of these parameters will be discussed in turn.

## Adsorption of Arsenic, Lead, Lindane, and Toxaphene

**Adsorption of arsenic and lead.** In the RI report (Table 5-11) the values for the distribution coefficients ($K_d$s) for arsenic and lead obtained from leaching tests performed on site soils were presented; these results are reproduced in Table 1. Included in Table 1 are values for leaching tests performed as part of the treatability study on soils; these were obtained from the treatability study report (Table 1-1).

The $K_d$ values for arsenic range over almost two orders of magnitude and the $K_d$ values for lead range over almost three orders of magnitude. This is not surprising, given the complexity of the processes that control the adsorption of metals on soils, including soil and water pH, soil temperature, and the materials that adsorb the metals. Note that the high and low $K_d$ values for arsenic appear to be extremes, and most of the $K_d$ values group around the median. There is a greater spread in the $K_d$ values for lead.

It should also be noted that for two of the five arsenic-leaching tests and for three of the five lead-leaching tests shown in Table 1, the effluent concentrations were below the MCLs for the respective chemicals. Concentrations in the source soil water such as these would obviously not contribute to concentrations in the groundwater greater than MCLs even if dilution in the aquifer was not considered.

The conclusion of this discussion is that use of the minimum $K_d$s for arsenic and lead significantly underestimates the role that adsorption plays in controlling the concentration of contamination in the soil water in the source material under average conditions. It is reasonable, then, that either the mean or median value for these parameters be used instead of the minimum. Accordingly, the median values for the $K_d$s for arsenic and lead were used in revising the soil-cleanup levels estimated in the FS report.

**Adsorption of Lindane and Toxaphene.** A major influence on adsorption capacity for organic chemicals is considered to be the organic matter in the subsurface. Therefore, the degree of adsorption ($K_d$) is typically assumed to be defined as the product of the fraction of organic carbon in the subsurface and the carbon/water distribution coefficient ($K_{oc}$). Using the data on total organic carbon obtained from the site, the $K_d$s for lindane and toxaphene were estimated to be 2.1 and 1.8 ml/gm, respectively. $K_{oc}$ measurements vary: EPA (1989) reports a $K_{oc}$ for toxaphene of 6,000 ml/gm, several times higher than the value used in this modeling (964 ml/gm).

**Table 1**
**$K_d$s CALCULATED FROM LEACHING TEST DATA**
**ARSENIC AND LEAD**

| Sample Designation (Depth in feet) | Soil Concentration (mg/kg) | | Effluent Concentration (mg/l) | | Distribution Coefficient (ml/gm) | |
|---|---|---|---|---|---|---|
| | Arsenic | Lead | Arsenic | Lead | Arsenic | Lead |
| WCL1(0-1) | 3,670 | 3,510 | 0.22 | 1.22 | 16,682 | 2,877 |
| WCL2(0-1) | 7.1 | 22.3 | 0.0013 | 0.0086 | 5,462 | 2,593 |
| WCL3(0-1) | 63.2 | 271 | 0.0327 | 0.0084 | 1,933 | 32,262 |
| WCL4(0-1) | 15,200 | 5,620 | 40.9 | 0.0024 | 372 | 2,341,667 |
| WCSST-DIE | 3,533 | 1,723 | 1.1 | 0.119 | 3,241 | 14,479 |

Notes:

| | Mean $K_d$ (ml/gm) | Median $K_d$ (ml/gm) | Minimum $K_d$ (ml/gm) | MCL (mg/l) |
|---|---|---|---|---|
| Arsenic | 5,538 | 3,241 | 372 | 0.050 |
| Lead | 478,776 | 14,479 | 2,593 | 0.015 |

Another important factor in assessing the mobility of these compounds is their solubility in water. In general, the lower the water solubility of a chemical the more likely it is that it will have a low mobility in the environment due to a greater tendency to be adsorbed on soil. The water solubilities of lindane and toxaphene are about 8 to 10 mg/l and less than 1 to about 3 mg/l, respectively (Montgomery and Welkom, 1990). Ney (1990) notes that these solubilities are characteristic of chemicals that have low mobility in the environment. He also notes the discrepancy between the low solubility and the low $K_{oc}$ for lindane; the latter value is more characteristic of such moderately mobile compounds as tetrachloroethene. And yet lindane and toxaphene are considered to have low mobility in the subsurface (EPA, 1990, and Knox et al., 1993). Therefore, it is apparent that the $K_d$s for lindane and toxaphene used in the RI underestimated the potential for adsorption in the soil.

The treatability tests for soil remediation included leaching tests for lindane and toxaphene. The results are shown in Table 2. The effluent concentration for toxaphene was measured to be less than the detection limit of 0.025 mg/l; the detection limit is used as the effluent concentration for the purposes of this modeling. The $K_d$s obtained from these tests are much greater than those estimated using only the carbon/water ratio and the fraction of organic carbon in the soil. These $K_d$s are more representative of actual site conditions because they are measured directly with samples obtained at the site.

The conclusion is that it appears that lindane and toxaphene are retained in the soil at the source to a greater extent than indicated by the $K_{oc}$ values used in this modeling. Therefore, the $K_d$ values obtained from the treatability tests were used in revising the soil-cleanup levels estimated in the FS report.

## Degradation

As organic chemicals, the 1,2-DCA and pesticides lindane and toxaphene are subject to degradation by a number of biotic and abiotic processes. To be conservative, degradation was not originally considered in the modeling. In reality, although there are no site-specific data available, it is likely that degradation occurs at the site because of the temperate climate, abundance of rainfall, and presence of organic matter in the soil.

A literature search revealed a wide range of degradation constants for these chemicals. The results reported were obtained from many types of tests, particularly studies of agricultural fields where pesticides have been applied and their persistence studied. Table 3 provides a selection of degradation constants obtained from the literature, along with the reference.

The value for lindane from Rao et al. (1985) and for toxaphene from Tucker (1986) were reported in the RI in Table 5-12. Table 3 includes only degradation values appropriate for soils in agricultural fields and does not include constants obviously estimated for wet soils where degradation is typically at much higher rates.

| Table 2<br>$K_d$s ESTIMATED FROM LEACHING TEST DATA<br>LINDANE AND TOXAPHENE | | | |
|---|---|---|---|
| **Chemical** | **Average Soil Concentration (mg/kg)** | **Effluent Concentration (mg/l)** | **Distribution Coefficient (ml/gm)** |
| Lindane | 2.4 | 0.018 | 133 |
| Toxaphene | 119 | LT 0.025 | 4,760 |

Notes:

LT = Less than

The degradation constants provided in Table 3 do not generally distinguish between biotic and abiotic degradation because the results are obtained from the field where it is difficult, if not impossible, to discriminate between the different processes. The degradation constants may also include volatilization, which, although not a major process for pesticides, will still occur.

The modeling provided estimates of travel times from the source material at the surface to the aquifer. The RI (Table 5-17) reports the arrival times of the peak concentrations assuming an infiltration rate of 5.4 in/yr. For lindane the peak arrival time is at about 186 years and for toxaphene the peak arrival time is at about 166 years. Appreciable concentrations of these contaminants were estimated not to reach the aquifer in less than about 100 years. The peak concentration of 1,2-DCA reached the water table at about 17 years and appreciable levels reached the water table at about 10 years.

The final concentrations of these contaminants reaching the aquifer assuming degradation occurs is estimated using the relationship:

$$C = C_0 \times e^{-lt}$$

where $C$ = concentration after time t
$C_0$ = initial concentration
$l$ = degradation constant.

The slowest rate of degradation will be associated with the smallest value of the degradation constant because the exponent in the equation above is negative. The smallest degradation constant in Table 3 for lindane is 0.43/yr, for toxaphene is 0.050/yr, and for 1,2-DCA is 0.69/yr. Substituting these degradation constants into the equation above results in a reduction of concentration of lindane after 100 years of $10^{-19}$ and of toxaphene of 0.0067 of the original concentration. For 1,2-DCA, in 10 years the reduction in concentration is 0.0010. These values represent almost complete degradation of these chemicals during migration. It is recognized that the rates of degradation for these organic compounds will vary greatly as a function of such factors as soil temperature, the concentration of microbes, and the amount of organic matter. However, with such conservative reductions as those estimated here it can be assumed that lindane, toxaphene, and 1,2-DCA will not arrive in significant concentrations in the time frame simulated.

## Other Parameters

**Infiltration of Water at the Surface.** Water infiltrating the ground will pick up contamination as the contaminants desorb from the soil. The magnitude of infiltration has not been defined well in the environment because it is a function of so many factors such as the nature of the ground cover (e.g., type of vegetation, permeability of the natural soil, and presence of man-made cover), the slope of the surface, and the magnitude of evaporation and transpiration from plants. Typical values of recharge range from 20 to 33 percent of the total precipitation. Because the shallow soil at the site has high concentrations of clay

| Table 3<br>DEGRADATION CONSTANTS FOR LINDANE AND TOXAPHENE OBTAINED FROM THE LITERATURE | | | |
|---|---|---|---|
| **Chemical** | **Half-Life (yr)** | **Degradation Constant (/yr)** | **Reference** |
| Lindane | 0.73 | 0.95 | Rao et al., 1985 |
| | 1.6 | 0.43 | Gunther, 1983 |
| | 0.096 to 0.70 | 7.2 to 0.98 | Stevens et al., 1989 |
| | 0.50 | 1.4 | Kollig et al., 1989 |
| | 0.66 to 1.1 | 1.1 to 0.63 | Howard et al., 1991 |
| | 1.1 | 0.63 | Wauchope et al., 1992 |
| Toxaphene | 1.4 | 0.50 | Tucker, 1986 |
| | 0.80 to 14 | 0.87 to 0.050 | HSDB, 1993 |
| | 0.17 to 0.34 | 4.2 to 2.1 | Seiber et al., 1979 |
| | 0.025 | 28 | Wauchope et al., 1992 |
| 1,2-DCA | 0.5 to 1.0 | 1.4 to 0.69 | Howard et al., 1991 |

and silt, it was assumed that the natural rate of infiltration was 20 percent of the total precipitation, or 10.8 inches per year of a total precipitation of about 54 inches per year.

For the purposes of the fate-and-transport modeling, a value of one-half of the estimated natural infiltration, or 5.4 inches per year, was assumed to conservatively represent infiltration through man-made covers of clay and vegetation at the site; infiltration through concrete and asphalt was not considered. In reality, large areas of the site will be covered with concrete or asphalt pavement as part of the remediation of soil contamination. This will greatly reduce the amount of infiltration into the soil. Even less infiltration will occur in areas where landfills are constructed; these structures will include man-made liners expected to reduce infiltration practically to zero.

The rate of infiltration is incorporated into the modeling to calculate the total mass of contamination entering the groundwater system in the Summers model, which was used to estimate the mixing in the aquifer. The Summers model is:

$$C_w = \frac{Q_p * C_p + Q_a * C_a}{Q_p + Q_a}$$

where:
- $C_w$ = concentration in groundwater due to dilution
- $Q_p$ = volume rate of infiltration
- $C_p$ = concentration of chemical in soil water
- $Q_a$ = volume rate of flow in aquifer
- $C_a$ = initial concentration of chemical in aquifer

The assumption is that the initial concentration in the aquifer is zero, which eliminates the second term in the numerator of the equation. It is apparent, then, that the equation is approximately linear for low rates of infiltration and moderate to high rates of aquifer flow, whereby halving the infiltration rate approximately halves the concentration of the contaminant in the underlying groundwater. Therefore, reducing the infiltration rate has a significant effect on the concentration in the groundwater. Ideally, of course, the infiltration rate would be reduced to zero and no contaminants would be mobilized at all.

Cedergren (1989) reports a wide range of permeabilities for pavements, mostly asphaltic in nature. One test (page 346) yielded a permeability of 0.0002 feet per day, or about 0.88 inches per year (in/yr), for a traffic-compacted sample from a roadway. Troxell et al. (1968, page 47) report that mature concrete will have a permeability similar to that of fairly dense rock, such as marble or diorite, which have unfractured permeabilities on the order of 0.25 in/yr or less (Freeze and Cherry, 1979). Although cracking significantly increases the permeability of the cover, proper maintenance will minimize this effect. Additives are available to reduce the permeability of both asphalt and concrete, and proper sloping of the surfaces will reduce the potential for ponding.

The conclusion is that the infiltration rate for most of the site will likely be significantly less than that used in the modeling. Although this reduction of infiltration is not considered quantitatively in the modeling, it provides a significant factor of safety for the soil-cleanup levels estimated.

**Decrease of Contamination at the Source.** The modeling assumes that the source maintains a constant value for the duration of its presence. In reality, of course, the concentration in the source soil is declining as contaminants are leached. As a result, the concentration in the soil water migrating downward also declines, whether or not dispersion or other attenuation processes are occurring. As a result, the concentration reaching the water table and mixing with the water in the aquifer will also decline.

The rate of decline in contaminant concentration in the source soil is probably exponential. However, the rate constant is difficult to define without site-specific data. Regardless, the concentrations reaching the aquifer will be gradually less over time than those modeled and the resulting soil-cleanup levels estimated would be higher. This adds an additional factor of safety to the estimates made for the FS.

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WDCR772/003.WP5

## Appendix B
# Calculation of Groundwater Protection Levels

Calculations of groundwater protection levels are based on the results of the fate and transport modeling discussed in Chapter 5 of the RI report. In the modeling for the RI, the concentrations of selected chemicals of concern in both the surficial aquifer and the Upper Cretaceous water table aquifer were estimated on the basis of their transport from the surface source to the groundwater, accounting for dispersion in the unsaturated zone. The source terms were the average concentrations of each chemical in the surface soil.

In calculating groundwater protection levels, the concentration of a chemical that may be left in the surface soil and not exceed ARARs is estimated. In each case, the ARAR is the MCL for the chemical. The groundwater protection level in the soil is estimated by calculating backward from the MCL in the groundwater, using estimates of dispersion, dilution, and other parameters in the fate and transport modeling. For the purposes of the FS, the groundwater protection levels are based on meeting the MCLs in the surficial aquifer.

Parameters used in the fate-and-transport modeling for the FS provide soil-cleanup levels that are very protective of groundwater quality. Representative values of fate-and-transport parameters have been defined, and some factors that would add to the level of protection have not been considered quantitatively. Therefore, there is a margin of safety despite the natural variation in the values of fate-and-transport parameters.

In the fate and transport modeling discussed in the RI, the concentration of a chemical in the soil at the source was estimated using the average concentration of the chemical in the soil and its distribution coefficient ($K_d$). The model was then used to estimate the reduction in concentration of the chemical as a result of dispersion and other processes as it traveled from the soil water at the source to the water table of the surficial aquifer. The volume flow rate of the surficial aquifer was then used to estimate the dilution of the chemical that would occur as the chemical was mixed in the surficial aquifer.

A change was made in the dilution factor for mixing in the surficial aquifer from that used in the RI. After performing the fate and transport modeling discussed in the RI report, an additional hydrogeologic evaluation of the site was performed. This evaluation was based on new data on aquifer hydraulic characteristics and water levels. The resulting new data were used in estimating the effects of groundwater extraction, as discussed in Chapter 3 of the FS report. In order to be consistent in the calculations, the data were also used to estimate new dilution factors. The dilution factor also was adjusted to account for a larger area of the site containing contaminated soil. Changes to other fate-and-transport parameters from those used in the RI are discussed in the attachment to this appendix.

In the fate and transport modeling performed for the RI report, the site was divided into three areas on the basis of general operations and average levels of soil contamination. In

order to simplify the calculation of groundwater protection levels for the FS, the site was considered as a single unit.

Table B-1 contains the parameters used to calculate a new dilution term for the surficial aquifer using the Summers model. The calculation of dilution is based on the equation

$$C_w = \frac{Q_p * C_p + Q_a * C_a}{Q_p + Q_a}$$

where: $C_w$ = concentration in groundwater due to dilution
$Q_p$ = volume rate of infiltration
$C_p$ = concentration of chemical in soil water
$Q_a$ = volume rate of flow in aquifer
$C_a$ = initial concentration of chemical in aquifer

As shown in Table B-1, contamination reaching the surficial aquifer is diluted to 35 percent of its original concentration.

The assumption is that the initial concentration in the aquifer is zero, which eliminates the second term in the numerator of the equation. This assumption is valid because as the aquifer is remediated by the groundwater extraction system, uncontaminated groundwater will be flowing into the aquifers from off of the site.

The degree of dispersion was estimated by running the fate and transport model to determine the reduction in the concentration through the unsaturated zone. A reduction factor was then defined to describe the effects of dispersion. No reduction factor was determined for lead, arsenic, lindane, or toxaphene because their persistence in soil causes concentrations of these chemicals at the water table of the surficial aquifer to be at concentrations equal to those in the soil water at the source of the contamination.

Table B-2 shows the sequence of calculations that lead from the MCL back to the concentration in the soil at the source. As an example, the calculation of the groundwater protection level for lindane is described. The assumption is that the concentration in the groundwater in the surficial aquifer cannot exceed the MCL of 0.0002 mg/l. The concentration in the infiltrating water will be diluted by the groundwater in the aquifer to 0.35 percent of its value. Therefore, the infiltrating groundwater can have a concentration of 0.0002/0.35 or 0.00057 mg/l. Because of the persistence of the contaminant in the source soil, the duration of the source of lindane is very long compared to the travel time. Hence, the contaminant is modeled to reach the water table at the same concentration as it is in the source soil water, assuming no degradation has occurred. Therefore, the dispersion factor is 1.0. (This is also true for lead, arsenic, and toxaphene.) Therefore, the concentration of lindane that would be expected in the soil water at the source without considering degradation would be 0.00057 mg/l. According to the modeling (as discussed in the attachment), degradation will reduce the concentration of lindane to essentially zero

before it reaches the water table. Hence, the concentration in the soil can be well above the level defined for soil ingestion of 7 mg/kg and still be protective of groundwater quality.

**Table B-1**
**CALCULATION OF AQUIFER DILUTION FACTORS USING THE SUMMERS MODEL**

| Parameter | Surficial Aquifer |
|---|---|
| Area ($ft^2$) | 470,000[a] |
| Recharge (ft/yr) | 0.45 |
| Infiltration (Qp) ($ft^3$/yr) | 211,500 |
| Hydraulic conductivity (ft/yr) | 1,825 |
| Hydraulic gradient | 0.027 |
| Width of flow (ft) | 800 |
| Aquifer thickness (ft) | 10 |
| Aquifer flow (Qa) ($ft^3$/yr) | 394,200 |
| Initial source concentration (Cp) (mg/l) | 1 |
| Dilution factor | 0.35 |

[a]60 percent of a total site area of 784,000 $ft^2$.

The groundwater protection levels for the other contaminants shown in Table B-2 are estimated using the same process.

It is recognized that there is considerable variability in the values of fate-and-transport parameters under natural conditions. The values chosen for the modeling for the FS are believed to be representative of typical conditions in the subsurface at the site. To reduce the uncertainty associated with several of the parameters, additional investigation will be performed during the pre-design phase of the project to better define the values of some of the parameters. This investigation will include:

- Pumping tests in the surficial aquifer to better assess the hydraulic properties of the unit.

| Table B-2<br>CALCULATION OF GROUNDWATER PROTECTION LEVELS | | | | | |
|---|---|---|---|---|---|
| | Contaminant Concentration | | | | |
| | Arsenic | Lead | Lindane | Toxaphene | 1,2-DCA |
| MCL and maximum allowable concentration in the surficial aquifer (mg/l) | 0.05 | 0.015 | 0.0002 | 0.003 | 0.005 |
| Dilution factor in surficial aquifer | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 |
| Maximum allowable concentration in the infiltration into the surficial aquifer (mg/l) | 0.14 | 0.043 | 0.00057 | 0.0086 | 0.14 |
| Dispersion factor—surface to the surficial aquifer | 1.0 | 1.0 | 1.0 | 1.0 | 0.025 |
| Maximum allowable concentration in the soil water at the source (mg/l) without considering degradation | 0.14 | 0.043 | 0.00057 | 0.0086 | 0.56 |
| Reduction factor for degradation | 0.0 | 0.0 | $10^{-19}$ | 0.0067 | 0.001 |
| Distribution coefficient (ml/g) | 3,241 | 14,479 | 133 | 4,760 | 0.030 |
| Soil concentration (groundwater protection level) (mg/kg) | 454 | 623 | Well above soil ingestion level of 7 | 6,110 | 17 |

- Additional soil leaching tests for arsenic, lead, lindane, and toxaphene to better define the adsorption of these chemicals, and the rate of decline of their concentrations in the source soil.

- Laboratory studies of degradation of lindane, toxaphene, and 1,2-DCA to provide site-specific data on this parameter.

- Measurements of soil hydraulic properties to better define these parameters.

These tests will provide data to refine the input parameters and the estimation of soil cleanup levels.

WDCR660/063.51

# Appendix C
# Preliminary Identification of Action- and Location-Specific ARARs

**Table C-1**
**PRELIMINARY IDENTIFICATION OF POTENTIAL ACTION-SPECIFIC ARARs FOR WOOLFOLK CHEMICAL WORKS**



| Actions[a] | Requirement | Prerequisites | Citation | ARAR | Comments |
|---|---|---|---|---|---|
| Capping | Placement of a cap over waste (e.g., closing a landfill, or closing a surface impoundment or waste pile as a landfill, or similar action) requires a cover designed and constructed to:<br>• Provide long-term minimization of migration of liquids through the capped area<br>• Function with minimum maintenance<br>• Promote drainage and minimize erosion or abrasion of the cover<br>• Accommodate settling and subsidence so that the cover's integrity is maintained; and<br>• Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present. | Capping without disturbance will not make requirements applicable, but technical requirements are likely to be relevant and appropriate. | 40 CFR 264.228(a)[c] (Surface Impoundments)<br>40 CFR 264.258(b) (Waste Piles)<br>40 CFR 264.310(a) (Landfills) | Relevant and Appropriate | Implementation of capping in-place is an alternative for at least a portion of the site. The RCRA capping requirements would be relevant and appropriate to capping hazardous wastes in place, and could be relevant to capping non-hazardous wastes in place. A RCRA cap would serve to isolate and contain contaminated soils, and limit infiltration of precipitation if a groundwater contaminant problem exists. If the wastes are excavated and reconsolidated in their current location, the capping requirements are applicable. |
| | Eliminate free liquids, stabilize wastes before capping (surface impoundments). | | 40 CFR 264.228(a) | | |
| | Restrict post-closure use of property as necessary to prevent damage to the cover. | | 40 CFR 264.117(c) | | |
| | Prevent run-on and run-off from damaging cover. | | 40 CFR 264.228(b)<br>40 CFR 264.310(b) | | |
| | Protect and maintain surveyed benchmarks used to locate waste cells (landfills, waste piles). | | 40 CFR 264.310(b) | | |
| On-site Corrective Actions | Property notices, affidavit in county deed records, restrictive covenants. | Corrective Action Type 5 Risk Reduction Standard. | Georgia Rule 391-3-19.08 | Relevant and Appropriate | Institutional measures for establishing restrictive covenants. |

**Table C-1**
**PRELIMINARY IDENTIFICATION OF POTENTIAL ACTION-SPECIFIC ARARs FOR WOOLFOLK CHEMICAL WORKS**



| Actions[a] | Requirement | Prerequisites | Citation | ARAR | Comments |
|---|---|---|---|---|---|
| Clean Closure (Removal) | General performance standard requires minimization of need for further maintenance and control; minimization or elimination of post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products. | Disturbance of RCRA hazardous waste (listed or characteristic) and movement outside the unit or area of contamination.<br><br>May apply to surface impoundment or to contaminated soil, including soil disturbed in the course of drilling or excavation and returned to land.<br><br>Not applicable to material treated in-situ, or consolidated within area of contamination. Designed for cleanup that will not require long term management. Designed for cleanup to health-based standards. | 40 CFR 264.111 | Relevant and Appropriate | Clean closure removal is being considered for the site. The RCRA clean closure requirements would be considered relevant and appropriate to contaminated wastes which are not hazardous, but which are similar to hazardous wastes. |
| | Disposal or decontamination of equipment, structures, and soils. | May apply to structures, containers piping and contaminated soil. | 40 CFR 264.111 and 268<br>40 CFR 264.178<br>40 CFR 264.197 | Relevant and Appropriate | The RCRA Land Disposal Restrictions require treatment of RCRA wastes to specified levels or by specified technologies. The RCRA requirements would be considered relevant and appropriate to wastes that are not RCRA hazardous wastes, but which are similar (same constituents) as RCRA wastes.<br><br>RCRA Land Disposal Restrictions require treatment of RCRA wastes to specified levels or by specified technologies before land disposal. If treatment to the specified level or by the specified technology is not achievable or appropriate, a variance must be obtained from the EPA. If the wastes are determined to be RCRA wastes, these requirements would be applicable. |
| | Removal or decontamination of all waste residues, contaminated containment system components (e.g., liners, dikes), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and management of them as hazardous waste. | Disposal of RCRA hazardous waste (listed or characteristic) after disturbance and movement outside the unit or area of contamination. | 40 CFR 264.228(a)(1)<br>and<br>40 CFR 264.258 | Applicable | In the event that the wastes being removed are determined to be hazardous wastes, the requirements of this section would be applicable. |
| | Meet health-based levels at unit. | | 40 CFR 264.111 | Applicable | In the event that the wastes being removed are determined to be hazardous wastes, the requirements of this section would be applicable. |

Table C-1
PRELIMINARY IDENTIFICATION OF POTENTIAL ACTION-SPECIFIC ARARs FOR WOOLFOLK CHEMICAL WORKS



| Actions[a] | Requirement | Prerequisites | Citation | ARAR | Comments |
|---|---|---|---|---|---|
| Closure with Waste in Place (Capping) | Eliminate free liquids by removal or solidification. | Applicable to land disposal of hazardous waste. Applicable to RCRA hazardous waste (listed or characteristic) placed at the site or into another unit. Not applicable to material treated in-situ or consolidated within area of contamination. | 40 CFR 264.228(a)(2) | Relevant and Appropriate | See discussion under Capping. |
| | Stabilization of remaining waste and waste residues to support cover. | | 40 CFR 264.228(a)(2) and 40 CFR 264.258(b) | | |
| | Installation of final cover to provide long-term minimization of infiltration. | | 40 CFR 264.310 | Applicable | |
| | Post-closure care and groundwater monitoring. | | 40 CFR 264.310 | | |
| | RCRA hazardous wastes are subject to land disposal restrictions. Land disposal restrictions set performance requirements on treatment of the wastes before land disposal. The effective date for final group of RCRA wastes is May 8, 1990. Extensions to the effective dates have been granted for specific RCRA wastes that are contained in soil and/or debris. | | 40 CFR 268 | Applicable<br><br>Relevant and Appropriate | If the wastes found on the Woolfolk site are found to be RCRA wastes and are moved off the site or treated, the Land Disposal Restrictions will be applicable.<br><br>If the wastes are not RCRA wastes but contain the same or similar constituents to those in RCRA wastes, then the Land Disposal Restrictions will be relevant and appropriate. |
| Consolidation | With respect to the waste that is moved, see requirements in the following sections: Capping, Closure with Waste in Place, Container Storage, Construction of a New Landfill On-Site, Construction of a New Surface Impoundment Onsite, Incineration (Onsite), Land Treatment, Operation and Maintenance, Tank Storage, and Treatment | Movement of hazardous waste and placement in another unit. | See Capping, Closure with Waste in Place, Container Storage, Construction of a New Landfill Onsite, Construction of a New Surface Impoundment Onsite, Incineration (Onsite), Land Treatment, Operation and Maintenance, Tank Storage, and Treatment in this exhibit. | | |

Table C-1
PRELIMINARY IDENTIFICATION OF POTENTIAL ACTION-SPECIFIC ARARs FOR WOOLFOLK CHEMICAL WORKS



| Actions[a] | Requirement | Prerequisites | Citation | ARAR | Comments |
|---|---|---|---|---|---|
| Container Storage (Onsite) | Containers of RCRA hazardous waste must be: | RCRA hazardous waste (listed or characteristic) held for a temporary period before treatment, disposal, or storage elsewhere (40 CFR 264.10) in a container (i.e., any portable device in which a material is stored, transported, disposed of, or handled). | | Relevant and Appropriate | These requirements would be relevant and appropriate for any non-hazardous waste which might be containerized and stored onsite prior to treatment or final disposal. |
| | • Maintained in good condition | | 40 CFR 264.171 | | |
| | • Compatible with hazardous waste to be stored | | 40 CFR 264.172 | Applicable | If any of the wastes are determined to be classified as hazardous wastes, the requirements would be applicable. Containerized hazardous substances or hazardous wastes must be stored while onsite in a structure that is designed, operated, and maintained in accordance with 40 CFR 264.171-178. |
| | • Closed during storage (except to add or remove waste) | | 40 CFR 264.173 | | |
| | Inspect container storage areas weekly for deterioration. | | 40 CFR 264.174 | | |
| | Place containers on a sloped, crack-free base, and protect from contact with accumulated liquid. Provide containment system with a capacity of 10 percent of the volume of containers of free liquids. Remove spilled or leaked waste in a timely manner to prevent overflow of the containment system. | | 40 CFR 264.175 | | |
| | Keep containers of ignitable or reactive waste at least 50 feet from the site's property line. | | 40 CFR 264.176 | | |
| | Keep incompatible materials apart. Separate incompatible materials stored near each other by a dike or other barrier. | | 40 CFR 264.177 | | |
| | At closure, remove all hazardous waste and residues from the containment system, and decontaminate or remove all containers, liners. | | 40 CFR 264.178 | | |
| Construction of New Landfill Onsite (See Closure with Waste in Place) | Install two liners or more, a top liner that prevents waste migration into the liner, and a bottom liner that prevents waste migration through the liner. | RCRA hazardous waste (listed or characteristic) currently being placed in a landfill. | 40 CFR 264.301 | Relevant and Appropriate | This replacement regulates the design, construction, operation, and maintenance of a new hazardous waste landfill. Reconsolidation and placement of wastes in a previously contaminated area are discussed under Capping, Closure With Waste In-Place, and Hybrid Closure. |
| | Install leachate collection systems above and between the liners. | | 40 CFR 264.301 | Relevant and Appropriate | This requirement would be relevant and appropriate to the construction, operation, and maintenance of a new landfill. |
| | Construct run-on and run-off control systems capable of handling the peak discharge of one 25-year storm. | | 40 CFR 264.301 | Applicable | If any of the excavated wastes are determined to be hazardous wastes, these requirements would be applicable. |

**Table C-1**
**PRELIMINARY IDENTIFICATION OF POTENTIAL ACTION-SPECIFIC ARARs FOR WOOLFOLK CHEMICAL WORKS**



| Actions[a] | Requirement | Prerequisites | Citation | ARAR | Comments |
|---|---|---|---|---|---|
| Construction of New Landfill Onsite (See Closure with Waste in Place) (Continued) | Control wind dispersal of particulates. | | 40 CFR 264.301 | | |
| | Inspect liners and covers during and after installation. | | 40 CFR 264.303 | | |
| | Inspect site weekly and after storms to detect malfunction of control systems or the presence of liquids in the leachate collection and leak detection systems. | | 40 CFR 264.303 | | |
| | Maintain records of the exact location, dimensions, and contents of waste cells. | | 40 CFR 264.304 | | |
| | Close each cell with a final cover after the last waste has been received. | | 40 CFR 264.310 | | |
| | No bulk or non-containerized liquid hazardous waste or hazardous waste containing free liquids may be disposed of in landfills. | | 40 CFR 264.314 | | |
| | Containers holding free liquids may not be placed in a landfill unless the liquid is mixed with an absorbent or solidified. | | 40 CFR 264.314 | | |
| | Treatment by Best Demonstrated Available Technology before placement. | Placement, after November 8, 1988, of RCRA hazardous waste is subject to land disposal restrictions. | 40 CFR 268 | Relevant and Appropriate | RCRA Land Disposal Restriction requirements may be relevant and appropriate to some non-hazardous wastes that are contaminated with the hazardous constituents of the restricted wastes. The Land Disposal Restrictions specify either concentrations of hazardous constituents above which the waste cannot be land disposed, or technologies that must be used to treat the waste before land disposal. |
| | | | | Applicable | If any of the excavated wastes are determined to be hazardous wastes subject to the Land Disposal Restrictions, these requirements will be applicable. In that case, the wastes will have to be treated to the specified level, or a variance granted. |
| | Devise fugitive dust and odor emission control plan for this action if existing site plan is inadequate. | | CAA Section 101[b] and 40 CFR 52[b] | Applicable | Dust and odor regulations are intended to limit nuisance conditions from air pollution emissions. |

Table C-1
PRELIMINARY IDENTIFICATION OF POTENTIAL ACTION-SPECIFIC ARARs FOR WOOLFOLK CHEMICAL WORKS



| Actions[a] | Requirement | Prerequisites | Citation | ARAR | Comments |
|---|---|---|---|---|---|
| Construction of New Landfill Onsite (See Closure with Waste in Place) (Continued) | Georgia-registered professional engineer must design a landfill in accordance with the following criteria:<br>• A 200-foot buffer between the waste disposal boundary and property line<br>• A 500-foot buffer between the waste disposal boundary and any occupied dwelling (the buffer may be reduced by a waiver signed by the owner of the dwelling)<br>Site survey control shall be provided.<br>A uniform compacted layer of clean earth cover not less than 2 feet thick and a vegetative cover must be placed over the landfill. | Disposal of solid waste into a landfill. | GA 391-3-4.07<br>GA SWMD Municipal Solid Waste Landfill Liner Design System Criteria, 9/91 | To be considered. | |
| Excavation | Area from which materials are excavated may require cleanup to levels established by closure requirements. | Disposal by disturbance of hazardous waste and moving it outside the unit or area of contamination. | 40 CFR 264 Disposal and Closure Requirements | Relevant and Appropriate<br>Applicable | If contaminated materials that are not hazardous wastes are excavated from the site during remediation, the RCRA requirements for disposal and site closure (of the excavated area) become relevant and appropriate. See discussions under Capping, Clean Closure, Closure with Waste In-Place, etc.<br>If the excavated materials can be classified as hazardous wastes, the disposal and closure requirements would be applicable. |
| | Movement of excavated materials to a previously uncontaminated, onsite location, and placement in or on land may trigger land disposal restrictions. | Materials containing RCRA hazardous wastes subject to land disposal restrictions. | 40 CFR 268 (Subpart D) | Relevant and Appropriate<br>Applicable | The land disposal restrictions restrict disposal of certain hazardous wastes. Some wastes may be derived from or may be sufficiently similar to restricted wastes to make the land disposal restrictions relevant and appropriate.<br>For wastes that can be classified as restricted hazardous wastes, the restrictions are applicable after November 8, 1988. After this date, land disposal is prohibited for these wastes unless they are treated to defined standards. Chemical characterization of the wastes will be necessary to determine the applicability or relevance of this requirement. |
| | Devise fugitive dust and odor emission control plan for this action if existing site plan is inadequate. | | CAA Section 101[b] and 40 CFR 52[b] | Applicable | See discussions under Construction of new landfill. |

**Table C-1**
**PRELIMINARY IDENTIFICATION OF POTENTIAL ACTION-SPECIFIC ARARs FOR WOOLFOLK CHEMICAL WORKS**



| Actions* | Requirement | Prerequisites | Citation | ARAR | Comments |
|---|---|---|---|---|---|
| Operation and Maintenance (O&M) | Post-closure care to ensure that site is maintained and monitored. | | 40 CFR 264.1 | Relevant and Appropriate<br><br>Applicable | Post-closure requirements for operation and maintenance of the Woolfolk site are relevant and appropriate to new disposal units with non-hazardous waste, or existing units capped in-place.<br><br>In cases where the wastes are determined to be hazardous wastes, and new disposal units are created, the post-closure requirements will be applicable. |
| Surface Water Control | Prevent run-on, and control and collect runoff from a 24-hour, 25-year storm (waste piles, land treatment facilities, landfills). | Land-based treatment, storage, or disposal units. | 40 CFR 264.251(c)(d)<br><br>40 CFR 264.273(c)(d)<br><br>40 CFR 264.301(c)(d) | Relevant and Appropriate<br><br>Applicable | The requirements for control of run-on and run-off will be relevant and appropriate to all remediation alternatives that manage non-hazardous waste and include onsite land-based treatment, storage, or disposal.<br><br>The requirements will be applicable to any remediation measures that include land-based treatment, storage, or disposal of hazardous wastes. |
| Tank Storage (Onsite) | Tanks must have sufficient structural strength to ensure that they do not collapse, rupture, or fail.<br><br>Waste must not be incompatible with the tank material unless the tank is protected by a liner or by other means.<br><br>Tanks must be provided with secondary containment and controls to prevent overfilling, and sufficient freeboard maintained in open tanks to prevent overtopping by wave action or preciptation.<br><br>Impact the following: overfilling control, control equipment, monitoring data, waste level (for uncovered tanks), tank condition, above-ground portions of tanks (to assess their structural integrity), and the area surrounding the tank (to identify signs of leakage).<br><br>Repair any corrosion, crack, and leak.<br><br>At closure, remove all hazardous waste and hazardous waste residues from tanks, discharge control equipment, and discharge confinement structures. | Storage of RCRA hazardous waste (listed or chacteristic) not meeting small quantity generator criteria held for a temporary period greater than 90 days before* treatment, disposal, or storage elsewhere (40 CFR 264.10), in a tank (i.e., any portable device in which a material is stored, transported, disposed of, or * handled). A generator who accumulates or stores hazardous waste on-site for 90 days or less in compliance with 40 CFR 262.34(a)(1-4) is not subject to full RCRA storage requirements. Small quantity generators are not subject to the 90 day * limit (40 CFR 262.34(c), (d), and (e)). | 40 CFR 264.191<br><br>40 CFR 264.191<br><br>40 CFR 264.193-194<br><br>40 CFR 264.195<br><br>40 CFR 264.196<br><br>40 CFR 264.197 | Aplicable | These requirements would be applicable to the construction and use of tank storage at Woolfolk. |

**Table C-1**
**PRELIMINARY IDENTIFICATION OF POTENTIAL ACTION-SPECIFIC ARARs FOR WOOLFOLK CHEMICAL WORKS**



| Actions* | Requirement | Prerequisites | Citation | ARAR | Comments |
|---|---|---|---|---|---|
| Tank Storage (Onsite) (continued) | Store ignitable and reactive waste so as to prevent the waste from igniting or reacting. Ignitable or reactive wastes in covered tanks must comply with buffer zone requirements in "Flammable and Combustible Liquids Code." Tables 2-1 through 2-6 (National Fire Protection Association, 1976 or 1981). | | 40 CFR 264.198 | | |
| | Storage Prohibitions:<br><br>Storage of banned wastes must be in accordance with 40 CFR 268. When such storage occurs beyond one year, the owner/operator bears the burden of providing that such storage is solely for the purpose of accumulating sufficient quantities to allow for proper recovery, treatment, and disposal. | | 40 CFR 268.50 | | |
| Treatment | Standards for miscellaneous units (long-term retrievable storage, thermal treatment other than incinerators, open burning, open detonation, chemical, physical, and biological treatment units using other than tanks, surface impoundments, or land treatment units) require new miscellaneous units to satisfy environmental performance standards by protection of groundwater, surface water, and air quality, and by limiting surface and subsurface migration. | Use of other units for treatment of hazardous wastes. These units do not meet the definitions for units regulated elsewhere under RCRA. | 40 CFR 264 (Subpart X) | Relevant and Appropriate<br><br>Applicable | The requirement will be relevant and appropriate to the construction, operation, maintenance, and closure of any miscellaneous treatment unit (a treatment unit that is not elsewhere regulated) constructed on the PGDP site for treatment and/or disposal of non-hazardous wastes.<br><br>These requirements would be applicable to the construction and operation of a miscellaneous treatment unit for the treatment and/or disposal of hazardous wastes. |
| | Treatment of wastes subject to ban on land disposal must attain levels achievable by best demonstrated available treatment technologies (BDAT) for each hazardous constituent in each listed waste. | Effective date for CERCLA actions is November 8, 1988, for F001-F005 hazardous wastes, dioxin wastes, and certain "California List" wastes. Other restricted wastes have different effective dates as promulgated in 40 CFR 268. | 40 CFR 268 (Subpart D) | Applicable<br><br>Relevant and Appropriate | These regulations are applicable to the disposal of any waste that can be defined as restricted wastes.<br><br>These requirements are relevant and appropriate to the treatment prior to land disposal of any wastes that contain components of restricted wastes in concentrations that make the site wastes sufficiently similar to the regulated wastes. The requirements specify levels of treatment that must be attained prior to land disposal. |

**Table C-1**
**PRELIMINARY IDENTIFICATION OF POTENTIAL ACTION-SPECIFIC ARARs FOR WOOLFOLK CHEMICAL WORKS**



| Actions[a] | Requirement | Prerequisites | Citation | ARAR | Comments |
|---|---|---|---|---|---|
| Treatment (continued) | Design and operating standards for unit in which hazardouds waste is treated. | Treatment of hazardous waste in a unit. | 40 CFR 264.190-264.192 (Tanks)<br><br>40 CFR 264.601 (Miscellaneous Treatment Units)<br><br>40 CFR 265.373 (Thermal Treatment Units) | Applicable<br><br>Relevant and Appropriate | These regulations are applicable to the disposal of hazardous waste.<br><br>These requirements are relevant and appropriate for design and operation of treatment units which treat non-RCRA hazardous waste. |
| | Devise fugitive and odor emission control plan for this action. | | CAA Section 101[b] and 40 CFR 52[b] | Applicable | See discussions under Air Stripping. |
| | File an Air Pollution Emission Notice (APEN) with state to include estimation of emission rates for each pollutant expected. | | 40 CFR 52[b] | Applicable | See discussions under Air Stripping. |

**NOTES:**

[a]Action alternatives from ROD keyword index.
[b]All of the Clean Air Act ARARs that have been established by the Federal Government are covered by matching state regulations. The state has the authority to manage these programs through the approval of its implementation plans (40 CFR 52, Subpart G).
[c]Bulk storage requires the preparation and implementation of a spill prevention, control, and countermeasures (SPCC) plan (see 40 CFR 761.65(c)(7)(ii) for specifications of container sizes that are considered "bulk" storage containers). Substantive requirements may be ARARs if bulk storage is performed on the site.
[d]Class I wells and Class IV wells are the relevant classifications for CERCLA. Class I wells are used to inject hazardous waste beneath the lowermost formation containing an underground source of drinking water within one-quarter mile of the injection well. Class IV wells are used to inject hazardous or radioactive waste into or above a formation containing an underground source of drinking water within one-quarter mile of the injection well.
[e]These regulations apply regardless of whether the remedial action discharges into the sewer or trucks the waste to an inlet to the sewage conveyance system located "upstream" of the town.

DRAFT

# Appendix D
# Material Quantity Estimates

## Appendix D
# On-Site Soil Management Estimates

| Areas | $Ft^2$ | Depth of Excavation (ft) | Volume ($yd^3$) |
|---|---|---|---|
| Bld W | 49,000 | 1 | 1,800 |
| Jacobs Alley | 17,000 | - | - |
| Machine Shop | 16,000 | 1 | 600 |
| Marion Allen | 30,000 | 1 | 300 |
| | | 4 | 3,200 |
| Limehouse | 11,000 | 1 | 400 |
| E. of Cap | 1,000 | 1 | 50 |
| S. of Cap to Bld T and N from RR | 50,000 | 1 | 800 |
| | | 4 | 300 |
| | | 5 | 2,400 |
| | | 8 | 3,900 |
| Tanks and Bld F | 6,000 | 2 | 400 |
| Bld S | 1,000 | 5 | 200 |
| S. of Bld T | 22,000 | 1 | 800 |
| Pecan Orchard | 84,000 | 1 | 3,000 |
| | | 4 | 300 |
| | 287,000 | | 18,500 |

# Alternative 2

# Land Improvements for Commercial/Industrial Development

## Asphalt Pave

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E. of | | Machine | | Marion | | | | Pecan | | 74% | | Jacobs |
| Cap | + | Shop | + | Allen | + | Tanks | + | Orchard | + | Bldg W | + | Allen |
| 1,000 | + | 16,000 | + | 30,000 | + | 6,000 | + | 84,000 | + | 36,000 | + | 17,000 |

190,000 $ft^2$

## Concrete Pave

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 26% | | | | S. of | | | | S. of |
| Bldg W | + | Limehouse | + | Cap | + | Bldg S | + | Bldg T |
| 13,000 | + | 11,000 | + | 50,000 | + | 1,000 | + | 22,000 |

97,000 $ft^2$

## Excavate to Pave

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Machine | | Marion | | S. of | | | | | | S. of | | |
| Shop | + | Allen | + | Cap | + | Limehouse | | | + | Bldg T | + | Bldg W |
| 16,000 | + | 30,000 | + | 50,000 | + | 11,000 | | | + | 22,000 | + | 49,000 |

178,000 $ft^2$ x 0.5 ft = 89,000 $ft^3$ = 3,300 $yd^3$

# Alternative 3
# On-Site Subtitle C Landfill

## Asphalt Pave Over

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Machine | | Jacobs | | E. of | | 29% of | | |
| Shop | + | Alley | + | Cap | + | Marion Allen | + | Tanks |
| 16,000 | + | 17,000 | + | 1,000 | + | 9,000 | + | 6,000 |

49,000 $ft^2$

## Concrete Over

| | | | | |
|---|---|---|---|---|
| S. of | | | | |
| Bldg T | + | Limehouse | + | Bldg S |
| 22,000 | + | 11,000 | + | 1,000 |

34,000 $ft^2$

## Excavate

for paving of ½

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Machine | | 29% Marion | | | | S. of | | | | |
| Shop | + | Allen | + | Tanks | + | Bldg T | + | Limehouse | + | Bldg S |
| (16,000 | + | 9,000 | + | 6,000 | + | 22,000 | + | +11,000 | + | 1,000) |

= 32,500 $ft^3$ = 1,200 $yd^3$

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 71 % Marion | | S. of | | | | Pecan |
| Bldg W | + | Allen | + | Cap | | | + | Orchard |
| 18,000 $yd^3$ | | 3,200 $yd^3$ | + | 800 + 300 + 2,400 + +3,900 | | | + | 3,300 $yd^3$ |

Total = 16,900 $yd^3$

## Additional Concrete

| | | | | |
|---|---|---|---|---|
| 26% Bldg W | + | S. of Cap | | |
| 13,000 | + | 50,000 | = | 63,000 $ft^2$ |

Total Concrete 63,000 + 34,000 = 97,000 $ft^2$

## Asphalt

| | | | | |
|---|---|---|---|---|
| Cap | + | 71% Marion Allen | | |
| 84,000 | + | 21,000 | = | 105,000 |

Total Asphalt = 105,000 + 49,000 = 154,000 $ft^2$

## Backfill

| | | Asphalt | | | Concrete |
|---|---|---|---|---|---|
| 15,700 $yd^3$ | - | (105,000 $ft^2$) | ½ft | - | 63,000 $ft^3$ |
| 15,700 $yd^3$ | - | 1,900 $yd^3$ | | - | 2,300 $yd^3$ |
| 11,500 $yd^3$ | | | | | |

# Alternative 4
# S/S Treatment of Hazardous Soil and On-Site Subtitle C Landfill

All estimates are the same as Alternative 3 except:

5,700 $yd^3$ will be treated

## Volume to Landfill

16,900 $yd^3$ - 5,700 $yd^3$ + 5,700 $yd^3$ x 1.25
18,300 $yd^3$

## Total Asphalt

154,000 - 84,000 = 70,000 $ft^2$

# Alternative 5
# In Situ S/S Treatment

## In Situ Treatment

expands material by 25%

Asphalt over 49,000 $ft^2$ + ½ Pecan Orchard (84,000 $ft^2$) = 91,000 $ft^2$

Concrete over 34,000 $ft^2$

Excavate for paving 2,000 $yd^3$

Excavate ½ of Pecan Orchard 1,600 $yd^3$

Material to treat in situ

Bldg W + 71% MA + S. of Cap - Additional Asphalt and Concrete

0.75 (1,800 + 3,200 + 8,000 + 300 + 2,400 + 3,900) - 2,700 = 6,600 $yd^3$

## Excavate

25% of in situ treatment + add. concrete _ add. asphalt

0.25 (12,400 $yd^3$) + (63,000 $ft^3$ + 21,000 $ft^2$ x ½ ft)/ 27

3,100 - 2,700

## Total Excavation

3,100 + 2,700 + 1,600 + 2,000 = 9,400 $yd^3$

Volume after ex situ treatment = 11,800 $yd^3$

Total Asphalt = 102,000 $ft^2$

Total Concrete = 97,000 $ft^2$

# Alternative 6

# On-Site Subtitle C and Subtitle D Landfills

See Alternative 3

Pave Over = 49,000 $ft^2$

Concrete Over = 34,000 $ft^2$

Excavate for Paving = 1,200 $yd^3$

Excavate for disposal = 8,100 $yd^3$ (cap) + 15,700 (other) = 23,800 $yd^3$

Total Excavate = 25,000 $yd^3$

To haz. landfill = 8,100 + 5,700 = 13,800 $yd^3$

To nonhaz. landfill = 11,200 $yd^3$

Additional Concrete = 63,000 $ft^2$

Additional Asphalt = 21,000 $ft^2$

Total Concrete = 97,000 $ft^2$

Total Asphalt = 70,000 $ft^2$

## Backfill

15,700 $yd^3$ - 21,000 $ft^2$ x ½ ft - 63,000 $ft^3$

13,000 $yd^3$

# Alternative 7

# S/S Treatment of Hazardous Soil and Off-Site Landfill

See Alternative 3 and 6

Asphalt over = 49,000 $ft^2$

Concrete over = 34,000 $ft^2$

Total Excavation = 25,000 $yd^3$

Haz. = 13,800 $yd^3$

Nonhaz = 11,200 $yd^3$

Additional Concrete = 63,000 $ft^2$

Total Concrete = 97,000 $ft^2$

Additional Asphalt = 21,000 $ft^2$

Total Asphalt = 70,000 $ft^2$

## Backfill

13,000 $yd^3$ + 8,100 $yd^3$ = 21,100 $yd^3$

# Material Under Existing Cap

| area ($ft^2$) | depth (ft) | $\Delta$ from 6 ft |
|---|---|---|
| 1,400 | 16 | 10 |
| 5,900 | 11 | 5 |
| 11,900 | 8 | 2 |
| 13,200 | 6 | 0 |

$(13{,}200 \times 6) + (11{,}900 \times 2) + (5{,}900 \times 5) + (1{,}400 \times 10) = 146{,}500\ ft^3 = 5{,}400\ yd^3$

assume 50% contingency

$5{,}400\ yd^3 \times 1.5 = 8{,}100\ yd^3$

# Structure Demolition Quantity

## Building W

Assume 75′ x 75′ = 5,625 $ft^2$

Assume floor = 3″ thick

5,625 x 3/12 = 1,406 $ft^3$ floor

Assume foundation = 1.5′ x 1.5′ x 2′ pilings every 10′ around perimeter = 24(1.5 x 1.5 x 2) = 108 $ft^3$ foundation

Assume roof slope = 20°

$\ell$ = 75/cos20° = 80 ft

Assume roof = 2″ thick = 0.167′

80 x 75 x 0.167 = 1,002 $ft^3$ roof

Assume walls = 3″ thick

Assume average height = 30′

4(75 x 30 x 0.25) = 2,250 $ft^3$ walls

Assume 10 beams that run length of building

10(1′ x 0.5′ x 75′) = 375 $ft^3$ beams

Total $\simeq$ 5,150 $ft^3$ Add 20 percent misc. interior

$\simeq$ 6,200 $ft^3$ $\simeq$ 230 cy or 460 cy with 50 percent void

Assume 1.5 tons/cy = 345 tons

WDCR860/019.WP5

# Appendix E
# Detailed Cost Estimates

**ESTIMATE SUMMARY**

**PROJECT:** Woolfolk Chemical Works **BY: JJB/CFB**
**DESCRIPTION:** On-Site Soil Alternatives
**ALTERNATIVE :** ON-2: Land Improvements for Commercial/Industrial Development

| DESCRIPTION | QTY | UNIT | INSTALLED COSTS UNITS | INSTALLED COSTS AMOUNT | CONTINGENCY 20.00% | MOB/BOND/INS 3.00% | OH & P 16.00% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Delineate Hazardous Soil** | | | | | | | | |
| TCLP | 50 | EA | $1,000 | $50,000 | $10,000 | $3,000 | $9,450 | $72,450 |
| **Excavation for Improvements** | | | | | | | | |
| 6" Depth | 3,300 | CY | $2.50 | $8,250 | $1,650 | $495 | $1,559 | $11,954 |
| Haul Excavated Debris to Non-hazardous Landfill | 3,300 | CY | $50.00 | $165,000 | $33,000 | $9,900 | $31,185 | $239,085 |
| **Tree Removal and Disposal** | | | | | | | | |
| Pecan Orchard Trees | 30 | EA | $600.00 | $18,000 | $3,600 | $1,080 | $3,402 | $26,082 |
| **Portland Concrete Cap** | | | | | | | | |
| Heavily Trucked Areas | 97,000 | SF | | | | | | |
| 10" Concrete Slab | 3,000 | CY | $175.00 | $525,000 | $105,000 | $31,500 | $99,225 | $760,725 |
| Compaction | 3,000 | CY | $1.50 | $4,500 | $900 | $270 | $851 | $6,521 |
| **Hydraulic Asphalt Cap** | | | | | | | | |
| Auto Use Areas | 190,000 | SF | | | | | | |
| 4" Hydraulic Asphalt | 21,111 | SY | $8.50 | $179,444 | $35,889 | $10,767 | $33,915 | $260,015 |
| 2" Base Aggregate | 1,173 | CY | $15.00 | $17,593 | $3,519 | $1,056 | $3,325 | $25,492 |
| Compaction | 1,173 | CY | $1.50 | $1,759 | $352 | $106 | $333 | $2,549 |
| Subtotal | | | | $919,546 | $183,909 | $55,173 | $173,794 | $1,404,873 |
| **vel of Protection** | | | | | | | | |
| Level D (75%) | | N/A | | | | | | |
| Level C (25%) | 20.00% | LS | | | | | | $70,244 |
| **Health & Safety** | | | | | | | | |
| Initial | 1 | LS | $13,000 | $13,000 | $2,600 | $780 | $2,457 | $18,837 |
| During Construction | 1 | LS | $19,000 | $19,000 | $3,800 | $1,140 | $3,591 | $27,531 |
| TOTAL | | | | | | | | $1,521,000 |

**PROJECT:** Woolfolk Chemical Works
**DESCRIPTION:** On-Site Soil Alternatives
**ALTERNATIVE :** ON-3: On-Site Subtitle C Landfill with Asphalt Cap

**BY: JJB/CFB**

| DESCRIPTION | QTY | UNIT | MATERIAL COSTS UNIT | MATERIAL COSTS TOTAL | CONTRACTOR | MOBILIZATION | OH & P | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Excavation Soil and Debris** | | | | | | | | |
| 0-1' Depth | 9,600 | CY | $3.00 | $28,800 | $8,640 | $1,872 | $5,897 | $46,209 |
| 1-4' Depth | 5,300 | CY | $4.00 | $21,200 | $6,360 | $1,378 | $4,341 | $33,279 |
| 4-8' Depth | 2,000 | CY | $5.00 | $10,000 | $3,000 | $650 | $2,048 | $15,698 |
| TOTAL | 16,900 | CY | | | | | | |
| **Tree Removal and Disposal** | | | | | | | | |
| Pecan Orchard Trees | 30 | EA | $600.00 | $18,000 | $5,400 | $1,170 | $3,686 | $28,256 |
| **Construct Subtitle C Landfill** | | | | | | | | |
| Excavation | 26,100 | CY | $3.50 | $91,350 | $27,405 | $5,938 | $18,704 | $143,397 |
| Excess Clean-Fill Hauling/Disposal county landfill | 22,300 | CY | $10.00 | $223,000 | $66,900 | $14,495 | $45,659 | $350,054 |
| Liner System | | | | | | | | |
| Geotextile | 6,950 | SY | $1.50 | $10,425 | $3,128 | $678 | $2,135 | $16,365 |
| Sand Drainage Layer (Imported) | 2,320 | CY | $6.50 | $15,080 | $4,524 | $980 | $3,088 | $23,672 |
| Geotextile | 6,950 | SY | $1.50 | $10,425 | $3,128 | $678 | $2,135 | $16,365 |
| 60 mil - HDPE Liner | 62,500 | SF | $0.75 | $46,875 | $14,063 | $3,047 | $9,598 | $73,582 |
| Geotextile | 6,950 | SY | $1.50 | $10,425 | $3,128 | $678 | $2,135 | $16,365 |
| Sand Drainage Layer (Imported) | 2,320 | CY | $6.50 | $15,080 | $4,524 | $980 | $3,088 | $23,672 |
| 60 mil - HDPE Liner | 62,500 | SF | $0.75 | $46,875 | $14,063 | $3,047 | $9,598 | $73,582 |
| Clay Layer | 6,950 | CY | $12.00 | $83,400 | $25,020 | $5,421 | $17,076 | $130,917 |
| Prepared Subbase | 1,500 | CY | $1.50 | $2,250 | $675 | $146 | $461 | $3,532 |
| Monitoring Pipes (4" HDPE) | 500 | LF | $7.50 | $3,750 | $1,125 | $244 | $768 | $5,887 |
| Leachate Collection Piping (4" HDPE | 500 | LF | $7.50 | $3,750 | $1,125 | $244 | $768 | $5,887 |
| Asphalt Cap Over Landfill | 70,000 | SF | | | | | | |
| 4" Hydraulic Asphalt | 7,800 | SY | $8.50 | $66,300 | $19,890 | $4,310 | $13,575 | $104,074 |
| 10" Base Aggregate | 2,200 | CY | $15.00 | $33,000 | $9,900 | $2,145 | $6,757 | $51,802 |
| Compaction | 2,200 | CY | $1.50 | $3,300 | $990 | $215 | $676 | $5,180 |
| Fence (Security) - Chain Link | 1,400 | LF | $15.00 | $21,000 | $6,300 | $1,365 | $4,300 | $32,965 |
| Placement of Soil in Landfill | 16,900 | CY | $5.00 | $84,500 | $25,350 | $5,493 | $17,301 | $132,644 |
| **Portland Concrete Cap** | | | | | | | | |
| Heavily Trucked Areas | 97,000 | SF | | | | | | |
| 10" Concrete Slab | 3,000 | CY | $175.00 | $525,000 | $157,500 | $34,125 | $107,494 | $824,119 |
| Compaction | 3,000 | CY | $1.50 | $4,500 | $1,350 | $293 | $921 | $7,064 |
| **Hydraulic Asphalt Cap** | | | | | | | | |
| Auto Use Areas | 70,000 | SF | | | | | | |
| 4" Hydraulic Asphalt | 7,800 | SY | $8.50 | $66,300 | $19,890 | $4,310 | $13,575 | $104,074 |
| 10" Base Aggregate | 2,200 | CY | $15.00 | $33,000 | $9,900 | $2,145 | $6,757 | $51,802 |
| Compaction | 2,200 | CY | $1.50 | $3,300 | $990 | $215 | $676 | $5,180 |
| **Backfill Excavated Areas** | | | | | | | | |
| Backfill with Imported Fill | 11,500 | CY | $10.00 | $115,000 | $34,500 | $7,475 | $23,546 | $180,521 |
| Subtotal | | | | $1,595,885 | $478,766 | $103,733 | $326,757 | $2,505,140 |
| **Level of Protection** | | | | | | | | |
| Level D (75%) | | N/A | | | | | | |
| Level C (25%) | 20.00% | LS | | | | | | $125,257 |
| **Health & Safety** | | | | | | | | |
| Initial | 1 | LS | $13,000 | $13,000 | $3,900 | $845 | $2,662 | $20,407 |
| During Construction | 1 | LS | $53,000 | $53,000 | $15,900 | $3,445 | $10,852 | $83,197 |
| **TOTAL** | | | | | | | | $2,734,000 |

**ESTIMATE SUMMARY**

**PROJECT:** Woolfolk Chemical Works **BY: JJB/CFB**
**DESCRIPTION:** On-Site Soil Alternatives
**ALTERNATIVE :** ON-4: Soil S/S, & Backfill

| DESCRIPTION | QTY | U N I T | INSTALLED COSTS UNIT | INSTALLED COSTS AMOUNT | CONTINGENCY 40.00% | UNCLASSIFIED 5.00% | OH & P 15.00% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Delineate Hazardous Soil** | | | | | | | | |
| TCLP | 100 | EA | $1,000 | $100,000 | $40,000 | $7,000 | $22,050 | $169,050 |
| **Excavation Soil and Debris** | | | | | | | | |
| 0-1' Depth | 9,600 | CY | $3.00 | $28,800 | $11,520 | $2,016 | $6,350 | $48,686 |
| 1-4' Depth | 5,300 | CY | $4.00 | $21,200 | $8,480 | $1,484 | $4,675 | $35,839 |
| 4-8' Depth | 2,000 | CY | $5.00 | $10,000 | $4,000 | $700 | $2,205 | $16,905 |
| TOTAL | 16,900 | CY | | | | | | |
| **Tree Removal and Disposal** | | | | | | | | |
| Pecan Orchard Trees | 30 | EA | $600.00 | $18,000 | $7,200 | $1,260 | $3,969 | $30,429 |
| **Soil S/S** | 16,900 | CY | | | | | | |
| | 25,350 | TON | $180.00 | $4,563,000 | $1,825,200 | $319,410 | $1,006,142 | $7,713,752 |
| **Backfill** | | | | | | | | |
| Treated Soil (25% expansion) | 21,125 | CY | $5.00 | $105,625 | $42,250 | $7,394 | $23,290 | $178,559 |
| **Multimedia Cap** | | | | | | | | |
| Impermeable Cover (Pecan Orchard & Building "W") | | | | | | | | |
| | 110,000 | SF | | | | | | |
| 6" Topsoil/Seeding | 2,100 | CY | $12.50 | $26,250 | $10,500 | $1,838 | $5,788 | $44,376 |
| 18" Clean Imported Fill (Veg.) | 6,200 | CY | $10.50 | $65,100 | $26,040 | $4,557 | $14,355 | $110,052 |
| Geomembrane Drainage | 110,000 | SF | $0.50 | $55,000 | $22,000 | $3,850 | $12,128 | $92,978 |
| 60 mil - HDPE Liner | 110,000 | SF | $0.75 | $82,500 | $33,000 | $5,775 | $18,191 | $139,466 |
| 24" Clay Layer | 8,200 | CY | $12.00 | $98,400 | $39,360 | $6,888 | $21,697 | $166,345 |
| 12" Prepared Subgrade | 4,100 | CY | $2.50 | $10,250 | $4,100 | $718 | $2,260 | $17,328 |
| Compaction | 4,100 | CY | $1.50 | $6,150 | $2,460 | $431 | $1,356 | $10,397 |
| Fence (Security) - Chain Link | 2,200 | LF | $15.00 | $33,000 | $13,200 | $2,310 | $7,277 | $55,787 |
| **Portland Concrete Cap** | | | | | | | | |
| Heavily Trucked Areas | 97,000 | SF | | | | | | |
| 10" Concrete Slab | 3,000 | CY | $175.00 | $525,000 | $210,000 | $36,750 | $115,763 | $887,513 |
| Compaction | 3,000 | CY | $1.50 | $4,500 | $1,800 | $315 | $992 | $7,607 |
| **Hydraulic Asphalt Cap** | | | | | | | | |
| Auto Use Areas | 70,000 | SF | | | | | | |
| 4" Hydraulic Asphalt | 7,800 | SY | $8.50 | $66,300 | $26,520 | $4,641 | $14,619 | $112,080 |
| 10" Base Aggregate | 2,200 | CY | $15.00 | $33,000 | $13,200 | $2,310 | $7,277 | $55,787 |
| Compaction | 2,200 | CY | $1.50 | $3,300 | $1,320 | $231 | $728 | $5,579 |
| Subtotal | | | | $5,855,375 | $2,342,150 | $409,876 | $1,291,110 | $9,898,511 |
| **Level of Protection Productivity** | | | | | | | | |
| Level D (50%) | | N/A | | | | | | |
| Level C (50%) | 20.00% | LS | | | | | | $989,851 |
| **Health & Safety** | | | | | | | | |
| Initial | 1 | LS | $13,000 | $13,000 | $5,200 | $910 | $2,867 | $21,977 |
| During Construction | 1 | LS | $77,000 | $77,000 | $30,800 | $5,390 | $16,979 | $130,169 |
| **TOTAL** | | | | | | | | $11,041,000 |

ESTIMATE SUMMARY

**PROJECT:** Woolfolk Chemical Works **BY: JJB/CFB**
**DESCRIPTION:** On-Site Soil Alternatives
**ALTERNATIVE :** ON-5: In-Situ S/S Treatment

| DESCRIPTION | QTY | U M T | INSTALLED COSTS UNITS | INSTALLED COSTS AMOUNT | CONTINGENCY 40.00% | MOB/BOND/INS 5.00% | OH & P 14.00% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Delineate Hazardous Soil** | | | | | | | | |
| TCLP | 100 | EA | $1,000 | $100,000 | $40,000 | $7,000 | $22,050 | $169,050 |
| **Tree Removal and Disposal** | | | | | | | | |
| Pecan Orchard Trees | 30 | EA | $600.00 | $18,000 | $7,200 | $1,260 | $3,969 | $30,429 |
| **Excavate Soil and Debris** | | | | | | | | |
| Excavate Soil and Debris | 9,400 | CY | $4.00 | $37,600 | $15,040 | $2,632 | $8,291 | $63,563 |
| **Soil and Debris S/S** | 9,400 | CY | | | | | | |
| | 14,100 | TN | $180.00 | $2,538,000 | $1,015,200 | $177,660 | $559,629 | $4,290,489 |
| **In-Situ Soil S/S** | 6,600 | CY | | | | | | |
| | 9,900 | TON | $150.00 | $1,485,000 | $594,000 | $103,950 | $327,443 | $2,510,393 |
| **On-Site Subtitle D Landfill** | | | | | | | | |
| Excavation | 9,000 | CY | $3.50 | $31,500 | $12,600 | $2,205 | $6,946 | $53,251 |
| Excess Clean Fill Hauling and Disp | 9,000 | CY | $10.00 | $90,000 | $36,000 | $6,300 | $19,845 | $152,145 |
| Liner | | | | | | | | |
| Drainage Layer | 1,400 | CY | $6.50 | $9,100 | $3,640 | $637 | $2,007 | $15,384 |
| Collection Pipes | 750 | LF | $7.50 | $5,625 | $2,250 | $394 | $1,240 | $9,509 |
| 60 mil HDPE Liner | 35,000 | SF | $0.75 | $26,250 | $10,500 | $1,838 | $5,788 | $44,376 |
| 24" Clay Liner | 2,800 | CY | $12.00 | $33,600 | $13,440 | $2,352 | $7,409 | $56,801 |
| Prepared Subbase | 1,400 | CY | $1.50 | $2,100 | $840 | $147 | $463 | $3,550 |
| Geotextile | 3,900 | SY | $1.50 | $5,850 | $2,340 | $410 | $1,290 | $9,889 |
| Multimedia Cap | | | | | | | | |
| 6" Topsoil/Seeding | 750 | CY | $12.00 | $9,000 | $3,600 | $630 | $1,985 | $15,215 |
| 18" Veg Support | 2,250 | CY | $10.50 | $23,625 | $9,450 | $1,654 | $5,209 | $39,938 |
| Geomembrane Drainage | 36,000 | SF | $0.50 | $18,000 | $7,200 | $1,260 | $3,969 | $30,429 |
| 60 mil HDPE Liner | 36,000 | SF | $0.75 | $27,000 | $10,800 | $1,890 | $5,954 | $45,644 |
| 24" Clay Liner | 3,000 | CY | $12.00 | $36,000 | $14,400 | $2,520 | $7,938 | $60,858 |
| Prepared Subgrade | 1,500 | CY | $2.50 | $3,750 | $1,500 | $263 | $827 | $6,339 |
| Compaction | 1,500 | CY | $1.50 | $2,250 | $900 | $158 | $496 | $3,804 |
| Hauling and Placement into Landfill | 11,800 | CY | $5.00 | $59,000 | $23,600 | $4,130 | $13,010 | $99,740 |
| **Portland Concrete Cap** | | | | | | | | |
| Heavily Trucked Areas | 97,000 | SF | | | | | | |
| 10" Concrete Slab | 3,000 | CY | $175.00 | $525,000 | $210,000 | $36,750 | $115,763 | $887,513 |
| Compaction | 3,000 | CY | $1.50 | $4,500 | $1,800 | $315 | $992 | $7,607 |
| **Hydraulic Asphalt Cap** | | | | | | | | |
| Auto Use Areas | 102,000 | SF | | | | | | |
| 4" Hydraulic Asphalt | 11,300 | SY | $8.50 | $96,050 | $38,420 | $6,724 | $21,179 | $162,373 |
| 10" Base Aggregate | 3,100 | CY | $15.00 | $46,500 | $18,600 | $3,255 | $10,253 | $78,608 |
| Compaction | 3,100 | CY | $1.50 | $4,650 | $1,860 | $326 | $1,025 | $7,861 |
| Subtotal | | | | $5,082,350 | $2,032,940 | $355,765 | $1,120,658 | $8,854,754 |
| **Level of Protection Productivity** | | | | | | | | |
| Level D (50%) | | N/A | | | | | | |
| Level C (50%) | 20.00% | LS | | | | | | $885,475 |
| **Health & Safety** | | | | | | | | |
| Initial | 1 | LS | $13,000 | $13,000 | $5,200 | $910 | $2,867 | $21,977 |
| During Construction | 1 | LS | $53,000 | $53,000 | $21,200 | $3,710 | $11,687 | $89,597 |
| **TOTAL** | | | | | | | | $9,852,000 |

**PROJECT:** Woolfolk Chemical Works **BY: JJB/CFB**
**DESCRIPTION:** On-Site Soil Alternatives
**ALTERNATIVE :** ON-6: Hazardous Soil S/S, On-Site Subtitle C Landfill

| DESCRIPTION | QTY | U/M | INSTALLED COSTS UNIT | INSTALLED COSTS AMOUNT | CONTINGENCY 40.00% | MOBILIZATION 5.00% | G+A 15.00% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Delineate Hazardous Soil** | | | | | | | | |
| TCLP | 100 | EA | $1,000 | $100,000 | $40,000 | $7,000 | $22,050 | $169,050 |
| **Excavation Soil and Debris** | | | | | | | | |
| 0-1' Depth | 9,600 | CY | $3.00 | $28,800 | $11,520 | $2,016 | $6,350 | $48,686 |
| 1-4' Depth | 5,300 | CY | $4.00 | $21,200 | $8,480 | $1,484 | $4,675 | $35,839 |
| 4-8' Depth | 2,000 | CY | $5.00 | $10,000 | $4,000 | $700 | $2,205 | $16,905 |
| TOTAL | 16,900 | CY | | | | | | |
| **Tree Removal and Disposal** | | | | | | | | |
| Pecan Orchard Trees | 30 | EA | $600.00 | $18,000 | $7,200 | $1,260 | $3,969 | $30,429 |
| **Soil S/S** | 5,700 | CY | | | | | | |
| | 8,600 | TON | $180.00 | $1,548,000 | $619,200 | $108,360 | $341,334 | $2,616,894 |
| **Construct Subtitle C Landfill** | | | | | | | | |
| Landfill Excavation | 22,800 | CY | $3.50 | $79,800 | $31,920 | $5,586 | $17,596 | $134,902 |
| Excess Clean Fill Hauling and Dispose | 22,800 | CY | $10.00 | $228,000 | $91,200 | $15,960 | $50,274 | $385,434 |
| Liner System | | | | | | | | |
| Geotextile | 6,950 | SY | $1.50 | $10,425 | $4,170 | $730 | $2,299 | $17,623 |
| Sand Drainage Layer (Imported | 2,320 | CY | $6.50 | $15,080 | $6,032 | $1,056 | $3,325 | $25,493 |
| Geotextile | 6,950 | SY | $1.50 | $10,425 | $4,170 | $730 | $2,299 | $17,623 |
| 60 mil - HDPE Liner | 62,500 | SF | $0.75 | $46,875 | $18,750 | $3,281 | $10,336 | $79,242 |
| Geotextile | 6,950 | SY | $1.50 | $10,425 | $4,170 | $730 | $2,299 | $17,623 |
| Sand Drainage Layer (Imported | 2,320 | CY | $6.50 | $15,080 | $6,032 | $1,056 | $3,325 | $25,493 |
| 60 mil - HDPE Liner | 62,500 | SF | $0.75 | $46,875 | $18,750 | $3,281 | $10,336 | $79,242 |
| Clay Layer | 6,950 | CY | $12.00 | $83,400 | $33,360 | $5,838 | $19,390 | $140,988 |
| Prepared Subbase | 1,500 | CY | $1.50 | $2,250 | $900 | $158 | $496 | $3,804 |
| Monitoring Pipes (4" HDPE) | 500 | LF | $7.50 | $3,750 | $1,500 | $263 | $827 | $6,339 |
| Leachate Collection Piping (4" | 500 | LF | $7.50 | $3,750 | $1,500 | $263 | $827 | $6,339 |
| Multimedia Cap Over Landfill | 60,000 | SF | | | | | | |
| 6" Topsoil/Seeding | 1,200 | CY | $12.50 | $15,000 | $6,000 | $1,050 | $3,308 | $25,358 |
| 18" Clean Imported Fill (Veg.) | 3,400 | CY | $10.50 | $35,700 | $14,280 | $2,498 | $7,872 | $60,351 |
| Geomembrane Drainage | 60,000 | SF | $0.50 | $30,000 | $12,000 | $2,100 | $6,615 | $50,715 |
| 60 mil - HDPE Liner | 60,000 | SF | $0.75 | $45,000 | $18,000 | $3,150 | $9,923 | $76,073 |
| 24" Clay Layer | 4,500 | CY | $12.00 | $54,000 | $21,600 | $3,780 | $11,907 | $91,287 |
| 12" Prepared Subgrade | 2,300 | CY | $2.50 | $5,750 | $2,300 | $403 | $1,269 | $9,720 |
| Compaction | 2,300 | CY | $1.50 | $3,450 | $1,380 | $242 | $761 | $5,832 |
| Fence (Security) - Chain Link | 1,400 | LF | $15.00 | $21,000 | $8,400 | $1,470 | $4,631 | $35,501 |
| Placement of Soil in Landfill | 19,300 | CY | $5.00 | $91,500 | $36,600 | $6,405 | $20,176 | $154,681 |
| **Portland Concrete Cap** | | | | | | | | |
| Heavily Trucked Areas | 97,000 | SF | | | | | | |
| 10" Concrete Slab | 3,000 | CY | $175.00 | $525,000 | $210,000 | $36,750 | $115,763 | $887,513 |
| Compaction | 3,000 | CY | $1.50 | $4,500 | $1,800 | $315 | $992 | $7,607 |
| **Hydraulic Asphalt Cap** | | | | | | | | |
| Auto Use Areas | 70,000 | SF | | | | | | |
| 4" Hydraulic Asphalt | 7,800 | SY | $8.50 | $66,300 | $26,520 | $4,641 | $14,619 | $112,080 |
| 10" Base Aggregate | 2,200 | CY | $15.00 | $33,000 | $13,200 | $2,310 | $7,277 | $55,787 |
| Compaction | 2,200 | CY | $1.50 | $3,300 | $1,320 | $231 | $726 | $5,578 |
| **Backfill Excavated Areas** | | | | | | | | |
| Backfill with Imported Fill | 11,500 | CY | $10.00 | $115,000 | $46,000 | $8,050 | $25,359 | $194,409 |
| Subtotal | | | | $3,330,635 | $1,332,254 | $233,144 | $734,405 | $5,630,438 |
| **Level of Protection Productivity** | | | | | | | | |
| Level D (50%) | N/A | | | | | | | |
| Level C (50%) | 20.00% | LS | | | | | | $563,044 |
| **Health & Safety** | | | | | | | | |
| Initial | 1 | LS | $13,000 | $13,000 | $5,200 | $910 | $2,867 | $21,977 |
| During Construction | 1 | LS | $101,000 | $101,000 | $40,400 | $7,070 | $22,271 | $170,741 |
| **TOTAL** | | | | | | | | $6,386,000 |

**PROJECT:** Woolfolk Chemical Works **BY: JJB/CFB**
**DESCRIPTION:** On-Site Soil Alternatives
**`LTERNATIVE :** ON-7: On-Site Subtitle C & D Landfills

| DESCRIPTION | QTY | UNIT | INSTALLED COSTS UNITS | INSTALLED COSTS AMOUNT | CONTINGENCY 40.00% | MOB/BONDING 8.00% | OH & P 18.00% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Delineate Hazardous Soil** | | | | | | | | |
| TCLP | 100 | EA | $1,000 | $100,000 | $40,000 | $7,000 | $22,050 | $169,050 |
| **Excavation Soil and Debris** | | | | | | | | |
| 0-1' Depth | 9,600 | CY | $3.00 | $28,800 | $11,520 | $2,016 | $6,350 | $48,686 |
| 1-4' Depth | 5,300 | CY | $4.00 | $21,200 | $8,480 | $1,484 | $4,675 | $35,839 |
| 4-8' Depth | 2,000 | CY | $5.00 | $10,000 | $4,000 | $700 | $2,205 | $16,905 |
| TOTAL | 16,900 | CY | | | | | | |
| **Tree Removal and Disposal** | | | | | | | | |
| Pecan Orchard Trees | 30 | EA | $600.00 | $18,000 | $7,200 | $1,260 | $3,969 | $30,429 |
| **Construct Subtitle C Landfill** | | | | | | | | |
| Landfill Excavation | 13,600 | CY | $3.50 | $47,600 | $19,040 | $3,332 | $10,496 | $80,468 |
| Excess Clean Fill Hauling and Dispos | 9,800 | CY | $10.00 | $98,000 | $39,200 | $6,860 | $21,609 | $165,669 |
| Liner System | | | | | | | | |
| Geotextile | 4,200 | SY | $1.50 | $6,300 | $2,520 | $441 | $1,389 | $10,650 |
| Sand Drainage Layer (Imported | 1,000 | CY | $6.50 | $6,500 | $2,600 | $455 | $1,433 | $10,988 |
| Geotextile | 4,200 | SY | $1.50 | $6,300 | $2,520 | $441 | $1,389 | $10,650 |
| 60 mil - HDPE Liner | 37,800 | SF | $0.75 | $28,350 | $11,340 | $1,985 | $6,251 | $47,926 |
| Geotextile | 4,200 | SY | $1.50 | $6,300 | $2,520 | $441 | $1,389 | $10,650 |
| Sand Drainage Layer (Imported | 1,400 | CY | $6.50 | $9,100 | $3,640 | $637 | $2,007 | $15,384 |
| 60 mil - HDPE Liner | 37,800 | SF | $0.75 | $28,350 | $11,340 | $1,985 | $6,251 | $47,926 |
| Clay Layer | 4,200 | CY | $12.00 | $50,400 | $20,160 | $3,528 | $11,113 | $85,201 |
| Prepared Subbase | 1,000 | CY | $1.50 | $1,500 | $600 | $105 | $331 | $2,536 |
| Monitoring Pipes (4" HDPE) | 400 | LF | $7.50 | $3,000 | $1,200 | $210 | $662 | $5,072 |
| Leachate Collection Piping (4" | 400 | LF | $7.50 | $3,000 | $1,200 | $210 | $662 | $5,072 |
| Multimedia Cap Over Landfill | 36,100 | SF | | | | | | |
| 6" Topsoil/Seeding | 670 | CY | $12.50 | $8,375 | $3,350 | $586 | $1,847 | $14,158 |
| 18" Clean Imported Fill (Veg.) | 2,000 | CY | $10.50 | $21,000 | $8,400 | $1,470 | $4,631 | $35,501 |
| Geomembrane Drainage | 36,100 | SF | $0.50 | $18,050 | $7,220 | $1,264 | $3,980 | $30,514 |
| 60 mil - HDPE Liner | 36,100 | SF | $0.75 | $27,075 | $10,830 | $1,895 | $5,970 | $45,770 |
| 24" Clay Layer | 2,700 | CY | $12.00 | $32,400 | $12,960 | $2,268 | $7,144 | $54,772 |
| 12" Prepared Subgrade | 1,350 | CY | $2.50 | $3,375 | $1,350 | $236 | $744 | $5,705 |
| Compaction | 1,350 | CY | $1.50 | $2,025 | $810 | $142 | $447 | $3,423 |
| Fence (Security) - Chain Link | 500 | LF | $15.00 | $7,500 | $3,000 | $525 | $1,654 | $12,679 |
| Soil Placement | 5,700 | CY | $5.00 | $28,500 | $11,400 | $1,995 | $6,284 | $48,179 |
| **Construct Subtitle D Landfill** | | | | | | | | |
| Excavation | 13,600 | CY | $3.50 | $47,600 | $19,040 | $3,332 | $10,496 | $80,468 |
| Excess Clean Fill Hauling and Dispos | 13,600 | CY | $10.00 | $136,000 | $54,400 | $9,520 | $29,988 | $229,908 |
| Liner | | | | | | | | |
| Drainage Layer | 1,000 | CY | $6.50 | $6,500 | $2,600 | $455 | $1,433 | $10,988 |
| Collection Pipes | 500 | LF | $7.50 | $3,750 | $1,500 | $263 | $827 | $6,339 |
| 60 mil HDPE Liner | 38,000 | SF | $0.75 | $28,500 | $11,400 | $1,995 | $6,284 | $48,179 |
| 24" Clay Liner | 4,200 | CY | $12.00 | $50,400 | $20,160 | $3,528 | $11,113 | $85,201 |
| Prepared Subbase | 2,100 | CY | $1.50 | $3,150 | $1,260 | $221 | $695 | $5,325 |
| Geotextile | 4,200 | SY | $1.50 | $6,300 | $2,520 | $441 | $1,389 | $10,650 |
| Multimedia Cap | | | | | | | | |
| 6" Topsoil/Seeding | 700 | CY | $12.00 | $8,400 | $3,360 | $588 | $1,852 | $14,200 |
| 18" Veg Support | 2,100 | CY | $10.50 | $22,050 | $8,820 | $1,544 | $4,862 | $37,276 |
| Geomembrane Drainage | 36,100 | SF | $0.50 | $18,050 | $7,220 | $1,264 | $3,980 | $30,514 |
| 60 mil HDPE Liner | 36,100 | SF | $0.75 | $27,075 | $10,830 | $1,895 | $5,970 | $45,770 |
| 24" Clay Liner | 2,800 | CY | $12.00 | $33,600 | $13,440 | $2,352 | $7,409 | $56,801 |
| Prepared Subgrade | 1,400 | CY | $2.50 | $3,500 | $1,400 | $245 | $772 | $5,917 |
| Compaction | 1,400 | CY | $1.50 | $2,100 | $840 | $147 | $463 | $3,550 |
| ..auling and Placement into Landfill | 11,200 | CY | $5.00 | $56,000 | $22,400 | $3,920 | $12,348 | $94,668 |

ESTIMATE SUMMARY

**PROJECT:** Woolfolk Chemical Works **BY: JJB/CFB**
**DESCRIPTION:** On-Site Soil Alternatives
**ALTERNATIVE :** ON-7: On-Site Subtitle C & D Landfills

| DESCRIPTION | QTY | UNIT | INSTALLED COSTS UNITS | INSTALLED COSTS AMOUNT | CONTINGENCY 40.00% | MOBILIZATION 6.00% | O&P 18.00% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Portland Concrete Cap** | | | | | | | | |
| Heavily Trucked Areas | 97,000 | SF | | | | | | |
| 10" Concrete Slab | 3,000 | CY | $175.00 | $525,000 | $210,000 | $36,750 | $115,763 | $887,513 |
| Compaction | 3,000 | CY | $1.50 | $4,500 | $1,800 | $315 | $992 | $7,607 |
| **Hydraulic Asphalt Cap** | | | | | | | | |
| Auto Use Areas | 70,000 | SF | | | | | | |
| 4" Hydraulic Asphalt | 7,800 | SY | $8.50 | $66,300 | $26,520 | $4,641 | $14,619 | $112,080 |
| 10" Base Aggregate | 2,200 | CY | $15.00 | $33,000 | $13,200 | $2,310 | $7,277 | $55,787 |
| Compaction | 2,200 | CY | $1.50 | $3,300 | $1,320 | $231 | $728 | $5,579 |
| **Backfill Excavated Areas** | | | | | | | | |
| Backfill with Imported Fill | 13,000 | CY | $10.00 | $130,000 | $52,000 | $9,100 | $28,665 | $219,765 |
| Subtotal | | | | $1,836,075 | $734,430 | $128,525 | $404,855 | $3,103,885 |
| **Level of Protection Productivity** | | | | | | | | |
| Level D (50%) | | N/A | | | | | | |
| Level C (50%) | 20.00% | LS | | | | | | $310,388 |
| **Health & Safety** | | | | | | | | |
| Initial | 1 | LS | $13,000 | $13,000 | $5,200 | $910 | $2,867 | $21,977 |
| During Construction | 1 | LS | $101,000 | $101,000 | $40,400 | $7,070 | $22,271 | $170,741 |
| TOTAL | | | | | | | | $3,607,000 |

**ESTIMATE SUMMARY**

**PROJECT:** Woolfolk Chemical Works **BY: JJB/CFB**
**DESCRIPTION:** On-Site Soil Alternatives
**ALTERNATIVE :** ON-8: Hazardous Soil S/S, & Landfill Off-Site

| DESCRIPTION | QTY | UNIT | INSTALLED COSTS UNIT | INSTALLED COSTS EXPENSE | CONTINGENCY 40.00% | MOB/MANAGEMENT 8.00% | OH & P 35.00% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Delineate Hazardous Soil** | | | | | | | | |
| TCLP | 100 | EA | $1,000 | $100,000 | $40,000 | $7,000 | $22,050 | $169,050 |
| **Excavation Soil and Debris** | | | | | | | | |
| 0-1' Depth | 9,600 | CY | $3.00 | $28,800 | $11,520 | $2,016 | $6,350 | $48,686 |
| 1-4' Depth | 5,300 | CY | $4.00 | $21,200 | $8,480 | $1,484 | $4,675 | $35,839 |
| 4-8' Depth | 2,000 | CY | $5.00 | $10,000 | $4,000 | $700 | $2,205 | $16,905 |
| TOTAL | 16,900 | CY | | | | | | |
| **Tree Removal and Disposal** | | | | | | | | |
| Pecan Orchard Trees | 30 | EA | $600.00 | $18,000 | $7,200 | $1,260 | $3,969 | $30,429 |
| **Soil S/S** | 5,700 | CY | | | | | | |
| | 8,600 | TON | $180.00 | $1,548,000 | $619,200 | $108,360 | $341,334 | $2,616,894 |
| **Soil Transportation and Disposal** | | | | | | | | |
| S/S Material | | | | | | | | |
| Weight increase (100%) | 17,200 | TON | | | | | | |
| Non-Hazardous Soil and Debris | | | | | | | | |
| Weight | 16,800 | TON | | | | | | |
| Transportation fee | | TON | $55.00 | | | | | |
| Disposal fee | | TON | $90.00 | | | | | |
| Taxes Fee | | TON | $14.00 | | | | | |
| TOTAL | 34,000 | TON | $159.00 | $5,406,000 | $2,162,400 | $378,420 | $1,192,023 | $9,138,843 |
| **Backfill Excavated Areas** | | | | | | | | |
| Backfill with Imported Fill | 13,000 | CY | $10.00 | $130,000 | $52,000 | $9,100 | $28,665 | $219,765 |
| **Portland Concrete Cap** | | | | | | | | |
| Heavily Trucked Areas | 97,000 | SF | | | | | | |
| 10" Concrete Slab | 3,000 | CY | $175.00 | $525,000 | $210,000 | $36,750 | $115,763 | $887,513 |
| Compaction | 3,000 | CY | $1.50 | $4,500 | $1,800 | $315 | $992 | $7,607 |
| **Hydraulic Asphalt Cap** | | | | | | | | |
| Auto Use Areas | 70,000 | SF | | | | | | |
| 4" Hydraulic Asphalt | 7,800 | SY | $8.50 | $66,300 | $26,520 | $4,641 | $14,619 | $112,080 |
| 10" Base Aggregate | 2,200 | CY | $15.00 | $33,000 | $13,200 | $2,310 | $7,277 | $55,787 |
| Compaction | 2,200 | CY | $1.50 | $3,300 | $1,320 | $231 | $728 | $5,579 |
| Subtotal | | | | $7,894,100 | $3,157,640 | $552,587 | $1,740,649 | $13,344,976 |
| **Level of Protection** | | | | | | | | |
| Level D (50%) | | N/A | | | | | | |
| Level C (50%) | 20.00% | LS | | | | | | $1,334,498 |
| **Health & Safety** | | | | | | | | |
| Initial | 1 | LS | $13,000 | $13,000 | $5,200 | $910 | $2,867 | $21,977 |
| During Construction | 1 | LS | $101,000 | $101,000 | $40,400 | $7,070 | $22,271 | $170,741 |
| TOTAL | | | | | | | | $14,872,000 |

**ESTIMATE SUMMARY**
**PROJECT: Woolfolk Chemical Works**
**DESCRIPTION: Existing Cap Alternatives**
**ALTERNATIVE: CP2: Continued Operation and Monitoring**

| DESCRIPTION | QTY | UNIT | INSTALLED COSTS UNIT $ | INSTALLED COSTS AMOUNT | CONTINGENCY 40% | MOB/BOND/INS 5% | OH&P 15% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| Monitoring Well Installation | | | | | | | | |
| Surficial Aquifer | 4 | EA | $5,000 | $20,000 | $8,000 | $400 | $60 | $28,460 |
| Upper Cretaceous Water Table Aquifer | 3 | EA | $12,000 | $36,000 | $14,400 | $720 | $108 | $51,228 |
| Upper Cretaceous Confined Aquifer | 3 | EA | $15,000 | $45,000 | $18,000 | $900 | $135 | $64,035 |
| SUBTOTAL | | | | $101,000 | $40,400 | $2,020 | $303 | $144,000 |
| Health & Safety | | | | | | | | |
| Initial Costs | 1 | LS | $5,000 | $5,000 | $2,000 | $100 | $15 | $7,115 |
| During Construction | 1 | LS | $10,000 | $10,000 | $4,000 | $200 | $30 | $14,230 |
| TOTAL | | | | | | | | $166,000 |

**ESTIMATE SUMMARY**

**PROJECT: Woolfolk Chemical Works**
**DESCRIPTION: Existing Cap Alternatives**
**ALTERNATIVE: CP3: Excavation and On-Site Disposal**

| DESCRIPTION | QTY | UNIT | INSTALLED COSTS UNIT $ | INSTALLED COSTS AMOUNT | CONTINGENCY 40% | MOB/BONDING 6% | OH&P 15% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Predesign Investigation** | 1 | LS | $75,000 | $75,000 | $30,000 | $1,500 | $225 | $106,725 |
| **Excavation** | | | | | | | | |
| 0-3' Depth | 2400 | CY | $3 | $7,200 | $2,880 | $144 | $22 | $10,246 |
| 3-5' Depth | 1500 | CY | $4 | $6,000 | $2,400 | $120 | $18 | $8,538 |
| 5-10' Depth | 4400 | CY | $5 | $22,000 | $8,800 | $440 | $66 | $31,306 |
| 10-15' Depth | 1800 | CY | $8 | $14,400 | $5,760 | $288 | $43 | $20,491 |
| 15-20' Depth | 400 | CY | $10 | $4,000 | $1,600 | $80 | $12 | $5,692 |
| Total | 10500 | CY | | | | | | |
| **Placement Into Landfill** | 8100 | CY | $5 | $40,500 | $16,200 | $810 | $122 | $57,632 |
| **Backfill Excavation** | | | | | | | | |
| Inported Fill | 4700 | CY | $10 | $47,000 | $18,800 | $940 | $141 | $66,881 |
| Topsoil with Seeding | 1000 | CY | $13 | $13,000 | $5,200 | $260 | $39 | $18,499 |
| SUBTOTAL | | | | $229,100 | $91,640 | $4,582 | $687 | $327,000 |
| Health & Safety | | | | | | | | |
| Level C (75%) | 20% | LS | | | | | | $49,050 |
| Initial Costs | 1 | LS | $25,000 | $25,000 | $10,000 | $500 | $75 | $35,575 |
| During Construction | 1 | LS | $100,000 | $100,000 | $40,000 | $2,000 | $300 | $142,300 |
| TOTAL | | | | | | | | $554,000 |

*Note: Cost does not include construction of landfill. This alternative will have to be performed with alternative with onsite landfill.*

ESTIMATE SUMMARY

**PROJECT: Woolfolk Chemical Works**
**DESCRIPTION: Existing Cap Alternatives**
**ALTERNATIVE: CP4: Excavation and Off-Site Disposal**

| DESCRIPTION | QTY | UNIT | INSTALLED COSTS UNIT $ | INSTALLED COSTS AMOUNT | CONTINGENCY 40% | MOB/BOND/INS 5% | OH&P 15% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Predesign Investigation** | 1 | LS | $75,000 | $75,000 | $30,000 | $1,500 | $225 | $106,725 |
| **Excavation** | | | | | | | | |
| 0-3' Depth | 2400 | CY | $3 | $7,200 | $2,880 | $144 | $22 | $10,246 |
| 3-5' Depth | 1500 | CY | $4 | $6,000 | $2,400 | $120 | $18 | $8,538 |
| 5-10' Depth | 4400 | CY | $5 | $22,000 | $8,800 | $440 | $66 | $31,306 |
| 10-15' Depth | 1800 | CY | $8 | $14,400 | $5,760 | $288 | $43 | $20,491 |
| 15-20' Depth | 400 | CY | $10 | $4,000 | $1,600 | $80 | $12 | $5,692 |
| Total | 10500 | CY | | | | | | |
| **Soil S/S** | 8100 | CY | | | | | | |
| Volume Increase (25%) | 10125 | CY | | | | | | |
| Weight Increase (100%) | 20250 | TON | $180 | $3,645,000 | $1,458,000 | $72,900 | $10,935 | $5,186,835 |
| **Soil Disposal** | | | | | | | | |
| Transportation | 20250 | TON | $55 | $1,113,750 | $445,500 | $22,275 | $3,341 | $1,584,866 |
| Disposal and Taxes | 20250 | TON | $104 | $2,106,000 | $842,400 | $42,120 | $6,318 | $2,996,838 |
| **Backfill Excavation** | | | | | | | | |
| Inported Fill | 4700 | CY | $10 | $47,000 | $18,800 | $940 | $141 | $66,881 |
| Topsoil with Seeding | 1000 | CY | $13 | $13,000 | $5,200 | $260 | $39 | $18,499 |
| SUBTOTAL | | | | $7,040,350 | $2,816,140 | $140,807 | $21,121 | $10,037,000 |
| Health & Safety | | | | | | | | |
| Level C (50%) | 20% | LS | | | | | | $1,003,700 |
| Initial Costs | 1 | LS | $25,000 | $25,000 | $10,000 | $500 | $75 | $35,575 |
| During Construction | 1 | LS | $100,000 | $100,000 | $40,000 | $2,000 | $300 | $142,300 |
| TOTAL | | | | | | | | $11,219,000 |

**ESTIMATE SUMMARY**

**PROJECT: Woolfolk Chemical Works**
**DESCRIPTION: Structures**
**ALTERNATIVE: ST2: Decontamination and Disposal of On-Site Buildings**

| DESCRIPTION | QTY | UNIT | INSTALLED COSTS UNIT $ | INSTALLED COSTS AMOUNT | CONTINGENCY 40% | MOB/BOND/INS 5% | OH&P 16% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Building W** | | | | | | | | |
| Debris Sampling | 30 | EA | $500 | $15,000 | $6,000 | $300 | $45 | $21,345 |
| Building Decontamination | 1 | LS | $250,000 | $250,000 | $100,000 | $5,000 | $750 | $355,750 |
| Secure Building | 1 | LS | $25,000 | $25,000 | $10,000 | $500 | $75 | $35,575 |
| SUBTOTAL | | | | $290,000 | $116,000 | $5,800 | $870 | $413,000 |
| Health & Safety | | | | | | | | |
| Level C (75%) | 20% | LS | | | | | | $61,950 |
| Initial Costs | 1 | LS | $10,000 | $10,000 | $4,000 | $200 | $30 | $14,230 |
| During Construction | 1 | LS | $20,000 | $20,000 | $8,000 | $400 | $60 | $28,460 |
| TOTAL | | | | | | | | $518,000 |

## ESTIMATE SUMMARY

PROJECT: Woolfolk Chemical Works
DESCRIPTION: Structures
ALTERNATIVE: ST3: Building Demolition and On-Site Disposal

| DESCRIPTION | QTY | UNIT | INSTALLED COSTS UNIT $ | INSTALLED COSTS AMOUNT | CONTINGENCY 40% | MOB/BOND/INS 5% | OH&P 15% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Building W** | | | | | | | | |
| Debris Sampling | 30 | EA | $500 | $15,000 | $6,000 | $300 | $45 | $21,345 |
| Equipment Removal | | | | | | | | |
| Labor | 500 | HR | $160 | $80,000 | $32,000 | $1,600 | $240 | $113,840 |
| Demolition | | | | | | | | |
| Labor | 1500 | LS | $160 | $240,000 | $96,000 | $4,800 | $720 | $341,520 |
| Hauling On-Facility | 600 | CY | $2 | $1,200 | $480 | $24 | $4 | $1,708 |
| SUBTOTAL | | | | $335,000 | $134,000 | $6,700 | $1,005 | $479,000 |
| Health & Safety | | | | | | | | |
| Level C (50%) | 20% | LS | | | | | | $47,900 |
| Initial Costs | 1 | LS | $10,000 | $10,000 | $4,000 | $200 | $30 | $14,230 |
| During Construction | 1 | LS | $20,000 | $20,000 | $8,000 | $400 | $60 | $28,460 |
| TOTAL | | | | | | | | $570,000 |

*Note: Cost does not include construction of landfill or cap.*

**ESTIMATE SUMMARY**

**PROJECT: Woolfolk Chemical Works**
**DESCRIPTION: Structures**
**ALTERNATIVE: ST4: Building Demolition and Off-Site Disposal**

| DESCRIPTION | QTY | UNIT | INSTALLED COSTS UNIT $ | INSTALLED COSTS AMOUNT | CONTINGENCY 40% | MOB/BOND/INS 5% | OH&P 15% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| **Building W** | | | | | | | | |
| Debris Sampling | 30 | EA | $500 | $15,000 | $6,000 | $300 | $45 | $21,345 |
| Equipment Removal | | | | | | | | |
| Labor | 500 | HR | $160 | $80,000 | $32,000 | $1,600 | $240 | $113,840 |
| Demolition | | | | | | | | |
| Labor | 1500 | LS | $160 | $240,000 | $96,000 | $4,800 | $720 | $341,520 |
| **Hauling and Disposal** | 600 | TON | $50 | $30,000 | $12,000 | $600 | $90 | $42,690 |
| SUBTOTAL | | | | $335,000 | $134,000 | $6,700 | $1,005 | $520,000 |
| Health & Safety | | | | | | | | |
| Level C (50%) | 20% | LS | | | | | | $52,000 |
| Initial Costs | 1 | LS | $10,000 | $10,000 | $4,000 | $200 | $30 | $14,230 |
| During Construction | 1 | LS | $20,000 | $20,000 | $8,000 | $400 | $60 | $28,460 |
| TOTAL | | | | | | | | $615,000 |

**ESTIMATE SUMMARY**

**PROJECT: Woolfolk Chemical Works** **BY: JJB/CFB**

**Alternative SW-2 : Decontamination of Stormwater System**

| DESCRIPTION | QTY | UNIT | MATERIAL COSTS UNITS | MATERIAL COSTS AMOUNT | CONTINGENCY 25.00% | PROFIT/OVERHEAD 5.00% | OH & P 15.00% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| T.V. Camera | 4200 | LF | $2.50 | $10,500 | $2,625 | $656 | $2,067 | $15,848 |
| **Decontamination of Lines** | | | | | | | | |
| 15" line | 660 | LF | $6.00 | $3,960 | $990 | $248 | $780 | $5,977 |
| 24" line | 550 | LF | $8.00 | $4,400 | $1,100 | $275 | $866 | $6,641 |
| 36" line | 490 | LF | $11.00 | $5,390 | $1,348 | $337 | $1,061 | $8,136 |
| 48" line | 2500 | LF | $11.00 | $27,500 | $6,875 | $1,719 | $5,414 | $41,508 |
| **Storage Tank for flushed water (30,000 gallon Tank)** | | | | | | | | |
| ModuTank/EconoTank w/Liner (Per Vender - 30'-6" x 30'-6") | 1 | EA | $5,000.00 | $5,000 | $1,250 | $313 | $984 | $7,547 |
| **Sediment Disposal (Local Non-Haz Landfill)** | | | | | | | | |
| Flushed Sediments | 40 | CY | | | | | | |
| (1.5 Ton/CY) | 60 | TON | $55.00 | $3,300 | $825 | $206 | $650 | $4,981 |
| **Water Disposal** | 42000 | GAL | $1.00 | $42,000 | $10,500 | $2,625 | $8,269 | $63,394 |
| **Sampling & Analysis** | | | | | | | | |
| Lump Sum | 1 | LS | $10,000 | $10,000 | $2,500 | $625 | $1,969 | $15,094 |
| Subtotal | | | | $112,050 | $28,013 | $7,003 | $22,080 | $169,125 |
| **Health & Safety** | 1 | LS | $6,000 | $6,000 | $1,500 | $375 | $1,181 | $9,056 |
| TOTAL | | | | | | | | $178,000 |

**ESTIMATE SUMMARY**

**PROJECT: Woolfolk Chemical Works** **BY: JJB/CFB**

**Alternative SW-3 : Abandon Existing Pipe & Install New Stormwater System**

| DESCRIPTION | QTY | UNIT | RELATED COSTS UNIT$ | RELATED COSTS AMOUNT | CONTINGENCY 25.00% | MOB/DEMOB 5.00% | OH&P 15.00% | TOTAL |
|---|---|---|---|---|---|---|---|---|
| T.V. Camera | 1350 | LF | $2.50 | $3,375 | $844 | $211 | $664 | $5,094 |
| **Grout 48" Pipeline** | | | | | | | | |
| 18" line | 30 | CY | $60.00 | $1,800 | $450 | $113 | $354 | $2,717 |
| 24" line | 70 | CY | $60.00 | $4,200 | $1,050 | $263 | $827 | $6,339 |
| 36" line | 130 | CY | $60.00 | $7,800 | $1,950 | $488 | $1,536 | $11,773 |
| 48" line | 530 | CY | $60.00 | $31,800 | $7,950 | $1,988 | $6,261 | $47,998 |
| **Install New 48" (CMP) Gravity Line** | | | | | | | | |
| 48" CMP | 2800 | LF | $70.00 | $196,000 | $49,000 | $12,250 | $38,588 | $295,838 |
| Trenching @ 4' Deep | 3,733 | CY | $5.00 | $18,667 | $4,667 | $1,167 | $3,675 | $28,175 |
| Backfill | 2,489 | CY | $3.50 | $8,711 | $2,178 | $544 | $1,715 | $13,148 |
| Pipe Base @ 24" | 1,244 | CY | $25.00 | $31,111 | $7,778 | $1,944 | $6,125 | $46,958 |
| Miscellaneous Tie-in's | 1 | LS | $20,000 | $20,000 | $5,000 | $1,250 | $3,938 | $30,188 |
| **Decontamination of Line** | | | | | | | | |
| 48" line | 1700 | LF | $11.00 | $18,700 | $4,675 | $1,169 | $3,682 | $28,225 |
| Storage Tank | 1 | EA | $5,000 | $5,000 | $1,250 | $313 | $984 | $7,547 |
| Sampling and Analysis | 1 | LS | $5,000 | $5,000 | $1,250 | $313 | $984 | $7,547 |
| Sediment Disposal | 50 | TON | $55.00 | $2,750 | $688 | $172 | $541 | $4,151 |
| Water Disposal | 17000 | GAL | $1.00 | $17,000 | $4,250 | $1,063 | $3,347 | $25,659 |
| Subtotal | | | | $371,914 | $92,978 | $23,245 | $73,221 | $561,358 |
| **Health & Safety** | | | | | | | | |
| Initial | 1 | LS | $10,000 | $10,000 | $2,500 | $625 | $1,969 | $15,094 |
| During Construction | 1 | LS | $10,000 | $10,000 | $2,500 | $625 | $1,969 | $15,094 |
| TOTAL | | | | | | | | $592,000 |

## Appendix F

# Summary of Evaluation of Existing Cap Performance (Drawings Not Included)

# WOOLFOLK CHEMICAL WORKS SITE

# SUMMARY AND EVALUATION

# OF INFORMATION ON THE

# EXISTING CAPPED AREA (AREA 1)

Prepared by

Clean Sites Inc.
Alexandria, Virginia

October 1993

## I. Introduction

This report summarizes information on the existing capped area at the Woolfolk Chemical Works Site in Fort Valley, Georgia. EPA requested an evaluation of the area in a letter dated September 4, 1993. The area was the location of the 1986 and 1987 removal of buildings and structures and heavily contaminated soils beneath the former production area for arsenical pesticides. The excavated area was filled predominantly with a lime sulfur waste material and an engineered cap was constructed over the one acre area.

The remediated area is protective of human health and the environment because all exposure pathways have been eliminated. The material removed from the capped area (and disposed of off site) was the major source of arsenic contamination at the site.

The cap construction was part of the remediation conducted in 1986 and 1987 as a voluntary action. Though the EPA Superfund program was not involved with the site at the time, Georgia Environmental Protection Division had significant involvement that included reviewing and providing comments on plans and design documents, inspections of the remedial activities, and executing a Consent Decree to cover discharge of wastewater from remediation activities to the POTW. DRAWING 1 contains the Site Cleanup Layout Plan from September 1986 as provided to Georgia Environmental Protection Division at the time. The existing capped area is designated as "Area 1" on this DRAWING. It is the location of the former arsenical production operation.

During the current Remedial Investigation/Feasibility Study (RI/FS) scoping task, information concerning the existing capped area was reviewed. This information was available to EPA at and prior to the time of project scoping. All available information indicated that the engineered cap was designed and constructed using good engineering practices. Subsequent site inspections indicate that the engineered cap is in excellent condition with a good vegetative cover and has no evidence of differential settling or subsidence.

For the remedial investigation, a sampling program was proposed and approved by EPA to characterize the materials beneath the engineered cap using Superfund analytical protocols. Angle borings were used to sample materials beneath the engineered cap without disturbing it. The angle boring results confirmed past information concerning the area. Each of the approved remedial alternatives presented in the Feasibility Study includes provisions to maintain the existing capped area and to extract and treat affected groundwater.

This report includes the following sections:


I. Introduction
II. List of Relevant Documents
III. Description of the Engineered Cap
IV. Description of the Excavation
V. Description of the Fill
VI. Groundwater
VII. Conclusions
VIII. Appendices and Drawings

## II. List of Relevant Documents

Some of the more significant documents that contain information on the capped area include:

- "Reports and Investigations Relative To Woolfolk Chemical Works, Inc., Fort Valley, Georgia" by Applied Engineering & Science including:
  - "Cleanup Report For Former Woolfolk Chemical Works Plant Site" dated August 1987
  - "Remedial Action Work Plan for Woolfolk Chemical Works" dated September 1986
- Phase I Site Characterization Report dated October 28, 1991 including:
  - Chapter 2 "Study Area Investigations" (description of the angle borings)
  - Chapter 4 "Nature and Extent of Contamination (description of the angle boring results)
- Final Remedial Investigation including:
  - Location of monitoring wells
  - Groundwater flow patterns
  - Groundwater sampling results
  - Historical hydrographs and water quality data

This summary report has taken portions of the more relevant sections from the above reports and provided them as the following DRAWINGS and APPENDIX:

- DRAWING 1 "SITE CLEANUP LAYOUT PLAN", AES ENGINEERING, DATED SEPTEMBER, 1986
- DRAWING 2 "CAP PLAN AND DETAIL", AES ENGINEERING, DATED JULY 1987
- DRAWING 3 "AREA I EXCAVATION PLAN", AES ENGINEERING, DATED MARCH, 1986
- APPENDIX 2 "ANGLE BORING ANALYTICAL RESULTS", CH2M Hill, DATED OCTOBER 1991 (from the Phase I Site Characterization Report)

In addition, the following DRAWING AND APPENDIX have been prepared based on existing information:

- APPENDIX 1 "HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE (HELP) MODEL - WOOLFOLK CHEMICAL WORKS SITE - EXISTING capped area", D.C. AMMON, DATED OCTOBER, 1993
- DRAWING 4 "SECTION NORTH/SOUTH & SECTION WEST/EAST", CH2M HILL, DATED OCTOBER, 1993 (prepared from AES Engineering's Drawings)

## III. Description of the Engineered Cap

***Leachate generation is minimal.***

***The cap is functionally equivalent to a RCRA cap.***

DRAWING 2 contains the engineered cap plan and detail sheet. The engineered cap is approximately rectangular in shape, 150 feet wide by 290 feet long at the base (about 1 acre). The engineered cap components consist of, from top to bottom, grass, 24-inches of topsoil, a filtering geotextile, 12-inches of granular drainage material, a 30-mil HDPE flexible membrane liner (FML), 24-inches of recompacted clay, and geotextile fabric on the subbase to the recompacted clay. The finished grade and drainage layer have a minimum slope of 3 percent.

The engineered cap section, slope, and component thicknesses would meet the guidance presented in the US EPA technical guidance document, "Final Covers on Harzardous Waste Landfills and Surface Impoundments", July 1989. The material used as fill under the engineered cap was determined to be a nonhazardous waste based on analytical testing; therefore, RCRA was not applicable. Though RCRA was not applicable, the RCRA "requirements" are reasonable benchmarks to evaluate the engineered cap.

The flexible membrane liner (FML) is the most significant feature in the engineered cap. Properly installed FMLs should prevent the infiltration or percolation of rainfall through the fill material and through the subsoils beneath the fill. The FML is a 30-mil high density polyethylene (HDPE) geomembrane. This exceeds the minimum recommended RCRA thickness of 20-mil. All (100 %) FML seams were tested with a vacuum box during construction. All seam leaks were repaired and retested. A full-time geotechnical engineer from ATEC (who was independent of the liner installation company) monitored the installation of the FML layer.

The 24-inch recompacted clay layer was placed in 8-inch lifts. Five permeability tests were conducted on field-compacted clay layer samples. The permeabilities ranged from 2.5e-7 to 6.0e-7 cm/sec when compacted to between 95 to 100 percent of the maximum dry density as determined by ASTM D698. This is slightly higher than the permeability recommended for a RCRA hazardous waste cap (i.e., 1e-7). Thirteen field density tests were taken with compacted soil densities from 95 to 100 percent. The full-time geotechnical engineer from ATEC also monitored the installation of the clay layer.

One remolded permeability test was conducted on the drainage layer material and was reported to be 2.6e-3 cm/sec when compacted to 95 percent of the maximum dry density as determined by ASTM D698. This is slightly less permeable than the permeability recommended for a RCRA

hazardous waste cap (i.e., 1e-2 cm/sec). The intent of this layer is to minimize the amount and residence time of water coming into contact with the low-permeability layer.

The hydrologic effectiveness of the engineered cap was evaluated using the EPA-USCOE Hydrologic Evaluation of Landfill Performance (HELP) Model using the less conservative measured permeabilities (hydraulic conductivities) for the drainage layer and recompacted clay layer. This evaluation is provided in APPENDIX 1.

Two liner leakage fractions were used: 0.01% and 1.0%. The "0.01%" liner leakage fraction is the HELP Model default value for a "good" liner with minimal seam leakage. The "1%" leakage fraction is the highest liner leakage fraction recommended by the HELP Model documentation and would represent the "worst-case" leakage through the FML. Since every seam was tested and there is no evidence of differential settling on the capped area, the "0.01% liner leakage fraction would be the more realistic assumption.

Climatological data were available from Macon, Georgia from the HELP Model's synthetic climatological data base. Twenty years of these statistically valid data were used in the HELP Model evaluations.

For the "0.01%" liner leakage fraction case, only 0.001 inches per year of water percolates through the engineered cap. This represents only 4 cubic feet of water per year through the 1-acre capped area. Using the "1%" liner leakage fraction case, 0.095 inches per year of water percolates through the engineered cap. This represents 358 cubic feet of water per year through the 1-acre capped area. The typical "natural" infiltration rates for Central Georgia range from 5 to 10 inches per year.

These results indicate that the hydrologic effectiveness of the engineered cap is expected to be very good even using the "worst-case" FML liner leakage assumption. The potential to generate significant quantity of leachate from the fill material or the unsaturated soils below the fill material is minimal. Overall, the engineered cap is functionally equivalent to a RCRA-type engineered cap.

## IV. Description of the Excavation

*The major source was removed.*

After the demolition of the structures on Area 1, 1,500 cubic yards of heavily contaminated soils were removed from Area 1. Area 1 includes the former unloading area. The criteria for excavation were to remove arsenic and lead contaminated soils with concentrations greater than 10,000 mg/kg. Several feet of soil were typically excavated following these criteria, except in the unloading area where a trench was excavated.

In the unloading area a 20-feet deep exploratory trench was excavated due to the presence of arsenic and lead deeper than originally anticipated. The exploratory trench found that a sand zone in one location was within 10 feet of the original ground surface. The on-site geologist identified the sand layer as the upper portion of the surficial zone that contains the perched groundwater. Because the undisturbed clay layer appeared to be otherwise continuous, the sand layer was the likely pathway for downward migration in this area. Clay from an offsite source was brought in and recompacted to create a barrier in this trench bottom.

DRAWING 3 contains the post-excavation contours. DRAWING 4 shows two cross-sections containing post-excavation contours. The location of the trench area is shown on these drawings.

During the Phase I Remedial Investigation, angle borings were taken around the capped area. Six samples were taken below the depth of excavation. These sample designations have "BI" in the code for "below interface" and one sample has "NS" which is a native sand at about 28 feet in depth. APPENDIX 2 contains the analytical results (taken from the Phase I Site Characterization Report). A handwritten "*" has been placed on the analytical results that were taken below the depth of excavation. Two samples had arsenic at 850 mg/kg and 101 mg/kg and four samples had arsenic less than 20 mg/kg.

No organic pesticides were detected in any of these samples. Three other organic compounds were detected, only one in each of three samples. These results indicate that there is very limited contamination below the depth of excavation.

## V. Description of the Fill

***The fill material is predominantly lime sulfur material and is not a "hot spot".***

The fill in the excavated area consisted of 3,000 cubic yards of non-hazardous lime sulfur material and 500 cubic yards of masonry rubble from the building demolition. The lime sulfur material was analyzed at the time to be a non-hazardous waste based on the applicable leaching test (i.e., EP Tox). A crude volume balance indicates that about 1,500 cubic yards of soils were excavated and removed while 3,500 cubic yards of material was used as fill. It was also reported that pozzalime was added to the fill to create a stable subgrade for the engineered cap.

During the Phase I Remedial Investigation, angle borings were implemented around the capped area. Except for the six samples taken below the depth of excavation described in Section IV, the angle borings contain information on the fill or the fill/native subsurface soils interface. The shallowest angle borings may have sampled adjacent soils instead of fill material because they are at the perimeter of the capped area. APPENDIX 2 contains the analytical results (taken from the Phase I Site Characterization Report).

Three of the angle borings in the fill clearly encountered lime-sulfur material based on the visual description. A handwritten "LS" has been placed on the analytical results that were taken from samples that were identified as lime sulfur material. These three samples had arsenic between 235 mg/kg and 1,000 mg/kg.

The other fill samples also had arsenic concentrations ranging from below detection to 801 mg/kg. Several of the angle borings (including one of the lime sulfur samples) contain several of the pesticides that were frequently found in other on-site soils. Pentachlorophenol was detected in all three lime sulfur angle boring samples at low levels (between 0.16 and 0.5 mg/kg). Several other organic compounds were also detected with no discernable pattern nor with any particularly high levels.

The overall conclusion is that the fill material under the existing engineered cap has contamination levels similar to other on-site soils though it does not appear to be a "hot spot". This is not surprising since most of the fill material was taken from the old lime sulfur waste pile.

## VI. Groundwater

***Arsenic levels in the surficial groundwater have dropped since the installation of the cap.***

***Monitoring wells are well-placed to determine future performance of the engineered cap.***

The surficial perched groundwater is below the existing capped area. The direction of groundwater flow is in the southeasterly direction. Four monitoring wells are upgradient (MW-2, MW-2C, MW-4C and MW-4B). Three wells are downgradient (MW-12, MW-13, and MW-14). MW-12 is the closest downgradient and MW-2 is closest upgradient monitoring well. In the next groundwater zone, the Upper Cretaceous water table aquifer, there are also monitoring wells encircling the existing capped area.

Water level elevations in MW-12 have not exceeded 478 feet (MSL) with data from 1985 through 1992. Water level elevations in MW-2 have not exceeded 486 feet (MSL) with data from 1984 to 1992 (see Volume 5, Appendix E of the Final Remedial Investigation Report). The maximum depth of the excavation was 494.51 ft (MSL) in the bottom of the trench area. Most of the excavation was greater than 510 feet (MSL). There are typically 20 or more feet of unsaturated soils between the fill and the surficial perched water table.

Historically, MW-12 has had the highest arsenic concentrations at the site. MW-12 had the highest arsenic concentrations prior to construction of the engineered cap. November 11, 1984 arsenic level was 25 mg/l. January 24, 1986 arsenic level was 22.3 mg/l. The most recent arsenic level was 5.9 mg/l in the Phase II RI (1992). MW-2 had its highest arsenic concentration in 1985 prior to the engineered cap construction at 0.046 mg/l. Most recently it had 0.0325 mg/l of arsenic. Although these data are favorable with respect to the engineered cap performance, long-term monitoring will be needed to evaluate any groundwater quality trends.

According to the groundwater elevation data and the placement of the existing wells, wells are in the appropriate locations to determine if leachate from the area under the existing engineered cap is being generated over time. In addition, every alternative in the Final Feasibility Study (except the no-action alternative) contains provisions for extraction and treatment of the surficial perched groundwater.

## VII. Conclusions

All available information indicates that the engineered cap was designed and constructed using good engineering practices. Site inspections indicate that it is in excellent condition with a good vegetative cover and no evidence of differential settling or subsidence. The engineered cap is functionally equivalent to a RCRA-style cap and will prevent leachate generation. The fill material under engineered cap is substantially above the surficial water table; thus, leaching from direct contact with groundwater is unlikely. Groundwater monitoring wells in the surficial perched groundwater and in the Upper Cretaceous water table aquifer are located in upgradient and downgradient locations to monitor any changes in groundwater quality over time.

Only one of six angle boring samples of native subsurface soils beneath the fill had arsenic concentrations greater than 101 mg/kg. 100 mg/kg is the groundwater protection action level for arsenic with no engineering controls. Two engineering controls are applicable to these native subsurface soils: (1) the existing engineered cap controls percolation through the native subsurface soils and (2) the surficial perched groundwater will be extracted and treated as part of the groundwater remedy for the site.

All information on the existing capped area indicates that this area been effectively remediated and is protective of human health and the environment. Results from the RI/FS do not indicate that the existing capped area is a current source of contamination to the groundwater. Each of the approved remedial alternatives presented in the Feasibility Study includes provisions to maintain the existing capped area and to extract and treat affected groundwater.

# APPENDIX 1

"HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE
(HELP) MODEL
WOOLFOLK CHEMICAL WORKS SITE - EXISTING CAP"
D.C. AMMON
DATED OCTOBER 1993

**********
**********

EPA-USCOE Hydrologic Evaluation of Landfill Performance (HELP) Model
WOOLFOLK CHEMICAL WORKS SITE-EXISTING CAPPED AREA
FORT VALLEY, GA USING WEATHER DATA FROM MACON
ANALYSIS CONDUCTED BY D.C.AMMON OCT. 1993
"0.01 PERCENT" FML FAILURE
"BEST CASE"

**********
**********

FAIR GRASS

LAYER 1
---

VERTICAL PERCOLATION LAYER

| | | |
|---|---|---|
| THICKNESS | = | 24.00 INCHES |
| POROSITY | = | 0.3980 VOL/VOL |
| FIELD CAPACITY | = | 0.2443 VOL/VOL |
| WILTING POINT | = | 0.1361 VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.2443 VOL/VOL |
| SATURATED HYDRAULIC CONDUCTIVITY | = | 0.000360000005 CM/SEC |

LAYER 2
---

LATERAL DRAINAGE LAYER

| | | |
|---|---|---|
| THICKNESS | = | 12.00 INCHES |
| POROSITY | = | 0.3509 VOL/VOL |
| FIELD CAPACITY | = | 0.0705 VOL/VOL |
| WILTING POINT | = | 0.0326 VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.0705 VOL/VOL |
| SATURATED HYDRAULIC CONDUCTIVITY | = | 0.002600000007 CM/SEC |
| SLOPE | = | 3.00 PERCENT |
| DRAINAGE LENGTH | = | 100.0 FEET |

## LAYER 3

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

| | | |
|---|---|---|
| THICKNESS | = | 24.00 INCHES |
| POROSITY | = | 0.4219 VOL/VOL |
| FIELD CAPACITY | = | 0.3412 VOL/VOL |
| WILTING POINT | = | 0.2505 VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.4219 VOL/VOL |
| SATURATED HYDRAULIC CONDUCTIVITY | = | 0.000000600000 CM/SEC |
| LINER LEAKAGE FRACTION | = | 0.00010000 |

## GENERAL SIMULATION DATA

| | | |
|---|---|---|
| SCS RUNOFF CURVE NUMBER | = | 85.56 |
| TOTAL AREA OF COVER | = | 45000. SQ FT |
| EVAPORATIVE ZONE DEPTH | = | 22.00 INCHES |
| UPPER LIMIT VEG. STORAGE | = | 8.7560 INCHES |
| INITIAL VEG. STORAGE | = | 5.9488 INCHES |
| INITIAL SNOW WATER CONTENT | = | 0.0000 INCHES |
| INITIAL TOTAL WATER STORAGE IN SOIL AND WASTE LAYERS | = | 16.8348 INCHES |

SOIL WATER CONTENT INITIALIZED BY PROGRAM.

## CLIMATOLOGICAL DATA

SYNTHETIC RAINFALL WITH SYNTHETIC DAILY TEMPERATURES AND
SOLAR RADIATION FOR MACON GEORGIA

| | | |
|---|---|---|
| MAXIMUM LEAF AREA INDEX | = | 2.00 |
| START OF GROWING SEASON (JULIAN DATE) | = | 60 |
| END OF GROWING SEASON (JULIAN DATE) | = | 316 |

NORMAL MEAN MONTHLY TEMPERATURES, DEGREES FAHRENHEIT

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 46.60 | 49.20 | 56.50 | 65.30 | 72.70 | 78.90 |
| 81.40 | 81.00 | 76.00 | 65.20 | 55.30 | 48.70 |

**********

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 20

| | (INCHES) | | (CU. FT.) | PERCENT |
|---|---|---|---|---|
| PRECIPITATION | 44.35 | ( 8.164) | 166318. | 100.00 |
| RUNOFF | 3.144 | ( 3.016) | 11791. | 7.09 |
| EVAPOTRANSPIRATION | 36.152 | ( 4.118) | 135570. | 81.51 |
| LATERAL DRAINAGE FROM LAYER 2 | 5.1112 | ( 2.6515) | 19167. | 11.52 |
| PERCOLATION FROM LAYER 3 | 0.0010 | ( 0.0001) | 4. | 0.00 |
| CHANGE IN WATER STORAGE | -0.057 | ( 2.770) | -214. | -0.13 |

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******************************************************************************
******************************************************************************

  EPA-USCOE Hydrologic Evaluation of Landfill Performance (HELP) Model
          WOOLFOLK CHEMICAL WORKS SITE-EXISTING CAPPED AREA
            FORT VALLEY, GA USING WEATHER DATA FROM MACON
            ANALYSIS CONDUCTED BY D.C.AMMON OCT. 1993
                  "1 PERCENT" FML FAILURE

******************************************************************************
******************************************************************************


                          FAIR GRASS

                           LAYER  1
                           --------

                     VERTICAL PERCOLATION LAYER
   THICKNESS                          =     24.00 INCHES
   POROSITY                           =      0.3980 VOL/VOL
   FIELD CAPACITY                     =      0.2443 VOL/VOL
   WILTING POINT                      =      0.1361 VOL/VOL
   INITIAL SOIL WATER CONTENT         =      0.2443 VOL/VOL
   SATURATED HYDRAULIC CONDUCTIVITY   =      0.000360000005 CM/SEC

                           LAYER  2
                           --------

                       LATERAL DRAINAGE LAYER
   THICKNESS                          =     12.00 INCHES
   POROSITY                           =      0.3509 VOL/VOL
   FIELD CAPACITY                     =      0.0705 VOL/VOL
   WILTING POINT                      =      0.0326 VOL/VOL
   INITIAL SOIL WATER CONTENT         =      0.0705 VOL/VOL
   SATURATED HYDRAULIC CONDUCTIVITY   =      0.002600000007 CM/SEC
   SLOPE                              =      3.00 PERCENT
   DRAINAGE LENGTH                    =    100.0 FEET
```

## LAYER 3

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

| | | |
|---|---|---|
| THICKNESS | = | 24.00 INCHES |
| POROSITY | = | 0.4219 VOL/VOL |
| FIELD CAPACITY | = | 0.3412 VOL/VOL |
| WILTING POINT | = | 0.2505 VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.4219 VOL/VOL |
| SATURATED HYDRAULIC CONDUCTIVITY | = | 0.000000600000 CM/SEC |
| LINER LEAKAGE FRACTION | = | 0.01000000 |

## GENERAL SIMULATION DATA

| | | |
|---|---|---|
| SCS RUNOFF CURVE NUMBER | = | 85.56 |
| TOTAL AREA OF COVER | = | 45000. SQ FT |
| EVAPORATIVE ZONE DEPTH | = | 22.00 INCHES |
| UPPER LIMIT VEG. STORAGE | = | 8.7560 INCHES |
| INITIAL VEG. STORAGE | = | 5.9488 INCHES |
| INITIAL SNOW WATER CONTENT | = | 0.0000 INCHES |
| INITIAL TOTAL WATER STORAGE IN SOIL AND WASTE LAYERS | = | 16.8348 INCHES |

SOIL WATER CONTENT INITIALIZED BY PROGRAM.

## CLIMATOLOGICAL DATA

SYNTHETIC RAINFALL WITH SYNTHETIC DAILY TEMPERATURES AND
SOLAR RADIATION FOR MACON GEORGIA

| | | |
|---|---|---|
| MAXIMUM LEAF AREA INDEX | = | 2.00 |
| START OF GROWING SEASON (JULIAN DATE) | = | 60 |
| END OF GROWING SEASON (JULIAN DATE) | = | 316 |

NORMAL MEAN MONTHLY TEMPERATURES, DEGREES FAHRENHEIT

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 46.60 | 49.20 | 56.50 | 65.30 | 72.70 | 78.90 |
| 81.40 | 81.00 | 76.00 | 65.20 | 55.30 | 48.70 |

**********

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 20

| | (INCHES) | | (CU. FT.) | PERCENT |
|---|---|---|---|---|
| PRECIPITATION | 44.35 | ( 8.164) | 166318. | 100.00 |
| RUNOFF | 3.134 | ( 2.999) | 11754. | 7.07 |
| EVAPOTRANSPIRATION | 36.151 | ( 4.114) | 135566. | 81.51 |
| LATERAL DRAINAGE FROM LAYER 2 | 5.0320 | ( 2.6602) | 18870. | 11.35 |
| PERCOLATION FROM LAYER 3 | 0.0954 | ( 0.0123) | 358. | 0.22 |
| CHANGE IN WATER STORAGE | -0.061 | ( 2.773) | -229. | -0.14 |

**********

# APPENDIX 2

"ANGLE BORING ANALYTICAL RESULTS"
CH2M Hill
DATED OCTOBER 1991
(from the Phase I Site Characterization Report)

Table 2-1
Angle Borings in Area 1
WCW Remedial Investigation
Phase I

| Sample ID | Sample Material | Angle | Vertical | Feet of Auger | Time Sampled |
|---|---|---|---|---|---|
| WRIAB1BF | Orange sandy clay | -- | 1 | -- | 10:50 |
| WRIAB1IF | Orange sandy clay | 45° | 5 | 9 | 11:10 |
| WRIAB15BI | Gray brown/reddish clay | 45° | 10 | 14 | 11:40 |
| WRIAB110BI | Dark brown clay | 45° | 15 | 20 | 12:40 |
| WRIAB120BI | Dark gray brown clay | 45° | 28 | 40 | 1:20 |
| WRIAB2BF | Red clay | 47° | 1 | 0 | 5:00 |
| WRIAB2IF | Orange sand | 46° | 28 | 40 | 10:20 |
| WRIAB28BI | Orange clay | 48° | 36 | 50 | 12:05 |
| WRIAB3BFI | Orange sandy clay | 45° | 1 | 0 | 4:00 |
| WRIAB3BFII | Brownish green lime sulfur | 45° | 7 | 20 | 4:40 |
| WRIAB3IF | Lime sulfur/red clay | 45° | 18 | 25 | 5:20 |
| WRIAB35BI | Red clay | 45° | 21 | 30 | 5:40 |
| WRIAB3510C | Gray clayey sand | 45° | 28 | 40 | 6:15 |
| WRIVBC5 | Red clay | -- | 5 | -- | 10:45 |
| WRIVBC10 | Red clay | -- | 10 | -- | 11:25 |
| WRIVBC20 | Orange sand | -- | 20 | -- | 11:50 |
| WRIAB4BF | Red clay, trace lime sulfur | 46° | 7 | 10 | 9:45 |
| WRIAB45BI | Red sandy clay (EPA split) | 45° | 18 | 25 | 11:30 |
| WRIAB49BI | Orange sandy clay | 45° | 21 | 31 | 1:30 |
| WRIAB414B | Orange to white sand | 45° | 28 | 40 | 2:00 |
| WRIAB5BF | Red clay | 45° | 7 | 10 | 7:40 |
| WRIAB5DBF | Red sandy clay | 45° | 18 | 25 | 10:10 |
| WRIAB5NS | Yellow sands | 45° | 28 | 40 | 11:20 |

TABLE 4-30
ANGLE BORING SOIL SAMPLES
INORGANIC CONSTITUENTS DETECTED

| SAMPLE ID CONSTITUENT | DETECTION LIMIT | AB1 WRIAB1-BF | AB1 WRIAB1-IF | AB1 * WRIAB110BI | AB1 * WRIAB15BI | AB2 WRIAB210F | AB2 * WRIAB28BI | AB2 WRIAB2IF | AB3 WRIAB3510 |
|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | 40 | 8900 | 7860 | 10600 | 10200 | 8140 | 1470 | 66880 | 3250 |
| ANTIMONY | 12 | -- | -- | -- | -- | -- | -- | -- | -- |
| ARSENIC | 2 | 9.2NJ | 7.9NJ | 9.2NJ | 8NJ | -- | -- | 4NJ | 213J |
| BARIUM | 40 | -- | 74.5 | -- | -- | -- | -- | -- | -- |
| BERYLLIUM | 1 | -- | 1.2 | -- | -- | -- | -- | -- | -- |
| CADMIUM | 1 | -- | -- | -- | -- | -- | -- | -- | -- |
| CALCIUM | 1000 | -- | 12400 | 5760 | -- | 1840 | -- | -- | 4870 |
| CHROMIUM | 2 | 18.6J | -- | 59J | 56.4J | 46.7J | 10.7J | 14J | 12.5J |
| COBALT | 10 | -- | -- | -- | -- | -- | -- | -- | 1.1 |
| COPPER | 5 | -- | -- | -- | -- | -- | -- | -- | -- |
| CYANIDE | 2 | 0.57J | -- | -- | -- | -- | -- | -- | -- |
| IRON | 20 | 12700 | 11300 | 40600 | 37100 | 35100 | 6060 | 13700 | 7750 |
| LEAD | 0.6 | 8.6*J | 39.8*J | 5.2S*J | 5.7S*J | 4.1S*J | 3.2*J | 5.5*J | 5.6S*J |
| MAGNESIUM | 1000 | -- | 3470 | -- | -- | -- | -- | -- | -- |
| MANGANESE | 3 | 36.8 | 534 | 109 | 133 | 101 | 25.6 | 73.3 | 17.2 |
| MERCURY | 0.2 | 0.1 | -- | -- | -- | -- | -- | -- | -- |
| NICKEL | 8 | -- | -- | -- | -- | -- | -- | -- | -- |
| POTASSIUM | 1000 | 283 | -- | -- | -- | -- | -- | -- | 286I |
| SELENIUM | 1 | 0.68 | -- | -- | -- | -- | -- | -- | -- |
| SILVER | 2 | 1.1 | -- | -- | -- | -- | -- | -- | -- |
| SODIUM | 1000 | -- | 9300J | -- | -- | -- | -- | -- | -- |
| THALLIUM | 2 | -- | 0.71 | -- | -- | -- | -- | -- | 0.69 |
| VANADIUM | 10 | 35.4J | -- | 127J | 102J | 109J | 19.1J | 42.4J | 22.8 |
| ZINC | 4 | 9.9 | 61.9 | 10.9 | 7.7 | 11.1 | 6.6 | -- | 9.3 |

-- Compound analyzed and reported in database as:
detected in blank (B) or
invalid/rejected (R) or
below detection limit (U)

* below the depth of excavation
LS = Lime Sulfur Material

DRAFT

TABLE 30
ANGLE RING SOIL SAMPLES
INORGANIC CONSTITUENTS DETECTED

| SAMPLE ID CONSTITUENT | DETECTION LIMIT | AB3 WRIAB35BI * | AB3 WRIAB3BF1 | AB3 WRIAB3BF2 LS | AB3 WRIAB3IF LS | AB4 WRIAB414B | AB4 WRIAB45B | AB4 WRIAB49BI * | AB4 WRIAB4BF LS |
|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | 40 | 12000 | 14400 | 23300 | 7620 | 795 | 6280 | 2900 | 30300 |
| ANTIMONY | 12 | -- | -- | -- | -- | -- | -- | -- | -- |
| ARSENIC | 2 | 850 | 801 | 855 | 235 | 13.4NJ | 128 | 101NJ | 1000 |
| BARIUM | 40 | -- | -- | 95.9 | -- | -- | -- | -- | -- |
| BERYLLIUM | 1 | -- | -- | -- | -- | -- | -- | -- | -- |
| CADMIUM | 1 | -- | 1.2J | 1.2J | -- | -- | 1.3J | -- | 2.3J |
| CALCIUM | 1000 | 9800 | 4740 | 8560 | 14300 | -- | -- | -- | 6000 |
| CHROMIUM | 2 | 399.8N*J | 23.5N*J | 32N*J | 22.6N+J | 12.8N*J | 50.6N*J | 8.4N*J | 44.5N*J |
| COBALT | 10 | -- | -- | -- | -- | -- | -- | -- | -- |
| COPPER | 5 | -- | 11.4 | 9.4 | -- | -- | 21.1 | -- | 78 |
| CYANIDE | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| IRON | 20 | 23200* | 15900* | 24800* | 22000* | 4180* | 26800* | 6090* | 32000* |
| LEAD | 0.6 | 20.7S | 120 | 49SJ | 10.5S | 2 | 14S | 2.5 | 98.7 |
| MAGNESIUM | 1000 | -- | -- | -- | -- | -- | -- | -- | -- |
| MANGANESE | 3 | 43.7 | 717.7 | 58.4 | 30.2 | 9.1 | 143 | 19.1 | 154 |
| MERCURY | 0.2 | -- | -- | -- | -- | -- | -- | -- | 0.36 |
| NICKEL | 8 | -- | -- | 13.8 | -- | -- | -- | -- | 13.4 |
| POTASSIUM | 1000 | -- | -- | -- | -- | -- | -- | -- | -- |
| SELENIUM | 1 | -- | -- | -- | -- | -- | -- | -- | -- |
| SILVER | 2 | -- | -- | -- | -- | -- | -- | -- | -- |
| SODIUM | 1000 | -- | -- | -- | -- | -- | -- | -- | -- |
| THALLIUM | 2 | 0.44 | -- | -- | -- | -- | -- | -- | -- |
| VANADIUM | 10 | 74.5 | 54 | 77.3 | 62.4 | 13.2 | 83.2 | 17.9 | 95.8 |
| ZINC | 4 | 17.6 | 148J | 47.4J | 15.8J | 156J | 3510J | 394J | 1570J |

-- Compound analyzed and reported in database as:
detected in blank (B) or
invalid/rejected (R) or
below detection limit (U)

DRAFT

TABI ·30
ANGL ORING SOIL SAMPLES
INORGANIC CONSTITUENTS DETECTED

| SAMPLE ID CONSTITUENT | DETECTION LIMIT | AB5 WRIAB5BF | AB5 WRIAB5DBF | AB5 WRIAB5NS | VB WRIVBC10 | VB WRIVBC20 | VB WRIVBC5 |
|---|---|---|---|---|---|---|---|
| ALUMINUM | 40 | 20900 | 4760 | 1080 | 2320 | 2010 | 18200 |
| ANTIMONY | 12 | -- | -- | -- | -- | -- | -- |
| ARSENIC | 2 | 24.4NJ | -- | -- | 2.6NJ | -- | 1060J |
| BARIUM | 40 | -- | -- | -- | -- | -- | -- |
| BERYLLIUM | 1 | -- | -- | -- | -- | -- | -- |
| CADMIUM | 1 | -- | -- | -- | -- | -- | 1.5 |
| CALCIUM | 1000 | -- | -- | -- | -- | -- | 3100 |
| CHROMIUM | 2 | 28.8N*J | 42.6N*J | 18.4N*J | 12.8J | 5.1J | 18.8J |
| COBALT | 10 | -- | -- | -- | -- | -- | -- |
| COPPER | 5 | 6.3 | -- | -- | -- | -- | 8.3 |
| CYANIDE | 2 | -- | -- | -- | -- | -- | -- |
| IRON | 20 | 25800* | 24200* | 9740* | 7600 | 8010 | 18000 |
| LEAD | 0.6 | 18.8 | 7.7 | 2.1 | 1.85*J | 2.5*J | 155*J |
| MAGNESIUM | 1000 | -- | -- | -- | -- | -- | -- |
| MANGANESE | 3 | 143 | 77.1 | 8.2 | 36.2 | 70 | 112 |
| MERCURY | 0.2 | -- | -- | -- | -- | -- | -- |
| NICKEL | 8 | -- | -- | -- | -- | -- | -- |
| POTASSIUM | 1000 | -- | -- | -- | -- | -- | -- |
| SELENIUM | 1 | -- | -- | -- | -- | -- | -- |
| SILVER | 2 | -- | -- | -- | -- | -- | -- |
| SODIUM | 1000 | -- | -- | -- | -- | -- | -- |
| THALLIUM | 2 | -- | -- | -- | -- | -- | -- |
| VANADIUM | 10 | 73.4 | 69.6 | 25 | 23.6J | 23.2J | 43.3J |
| ZINC | 4 | 27.7J | 5.7J | 10.4J | 7.9 | 6.4 | 21.2 |

-- Compound analyzed and reported in database as:
detected in blank (B) or
invalid/rejected (R) or
below detection limit (U)

DRAFT

TABLE 4-31

ANGLE BORING - SOIL SAMPLES

ORGANIC COMPOUNDS DETECTED

| SAMPLE ID<br>COMPOUND | Detection<br>Limit | AB3<br>WRIAB3BF2 | AB3<br>WRIAB3IF | AB4<br>WRIAB4BF | AB5<br>WRIAB5BF | AB5<br>WRIAB5NS | VB<br>WRIVBC5 |
|---|---|---|---|---|---|---|---|
| PESTICIDES (UG/KG) | | | | | | | |
| 4,4'-DDD | 16 | — | — | 400CJ | — | — | — |
| 4,4'-DDE | 16 | — | — | — | — | — | 20 |
| 4,4'-DDT | 16 | — | — | 1400CJ | 22 | — | 150J |
| ALPHA-CHLORDANE | 80 | — | — | 200C | — | — | — |
| BHC-ALPHA | 8 | — | — | 220 | — | — | — |
| BHC-BETA | 8 | — | — | — | — | — | 35 |
| BHC-DELTA | 8 | — | — | 59 | — | — | — |
| BHC-GAMMA(LINDANE) | 8 | — | — | 75CJ | — | — | — |
| ENDRIN | 16 | — | — | 350 | — | — | — |
| GAMMA-CHLORDANE | 80 | — | — | 300CJ | — | — | — |
| TOXAPHENE | 160 | — | — | 7000C | — | — | 630 |
| SEMIVOLATILE ORGANICS (UG/KG) | | | | | | | |
| 2-METHYLNAPHTHALENE | 330 | 240J | — | 98J | — | — | — |
| 3,3'-DICHLOROBENZIDINE | 660 | — | — | — | — | — | — |
| BENZO(A)ANTHRACENE | 330 | — | — | — | — | — | — |
| BENZO(B)FLUORANTHENE | 330 | — | — | — | — | — | — |
| FLUORANTHENE | 330 | — | — | 55J | — | — | — |
| FLUORENE | 330 | — | — | — | — | — | — |
| NAPHTHALENE | 330 | 140J | — | 44J | — | — | — |
| PENTACHLOROPHENOL | 1600 | 160J | 500J | 480J | — | — | — |
| PHENANTHRENE | 330 | — | — | 96J | — | — | — |
| PYRENE | 330 | — | — | 60J | — | — | — |
| VOLATILE ORGANICS (UG/KG) | | | | | | | |
| TRIMETHYLBENZENE | | — | — | 7.4J | — | — | — |
| ACETONE | 10 | — | — | — | — | 63J | — |
| CARBON DISULFIDE | 5 | — | — | — | — | — | — |
| CHLOROBENZENE | | 11 | — | — | — | — | — |
| ETHYLBENZENE | | 120 | — | — | — | — | — |
| TOLUENE | | 4J | — | — | — | — | — |
| XYLENE (TOTAL) | | 1300E | — | — | — | — | — |

Note: no organic compounds were detected in samples AB15BI, AB219F, AB28BI, AB35BI, AB3510C, AB45BI, AB49BI, AB414B, AB5DBF, VBC10 AND VBC20

— Compounds analyzed and reported in database as:

detected in blank (B) or

invalid/rejected (R) or

below detection limit (U)

DRAFT

TABLE 4-31

ANGLE BORING – SOIL SAMPLES

ORGANIC COMPOUNDS DETECTED

| SAMPLE ID<br>COMPOUND | Detection<br>Limit | WRIAB1-BF | WRIAB1-IF | WRIAB110BI | WRIAB2IF | WRIAB35BI | WRIAB3BF1 |
|---|---|---|---|---|---|---|---|
| PESTICIDES (UG/KG) | | | | | | | |
| 4,4'-DDD | 16 | 29J | — | — | — | — | — |
| 4,4'-DDE | 16 | 26J | — | — | — | — | — |
| 4,4'-DDT | 16 | 260J | — | — | — | — | 440CJ |
| ALPHA-CHLORDANE | 80 | — | — | — | — | — | — |
| BHC-ALPHA | 8 | — | — | — | — | — | — |
| BHC-BETA | 8 | — | — | — | — | — | — |
| BHC-DELTA | 8 | — | — | — | — | — | — |
| BHC-GAMMA(LINDANE) | 8 | — | — | — | — | — | — |
| ENDRIN | 16 | — | — | — | — | — | — |
| GAMMA-CHLORDANE | 80 | — | — | — | — | — | — |
| TOXAPHENE | 160 | 930J | — | — | — | — | — |
| SEMIVOLATILE ORGANICS (UG/KG) | | | | | | | |
| 2-METHYLNAPHTHALENE | 330 | — | — | — | — | — | 80J |
| 3,3'-DICHLOROBENZIDINE | 660 | — | — | — | — | — | 740J |
| BENZO(A)ANTHRACENE | 330 | — | — | — | — | — | 83J |
| BENZO(B)FLUORANTHENE | 330 | — | — | — | — | — | 44J |
| FLUORANTHENE | 330 | — | — | — | — | — | 170J |
| FLUORENE | 330 | — | — | — | — | — | 40J |
| NAPHTHALENE | 330 | — | — | — | — | — | 74J |
| PENTACHLOROPHENOL | 1600 | — | — | — | — | 130J | 95J |
| PHENANTHRENE | 330 | — | — | — | — | — | 180J |
| PYRENE | 330 | — | — | — | — | — | 110J |
| VOLATILE ORGANICS (UG/KG) | | | | | | | |
| TRIMETHYLBENZENE | | — | — | — | — | — | — |
| ACETONE | 10 | — | — | — | — | — | — |
| CARBON DISULFIDE | 5 | — | — | 5J | 1J | — | — |
| CHLOROBENZENE | | — | 2J | — | — | — | — |
| ETHYLBENZENE | | — | — | — | — | — | — |
| TOLUENE | | — | — | — | — | — | — |
| XYLENE (TOTAL) | | — | — | — | — | — | — |

— Compounds analyzed and reported in database as:

detected in blank (B) or

invalid/rejected (R) or

below detection limit (U)

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WOOLFOLK CHEMICAL WORKS--FS
HYDROLOGIC EVALUATION OF EXISTING CAP PERFORMANCE

FORT VALLEY, GEORGIA
JULY 5, 1994

**********
**********

FAIR GRASS

LAYER 1
---

VERTICAL PERCOLATION LAYER (VEGETATIVE LAYER)

| | | |
|---|---|---|
| THICKNESS | = | 24.00 INCHES |
| POROSITY | = | 0.3762 VOL/VOL |
| FIELD CAPACITY | = | 0.2029 VOL/VOL |
| WILTING POINT | = | 0.1157 VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.2029 VOL/VOL |
| SATURATED HYDRAULIC CONDUCTIVITY | = | 0.000055499997 CM/SEC |

LAYER 2
---

LATERAL DRAINAGE LAYER (GRANULAR DRAINAGE LAYER)

| | | |
|---|---|---|
| THICKNESS | = | 12.00 INCHES |
| POROSITY | = | 0.3509 VOL/VOL |
| FIELD CAPACITY | = | 0.0705 VOL/VOL |
| WILTING POINT | = | 0.0326 VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.0705 VOL/VOL |
| SATURATED HYDRAULIC CONDUCTIVITY | = | 0.000154999987 CM/SEC |
| SLOPE | = | 3.00 PERCENT |
| DRAINAGE LENGTH | = | 100.0 FEET |

LAYER 3
---

BARRIER SOIL LINER WITH FLEXIBLE MEMBRANE LINER

| | | |
|---|---|---|
| THICKNESS | = | 24.00 INCHES |
| POROSITY | = | 0.4300 VOL/VOL |
| FIELD CAPACITY | = | 0.3663 VOL/VOL |
| WILTING POINT | = | 0.2802 VOL/VOL |
| INITIAL SOIL WATER CONTENT | = | 0.4300 VOL/VOL |
| SATURATED HYDRAULIC CONDUCTIVITY | = | 0.000000600000 CM/SEC |
| LINER LEAKAGE FRACTION | = | 0.00010000 |

## GENERAL SIMULATION DATA

| | | |
|---|---|---|
| SCS RUNOFF CURVE NUMBER | = | 79.01 |
| TOTAL AREA OF COVER | = | 43500. SQ FT |
| EVAPORATIVE ZONE DEPTH | = | 22.00 INCHES |
| UPPER LIMIT VEG. STORAGE | = | 8.2764 INCHES |
| INITIAL VEG. STORAGE | = | 8.2195 INCHES |
| INITIAL SNOW WATER CONTENT | = | 0.0000 INCHES |
| INITIAL TOTAL WATER STORAGE IN SOIL AND WASTE LAYERS | = | 16.0356 INCHES |

SOIL WATER CONTENT INITIALIZED BY PROGRAM.

## CLIMATOLOGICAL DATA

DEFAULT RAINFALL WITH SYNTHETIC DAILY TEMPERATURES AND
SOLAR RADIATION FOR ATLANTA GEORGIA

| | | |
|---|---|---|
| MAXIMUM LEAF AREA INDEX | = | 3.00 |
| START OF GROWING SEASON (JULIAN DATE) | = | 92 |
| END OF GROWING SEASON (JULIAN DATE) | = | 312 |

NORMAL MEAN MONTHLY TEMPERATURES, DEGREES FAHRENHEIT

| JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|
| 41.90 | 44.90 | 52.50 | 61.80 | 69.30 | 75.80 |
| 78.60 | 78.20 | 73.00 | 62.20 | 52.00 | 44.50 |

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MONTHLY TOTALS FOR YEAR 74

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION (INCHES) | 5.36 | 6.37 | 2.44 | 3.72 | 3.83 | 3.20 |
| | 4.64 | 6.26 | 1.06 | 1.22 | 3.89 | 5.31 |
| RUNOFF (INCHES) | 3.984 | 4.261 | 0.000 | 1.252 | 0.000 | 0.043 |
| | 0.116 | 0.080 | 0.000 | 0.000 | 0.111 | 0.422 |
| EVAPOTRANSPIRATION (INCHES) | 1.383 | 2.608 | 2.223 | 3.165 | 6.790 | 4.316 |
| | 4.390 | 5.178 | 2.200 | 0.902 | 1.506 | 1.437 |
| LATERAL DRAINAGE FROM LAYER 2 (INCHES) | 0.1328 | 0.1161 | 0.1011 | 0.1022 | 0.0831 | 0.0568 |
| | 0.0571 | 0.0565 | 0.0540 | 0.0548 | 0.0519 | 0.0621 |
| PERCOLATION FROM LAYER 3 (INCHES) | 0.0002 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

MONTHLY SUMMARIES FOR DAILY HEADS

| | | | | | | |
|---|---|---|---|---|---|---|
| AVG. DAILY HEAD ON LAYER 3 (INCHES) | 35.72 | 34.83 | 29.06 | 30.04 | 23.95 | 14.26 |
| | 13.56 | 13.23 | 12.91 | 12.39 | 11.93 | 15.18 |
| STD. DEV. OF DAILY HEAD ON LAYER 3 (INCHES) | 0.35 | 1.11 | 1.10 | 2.31 | 3.31 | 1.08 |
| | 0.10 | 0.10 | 0.09 | 0.33 | 0.03 | 7.46 |

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ANNUAL TOTALS FOR YEAR 74

| | (INCHES) | (CU. FT.) | PERCENT |
|---|---|---|---|
| PRECIPITATION | 47.30 | 171462. | 100.00 |
| RUNOFF | 10.270 | 37229. | 21.71 |
| EVAPOTRANSPIRATION | 36.099 | 130859. | 76.32 |

| | | | |
|---|---|---|---|
| LATERAL DRAINAGE FROM LAYER 2 | 0.9285 | 3366. | 1.96 |
| PERCOLATION FROM LAYER 3 | 0.0014 | 5. | 0.00 |
| CHANGE IN WATER STORAGE | 0.001 | 3. | 0.00 |
| SOIL WATER AT START OF YEAR | 23.48 | 85132. | |
| SOIL WATER AT END OF YEAR | 23.49 | 85135. | |
| SNOW WATER AT START OF YEAR | 0.00 | 0. | |
| SNOW WATER AT END OF YEAR | 0.00 | 0. | |
| ANNUAL WATER BUDGET BALANCE | 0.00 | 0. | 0.00 |

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MONTHLY TOTALS FOR YEAR 75

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION (INCHES) | 6.19 | 8.98 | 8.31 | 4.28 | 4.62 | 5.52 |
| | 8.52 | 3.30 | 2.99 | 5.31 | 4.62 | 3.36 |
| RUNOFF (INCHES) | 4.640 | 6.974 | 4.088 | 2.039 | 0.003 | 0.017 |
| | 0.543 | 0.000 | 0.000 | 0.672 | 0.645 | 0.013 |
| EVAPOTRANSPIRATION | 1.893 | 1.901 | 3.627 | 3.732 | 6.266 | 7.003 |
| (INCHES) | 6.447 | 4.822 | 3.523 | 2.767 | 1.921 | 2.086 |
| LATERAL DRAINAGE FROM | 0.1303 | 0.1166 | 0.1211 | 0.1096 | 0.0881 | 0.0576 |
| LAYER 2 (INCHES) | 0.0572 | 0.0565 | 0.0541 | 0.0549 | 0.0541 | 0.0731 |
| PERCOLATION FROM | 0.0002 | 0.0001 | 0.0002 | 0.0001 | 0.0001 | 0.0001 |
| LAYER 3 (INCHES) | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

MONTHLY SUMMARIES FOR DAILY HEADS

| | | | | | | |
|---|---|---|---|---|---|---|
| AVG. DAILY HEAD ON | 35.19 | 34.97 | 33.36 | 31.61 | 25.55 | 14.60 |
| LAYER 3 (INCHES) | 13.59 | 13.26 | 12.94 | 12.46 | 13.06 | 20.79 |
| STD. DEV. OF DAILY HEAD | 0.73 | 1.07 | 1.85 | 2.42 | 2.89 | 1.46 |
| ON LAYER 3 (INCHES) | 0.10 | 0.10 | 0.09 | 0.32 | 1.79 | 2.22 |

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ANNUAL TOTALS FOR YEAR 75

| | (INCHES) | (CU. FT.) | PERCENT |
|---|---|---|---|
| PRECIPITATION | 66.00 | 239250. | 100.00 |
| RUNOFF | 19.632 | 71168. | 29.75 |
| EVAPOTRANSPIRATION | 45.988 | 166705. | 69.68 |
| LATERAL DRAINAGE FROM LAYER 2 | 0.9730 | 3527. | 1.47 |
| PERCOLATION FROM LAYER 3 | 0.0014 | 5. | 0.00 |
| CHANGE IN WATER STORAGE | -0.594 | -2155. | -0.90 |
| SOIL WATER AT START OF YEAR | 23.49 | 85135. | |
| SOIL WATER AT END OF YEAR | 22.89 | 82981. | |
| SNOW WATER AT START OF YEAR | 0.00 | 0. | |
| SNOW WATER AT END OF YEAR | 0.00 | 0. | |
| ANNUAL WATER BUDGET BALANCE | 0.00 | 0. | 0.00 |

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MONTHLY TOTALS FOR YEAR 76

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION (INCHES) | 5.15 | 1.84 | 10.95 | 1.49 | 6.99 | 2.36 |
| | 4.29 | 0.50 | 0.72 | 3.55 | 4.11 | 3.77 |
| RUNOFF (INCHES) | 2.685 | 0.000 | 6.440 | 0.000 | 1.088 | 0.000 |
| | 0.202 | 0.000 | 0.000 | 0.120 | 0.009 | 0.117 |
| EVAPOTRANSPIRATION | 2.146 | 2.680 | 2.986 | 2.295 | 6.201 | 6.272 |
| (INCHES) | 4.328 | 0.719 | 0.742 | 2.094 | 2.267 | 1.673 |
| LATERAL DRAINAGE FROM | 0.1167 | 0.1046 | 0.1127 | 0.1000 | 0.0890 | 0.0670 |
| LAYER 2 (INCHES) | 0.0574 | 0.0568 | 0.0543 | 0.0555 | 0.0522 | 0.0667 |
| PERCOLATION FROM | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| LAYER 3 (INCHES) | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

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MONTHLY SUMMARIES FOR DAILY HEADS

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| | | | | | | |
|---|---|---|---|---|---|---|
| AVG. DAILY HEAD ON | 32.50 | 31.38 | 31.62 | 29.44 | 26.09 | 18.55 |
| LAYER 3 (INCHES) | 13.71 | 13.38 | 13.06 | 12.74 | 12.01 | 17.09 |
| STD. DEV. OF DAILY HEAD | 2.49 | 1.37 | 2.68 | 2.09 | 1.97 | 4.80 |
| ON LAYER 3 (INCHES) | 0.10 | 0.10 | 0.09 | 0.09 | 0.14 | 7.31 |

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ANNUAL TOTALS FOR YEAR 76

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| | (INCHES) | (CU. FT.) | PERCENT |
|---|---|---|---|
| PRECIPITATION | 45.72 | 165735. | 100.00 |
| RUNOFF | 10.662 | 38648. | 23.32 |
| EVAPOTRANSPIRATION | 34.402 | 124706. | 75.24 |
| LATERAL DRAINAGE FROM LAYER 2 | 0.9328 | 3381. | 2.04 |
| PERCOLATION FROM LAYER 3 | 0.0014 | 5. | 0.00 |

| | | | |
|---|---|---|---|
| CHANGE IN WATER STORAGE | -0.278 | -1006. | -0.61 |
| SOIL WATER AT START OF YEAR | 22.89 | 82981. | |
| SOIL WATER AT END OF YEAR | 22.61 | 81975. | |
| SNOW WATER AT START OF YEAR | 0.00 | 0. | |
| SNOW WATER AT END OF YEAR | 0.00 | 0. | |
| ANNUAL WATER BUDGET BALANCE | 0.00 | 0. | 0.00 |

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MONTHLY TOTALS FOR YEAR 77

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION (INCHES) | 3.67 | 2.20 | 6.27 | 1.73 | 2.09 | 3.03 |
| | 4.26 | 4.23 | 4.85 | 5.05 | 6.90 | 2.63 |
| RUNOFF (INCHES) | 1.392 | 0.157 | 1.895 | 0.646 | 0.000 | 0.204 |
| | 0.427 | 0.565 | 0.207 | 0.760 | 2.578 | 0.027 |
| EVAPOTRANSPIRATION (INCHES) | 2.083 | 1.348 | 3.982 | 2.771 | 4.737 | 3.749 |
| | 2.120 | 4.503 | 4.589 | 3.099 | 1.978 | 1.517 |
| LATERAL DRAINAGE FROM LAYER 2 (INCHES) | 0.1215 | 0.0924 | 0.1216 | 0.1054 | 0.0812 | 0.0561 |
| | 0.0571 | 0.0564 | 0.0540 | 0.0547 | 0.0775 | 0.0922 |
| PERCOLATION FROM LAYER 3 (INCHES) | 0.0002 | 0.0001 | 0.0002 | 0.0001 | 0.0001 | 0.0001 |
| | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

MONTHLY SUMMARIES FOR DAILY HEADS

| | | | | | | |
|---|---|---|---|---|---|---|
| AVG. DAILY HEAD ON LAYER 3 (INCHES) | 33.44 | 29.34 | 33.50 | 30.65 | 23.22 | 13.96 |
| | 13.53 | 13.21 | 12.89 | 12.33 | 22.56 | 27.07 |

| | | | | | | |
|---|---|---|---|---|---|---|
| STD. DEV. OF DAILY HEAD | 1.71 | 1.28 | 1.29 | 2.99 | 3.98 | 0.46 |
| ON LAYER 3 (INCHES) | 0.10 | 0.10 | 0.09 | 0.34 | 6.79 | 0.05 |

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ANNUAL TOTALS FOR YEAR 77

| | (INCHES) | (CU. FT.) | PERCENT |
|---|---|---|---|
| PRECIPITATION | 46.91 | 170049. | 100.00 |
| RUNOFF | 8.859 | 32113. | 18.88 |
| EVAPOTRANSPIRATION | 36.475 | 132221. | 77.75 |
| LATERAL DRAINAGE FROM LAYER 2 | 0.9702 | 3517. | 2.07 |
| PERCOLATION FROM LAYER 3 | 0.0014 | 5. | 0.00 |
| CHANGE IN WATER STORAGE | 0.605 | 2192. | 1.29 |
| SOIL WATER AT START OF YEAR | 22.61 | 81975. | |
| SOIL WATER AT END OF YEAR | 23.22 | 84167. | |
| SNOW WATER AT START OF YEAR | 0.00 | 0. | |
| SNOW WATER AT END OF YEAR | 0.00 | 0. | |
| ANNUAL WATER BUDGET BALANCE | 0.00 | 0. | 0.00 |

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MONTHLY TOTALS FOR YEAR 78

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| PRECIPITATION (INCHES) | 7.04 | 0.33 | 3.07 | 3.49 | 7.28 | 2.86 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 2.26 | 5.96 | 0.78 | 1.58 | 2.96 | 3.74 |
| RUNOFF (INCHES) | 5.107 | 0.000 | 0.135 | 0.099 | 1.174 | 0.007 |
| | 0.000 | 0.621 | 0.000 | 0.173 | 0.140 | 0.580 |
| EVAPOTRANSPIRATION | 2.050 | 1.222 | 2.670 | 3.556 | 6.540 | 6.326 |
| (INCHES) | 2.035 | 5.523 | 0.814 | 1.414 | 1.005 | 1.527 |
| LATERAL DRAINAGE FROM | 0.1268 | 0.0955 | 0.1107 | 0.0979 | 0.0982 | 0.0629 |
| LAYER 2 (INCHES) | 0.0575 | 0.0568 | 0.0543 | 0.0555 | 0.0523 | 0.0533 |
| PERCOLATION FROM | 0.0002 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| LAYER 3 (INCHES) | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |

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MONTHLY SUMMARIES FOR DAILY HEADS

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| | | | | | | |
|---|---|---|---|---|---|---|
| AVG. DAILY HEAD ON | 34.58 | 30.06 | 31.15 | 29.08 | 27.90 | 17.04 |
| LAYER 3 (INCHES) | 13.73 | 13.40 | 13.08 | 12.76 | 12.06 | 11.87 |
| STD. DEV. OF DAILY HEAD | 1.41 | 1.44 | 2.52 | 1.02 | 4.31 | 2.47 |
| ON LAYER 3 (INCHES) | 0.10 | 0.10 | 0.09 | 0.09 | 0.21 | 0.04 |

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ANNUAL TOTALS FOR YEAR 78

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| | (INCHES) | (CU. FT.) | PERCENT |
|---|---|---|---|
| PRECIPITATION | 41.35 | 149894. | 100.00 |
| RUNOFF | 8.036 | 29129. | 19.43 |
| EVAPOTRANSPIRATION | 34.680 | 125717. | 83.87 |
| LATERAL DRAINAGE FROM LAYER 2 | 0.9217 | 3341. | 2.23 |
| PERCOLATION FROM LAYER 3 | 0.0014 | 5. | 0.00 |
| CHANGE IN WATER STORAGE | -2.289 | -8298. | -5.54 |
| SOIL WATER AT START OF YEAR | 23.22 | 84167. | |
| SOIL WATER AT END OF YEAR | 20.93 | 75868. | |

| | | | |
|---|---|---|---|
| SNOW WATER AT START OF YEAR | 0.00 | 0. | |
| SNOW WATER AT END OF YEAR | 0.00 | 0. | |
| ANNUAL WATER BUDGET BALANCE | 0.00 | 0. | 0.00 |

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AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 74 THROUGH 78

| | JAN/JUL | FEB/AUG | MAR/SEP | APR/OCT | MAY/NOV | JUN/DEC |
|---|---|---|---|---|---|---|
| **PRECIPITATION** | | | | | | |
| TOTALS | 5.48 | 3.94 | 6.21 | 2.94 | 4.96 | 3.39 |
| | 4.79 | 4.05 | 2.08 | 3.34 | 4.50 | 3.76 |
| STD. DEVIATIONS | 1.26 | 3.60 | 3.57 | 1.25 | 2.19 | 1.23 |
| | 2.28 | 2.33 | 1.81 | 1.90 | 1.47 | 0.98 |
| **RUNOFF** | | | | | | |
| TOTALS | 3.562 | 2.279 | 2.512 | 0.807 | 0.453 | 0.054 |
| | 0.258 | 0.253 | 0.041 | 0.345 | 0.696 | 0.232 |
| STD. DEVIATIONS | 1.517 | 3.196 | 2.750 | 0.851 | 0.620 | 0.085 |
| | 0.224 | 0.313 | 0.093 | 0.346 | 1.080 | 0.255 |
| **EVAPOTRANSPIRATION** | | | | | | |
| TOTALS | 1.911 | 1.952 | 3.097 | 3.104 | 6.106 | 5.533 |
| | 3.864 | 4.149 | 2.374 | 2.055 | 1.735 | 1.648 |
| STD. DEVIATIONS | 0.310 | 0.682 | 0.711 | 0.585 | 0.801 | 1.414 |
| | 1.840 | 1.955 | 1.685 | 0.913 | 0.490 | 0.259 |
| **LATERAL DRAINAGE FROM LAYER 2** | | | | | | |
| TOTALS | 0.1256 | 0.1050 | 0.1135 | 0.1030 | 0.0879 | 0.0601 |
| | 0.0573 | 0.0566 | 0.0541 | 0.0551 | 0.0576 | 0.0695 |
| STD. DEVIATIONS | 0.0066 | 0.0112 | 0.0084 | 0.0046 | 0.0066 | 0.0047 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 0.0002 | 0.0002 | 0.0002 | 0.0004 | 0.0112 | 0.0146 |

PERCOLATION FROM LAYER 3

| | | | | | | |
|---|---|---|---|---|---|---|
| TOTALS | 0.0002 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| STD. DEVIATIONS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 74 THROUGH 78

| | (INCHES) | | (CU. FT.) | PERCENT |
|---|---|---|---|---|
| PRECIPITATION | 49.46 | ( 9.546) | 179278. | 100.00 |
| RUNOFF | 11.492 | ( 4.673) | 41657. | 23.24 |
| EVAPOTRANSPIRATION | 37.529 | ( 4.811) | 136042. | 75.88 |
| LATERAL DRAINAGE FROM LAYER 2 | 0.9452 | ( 0.0244) | 3426. | 1.91 |
| PERCOLATION FROM LAYER 3 | 0.0014 | ( 0.0000) | 5. | 0.00 |
| CHANGE IN WATER STORAGE | -0.511 | ( 1.087) | -1853. | -1.03 |

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PEAK DAILY VALUES FOR YEARS 74 THROUGH 78

| | (INCHES) | (CU. FT.) |
|---|---|---|
| PRECIPITATION | 3.43 | 12433.7 |
| RUNOFF | 3.210 | 11635.7 |
| LATERAL DRAINAGE FROM LAYER 2 | 0.0043 | 15.7 |
| PERCOLATION FROM LAYER 3 | 0.0000 | 0.0 |

| | | |
|---|---|---|
| HEAD ON LAYER 3 | 36.2 | |
| SNOW WATER | 1.26 | 4567.5 |

MAXIMUM VEG. SOIL WATER (VOL/VOL) 0.3762

MINIMUM VEG. SOIL WATER (VOL/VOL) 0.1157

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FINAL WATER STORAGE AT END OF YEAR 78

| LAYER | (INCHES) | (VOL/VOL) |
|---|---|---|
| 1 | 6.45 | 0.2689 |
| 2 | 4.16 | 0.3464 |
| 3 | 10.32 | 0.4300 |
| SNOW WATER | 0.00 | |

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# Appendix G
# Calculation of Risks Associated with Remedial Alternatives

DRAFT

# Calculation of Risks Associated with Remedial Alternatives
# Woolfolk Chemical Works Site

August 1, 1994

Prepared by:
Industrial Compliance
Toxicology and Health Related Sciences
3900 N. Rodney Parham Road, Suite 211
Little Rock, Arkansas 72212

## 1.0 Introduction and Objective

The feasibility study prepared by CH2MHill proposes seven (7) alternate remedies for the Woolfolk Chemical Works Facility ("Woolfolk Facility"). These seven alternatives consist of no action, land improvements, soil consolidation, construction of a Resource Conservation and Recovery Act (RCRA) landfill, treatment and landfilling of hazardous soil, *in situ* treatment of hazardous soil, and finally, soil excavation, stabilization, and commercial landfilling of contaminated soil. Excavation of off-site soils was not considered since the remaining properties would not require substantial excavation. The objective of this assessment is to estimate the human health risks associated with the seven proposed remedies.

## 2.0 Description of Assumptions Used to Calculate Exposures and Risks During Remediation

### 2.1 Exposed Persons

The on-site remediation worker will be protected in Level C (which is likely to include an air-purifying respirator [illegible]s, gloves, and other equipment) protection. Properly worn [illegible] ection should prevent contact with the chemicals of conc[illegible] ngestion, inhalation, and skin contact routes of exposure. [illegible] orkers may experience higher exposures than persons we[illegible] uipment. Therefore, IC has considered the risks associat[illegible] o soil during remediation for the on-site SureCo worker.

### 2.2 Chemicals of Concern in S[illegible]

From the results of the baseline risk assessment, nearly all of the risk attributable to the Facility is due to arsenic exposure. Therefore, IC considers only the risks associated with exposure to arsenic in soil in calculating risks associated with remediating soils. This simplification is unlikely to significantly underestimate risk.

## 2.3 Air Concentration of Dust and Arsenic Concentration In Off-site Soils

From discussions between Industrial Compliance and CH2MHill, air dust levels of 0.28 $mg/m^3$ or 7 $mg/m^3$ were assigned to various remedial activities in accord with the amount of dust each activity would generate. For example, excavation is likely to generate considerable amounts of dust and for days on which excavation will be conducted, an average air dust (dust generated from affected Facility soil) concentration was assumed to be 7 $mg/m^3$. For other activities which were assumed to involve less dust generation such as construction of a landfill cap, the average dust level was assumed to be the lower value (0.28 $mg/m^3$).

The 0.28 $mg/m^3$ dust level was considered representative of a median dust concentration in accord with the range of dust concentrations reported for air in a general construction area during building construction (range: 0.094 $mg/m^3$ to 0.593 $mg/m^3$) (Cowherd et al., 1974). It is noteworthy that this value is only two times higher than the highest ambient dust concentration reported (0.13 $mg/m^3$) at the Woolfolk Facility during air sampling conducted in May and June 1992.

The 7 $mg/m^3$ dust concentration was empirically derived from dust monitoring during operation of vehicles on unpaved roads and operation of agricultural tillers. For example, the median dust concentration behind a vehicle operated on an unpaved road was 7 $mg/m^3$ (range: 0.90 $mg/m^3$ to 30.9 $mg/m^3$) (Cowherd et al., 1974). For comparison, the median air dust concentration detected behind an agricultural tiller was 15 $mg/m^3$ (range: 0.86 $mg/m^3$ to 75.9 $mg/m^3$) (Cowherd et al., 1974). The Occupational Safety and Health Administration permissible exposure limit for particulates in air which are not otherwise regulated (for example, dust originating from soil) is 15 $mg/m^3$.

Since dust suppression measures will likely be instituted during remediation, IC examined the effect of dust suppression on the assumed air concentrations of dust at the Facility. The USEPA has determined that water sprays and water sprays with surfactant reduce dust generation by approximately 40% to 70% during active excavation (EPA, 1989). For this reason, IC reduced the

above air dust concentrations (7 $mg/m^3$ and 0.28 $mg/m^3$) 55% to account for dust suppression. Therefore, the effective dust concentrations used for estimating inhalation exposures during remediation were 0.126 $mg/m^3$ for remedial operations which generate less dust and 3.15 $mg/m^3$ for operations which generate considerable amounts of dust.

### 2.4 Calculation of Arsenic Exposures/Risks

Representative arsenic concentrations in soil were taken from upper 95% confidence limits and mean concentrations calculated for the risk assessment. On-site arsenic concentrations were assumed to be 1818 mg/kg (95% upper confidence limit). If remediation was assumed to involve the Facility as a whole (remedial alternative 2), the average on-site arsenic concentration was used (721 mg/kg). Arsenic concentration for the cap material was assumed to be 4342 mg/kg (personal communication, CH2MHill).

Weighted dust levels were calculated for each alternative by multiplying the assumed dust level for each activity by the number of days for the activity. These products were then summed and divided by the total number of days required for the alternative. Weighted concentrations of arsenic in soil were also calculated in a similar manner. Weighted average air dust and soil arsenic concentrations for each remedy are presented in Table 1.

On-site workers were assumed to be exposed to arsenic in soil during remediation via ingestion of dust, inhalation of dust, and dermal contact with dust. The dermal exposure pathway contributes negligibly to overall arsenic exposure. Soil exposure assumptions used in preparing estimates of risk due to remediation were virtually identical to those used in the baseline risk assessment.

Workers were assumed to ingest 50 mg of dust during days when remediation was taking place. Workers were also assumed to inhale 20 $m^3$ of air per day. The forearms and hands were assumed to be exposed to dust.

To assess noncarcinogenic risk, exposures were adjusted by $\frac{5}{7}$ based on the fact that on-site workers would be exposed primarily on the five days of the week that remedial workers were active.

For the quantitative assessment of risk, exposure estimates were combined with the health criteria given in Table 7 and absorption factors given in Table 8 to estimate potential noncancer and cancer risks posed by exposure to arsenic in off-site soils. Risks were estimated for an RME scenario. The RME case combines RME exposure estimates with upper bound slope factors. The RME scenario is intended to provide an upper bound estimate of the potential human health risks and is likely to overestimate actual human health risks. The RME case risk estimates are often used for decision making purposes at Superfund sites.

Noncancer risks (hazard indices) were calculated by dividing the ingestion and dermal exposure estimate by 0.0003 mg/kg/day, the USEPA chronic oral reference dose for arsenic. There is no inhalation reference dose for arsenic.

To assess potential lifetime cancer risks posed by the identified pathways, the chronic daily intake (CDI) is multiplied by the slope factor for the chemical. The resulting numerical cancer risk indicates the number of additional cases of cancer that would be expected in an exposed population above those expected in that population if the exposure had not occurred. The risk values calculated in this manner are expressed in scientific notation (e.g., 1.0E-04 to 1.0E-06) and represent the number of additional cases of cancer in a given number of exposed individuals. For example, a risk of 1.0E-04 refers to 1 additional case of cancer over a lifetime in 10,000 exposed persons. A risk of 1.0E-05 refers to 1 additional case of cancer over a lifetime in 100,000 exposed persons, and so on.

## 2.5 Transportation Risks

The benefits from reducing health risks to local residents from removal of on-site contaminants versus the risks of injury from the remediation activity should not be overlooked in risk assessments. A significant source of injury

risk from remedial activities involves the use of trucks to remove contaminated soil or bring clean soil or other materials. Remedial activities may require literally thousands of "truck trips" to and from the facility. The increase in vehicular traffic may increase the risk of motor vehicle accidents/injuries for the community.

Mar et al (1993) found transportation risks for removal of contaminated soil from a small town in Washington were significantly higher than the health risks from the contaminant itself. Transportation risks for the Woolfolk site were modeled using assumptions similar to those in the Mar et al study.

For each of the seven alternatives, the amount of material which would need to be removed or transported to the site was estimated as shown in Table 9 (personal communication, CH2MHill). The number of trucks required to transport this material was determined assuming that each truck would carry approximately 13 cubic yards or 20 tons of material. Depending on the material being transported and destination, round trip mileage for each truck trip was estimated and adjusted for the number of local or city miles and the number of rural highway miles.

It was assumed that reportable accidents involving remediation-related vehicles would occur at the rate of 10.7 accidents per million truck miles for city streets and at a rate of 3.71 accidents per million truck miles for rural/limited access highways as cited by Mar et al. The percentage of accidents causing fatalities or injuries also were based on figures reported by Mar et al. Transportation risks associated with each of the alternatives are summarized in the tables below.

| Alternative | Local/urban miles | Rural highway miles | Total miles | Expected number of accidents* |
|---|---|---|---|---|
| 2 | 13,435 | 24,715 | 38,150 | 0.24 |
| 3 | 87,625 | 87,625 | 175,250 | 1.26 |
| 4 | 113,450 | 113,450 | 226,900 | 1.63 |
| 5 | 37,150 | 37,150 | 74,300 | 0.54 |
| 6 | 150,150 | 150,150 | 300,300 | 2.16 |
| 7 | 170,700 | 971,550 | 1,012,800 | 4.97 |
| Off-site soil | 2385 | 5565 | 7950 | 0.05 |

* assumes 3.71 accidents per 1,000,000 rural highway truck miles and 10.7 accidents per 1,000,000 local/urban truck miles

| Number of | Alternative* | | | | | |
|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 |
| **Accidents** | 0.29 | 1.31 | 1.68 | 0.59 | 2.21 | 5.02 |
| **Fatalities** | 0.00 | 0.01 | 0.02 | 0.01 | 0.02 | 0.06 |
| **Injuries** | 0.12 | 0.59 | 0.75 | 0.26 | 0.99 | 2.25 |
| **Disabling injuries** | 0.02 | 0.07 | 0.10 | 0.03 | 0.13 | 0.29 |
| **Possible disabling injuries** | 0.06 | 0.30 | 0.39 | 0.13 | 0.51 | 1.16 |
| **Nondisabling injuries** | 0.04 | 0.20 | 0.26 | 0.08 | 0.34 | 0.78 |

* the off-site soil component was common to all alternative and was included in the above calculations

There are several limitations associated with the above calculations. The rate of accidents in Georgia may differ from the rate cited by Mar et al. The interpretation of city and rural highways may differ. However, these differences are unlikely to significantly affect the overall interpretation that there are significant risks of an accident or death associated with the increase in vehicular traffic from remediation activities. While a certain amount of this type of risk is unavoidable, it should be noted that extremely conservative remediation goals may unnecessarily increase these risks.

### 2.6 Summary of Calculated Risks

Noncarcinogenic and carcinogenic risks for the various remedial alternatives are presented in Table 2.

Noncancer risks for arsenic exposure exceeded 1.0 for remedies 2 through 7. Relatively little difference was observed between remedies with regard to noncancer risk.

Lifetime cancer risk associated with remediation was highest for alternative 7 and lowest for alternative 2. Cancer risks associated with remedies 3, 4, 5, and 6 were between these extremes.

## 3.0 References

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**Table 1**
**Assumptions Regarding Days of Exposure Relating to Remedial Activities: Dust Levels, Soil Arsenic Levels, and Exposure Days By Remedy**

| Activity | Working days | Dust level (mg/m3) | Soil As conc (mg/kg) |
|---|---|---|---|
| **All alternatives** | | | |
| •demolish Bldg W | 25 | 0.126 | 1818 |
| **Alternative 2** | | | |
| •remove on-site debris | 10 | 3.15 | 721 |
| •place new concrete & asphalt | 25 | 0.126 | 721 |
| •construct cap over landfill | 5 | 0.126 | 721 |
| Weighted average | | 0.88 | 721 |
| **Alternative 3** | | | |
| •remove on-site debris | 10 | 3.15 | 1818 |
| •excavate on-site soil | 30 | 3.15 | 1818 |
| •construct cap over landfill | 7 | 0.126 | 1818 |
| Weighted average | | 2.70 | 1818 |
| **Alternative 4** | | | |
| •remove on-site debris | 10 | 3.15 | 1818 |
| •excavate on-site soil | 30 | 3.15 | 1818 |
| •treat soil | 15 | 3.15 | 1818 |
| •construct cap over landfill | 10 | 0.126 | 1818 |
| Weighted average | | 2.68 | 1818 |
| **Alternative 5** | | | |
| •in situ/ex situ treatment | 60 | 3.15 | 1818 |
| •remove debris | 10 | 3.15 | 1818 |
| •construct cap over landfill | 5 | 0.126 | 1818 |
| •place new asphalt | 5 | 0.126 | 1818 |
| Weighted average | | 2.77 | 1818 |
| **Alternative 6** | | | |
| •remove debris | 10 | 3.15 | 1818 |
| •excavate on-site soil | 30 | 3.15 | 1818 |
| •treat on-site soil | 15 | 3.15 | 1818 |
| •excavate existing cap | 15 | 3.15 | 4342 |
| •treat cap material | 21 | 3.15 | 4342 |
| •construct cap over landfill | 10 | 0.13 | 1818 |
| Weighted average | | 2.85 | 2718 |
| **Alternative 7** | | | |
| •excavate on-site soil | 30 | 3.15 | 1818 |
| •treat on-site soil | 15 | 3.15 | 1818 |
| •excavate existing cap | 15 | 3.15 | 4342 |
| •treat cap material | 21 | 3.15 | 4342 |
| •load cap material | 50 | 3.15 | 4342 |
| •load soil in commercial landfill | 85 | 3.15 | 1818 |
| Weighted average | | 3.15 | 2823 |

## Table 2
## Summary of Risks Associated with Remediation

| | Subchronic Hazard Index | Lifetime Cancer Risk |
|---|---|---|
| **Risks Common to All Alternatives** | | |
| •Ingestion risk | 2.5E+00 | 1.8E-06 |
| •Dermal risk | 1.37E-01 | 1E-07 |
| •Inhalation risk | - | 4.8E-07 |
| **Total risk** | **2.6E+00** | **2E-06** |
| **Alternative #2** | | |
| •Ingestion risk | 9.8E-01 | 1E-06 |
| •Dermal risk | 5.5E-02 | 7E-08 |
| •Inhalation risk | - | 2E-06 |
| Total Alternative Specific Risk | 1.0E+00 | 3E-06 |
| **Total Risk (Specific + Risk in Common with All Alternatives** | **3.6E+00** | **5E-06** |
| **Alternative #3** | | |
| •Ingestion risk | 2.5E+00 | 3E-06 |
| •Dermal risk | 1.4E-01 | 2E-07 |
| •Inhalation risk | - | 2E-05 |
| Total Alternative Specific Risk | 2.6E+00 | 2E-05 |
| **Total Risk (Specific + Risk in Common with All Alternatives** | **5.2E+00** | **2E-05** |
| **Alternative #4** | | |
| •Ingestion risk | 2.5E+00 | 5E-06 |
| •Dermal risk | 1.4E-01 | 3E-07 |
| •Inhalation risk | - | 3E-05 |
| Total Alternative Specific Risk | 2.6E+00 | 3E-05 |
| **Total Risk (Specific + Risk in Common with All Alternatives** | **5.2E+00** | **3E-05** |
| **Alternative #5** | | |
| •Ingestion risk | 2.5E+00 | 6E-06 |
| •Dermal risk | 1.4E-01 | 4E-07 |
| •Inhalation risk | - | 3E-05 |
| Total Alternative Specific Risk | 2.6E+00 | 4E-05 |
| **Total Risk (Specific + Risk in Common with All Alternatives** | **5.2E+00** | **4E-05** |
| **Alternative #6 ON-SITE WORKERS ONLY** | | |
| •Ingestion risk | 3.7E+00 | 1.1E-05 |
| •Dermal risk | 2.1E-01 | 6.1E-7 |
| •Inhalation risk | - | 6.6E-05 |
| Total Alternative Specific Risk | 3.9E+00 | 8E-05 |
| **Total Risk (Specific + Risk in Common with All Alternatives** | **5.5E+00** | **8E-05** |
| **Alternative #7** | | |
| •Ingestion risk | 3.8E+00 | 2.5E-05 |
| •Dermal risk | 2.1E-01 | 1.4E-06 |
| •Inhalation risk | - | 1.6E-04 |
| Total Alternative Specific Risk | 4.0E+00 | 2E-04 |
| **Total Risk (Specific + Risk in Common with All Alternatives** | **6.6E+00** | **2E-04** |

## Table 3
## Calculation of Intakes of Arsenic in Air and Soil

| Exposure Pathway | Exposure Equation | Exposure variables |
|---|---|---|
| **Air**<br>Inhalation of chemicals | $\frac{CA \times IR \times ET \times EF \times ED \times RF \times ABS}{BW \times AT}$ | CA = Concentration in air ($mg/m^3$)<br>IR = Inhalation rate ($m^3$/hour or $m^3$/day)<br>ET= Exposure time (hours/day; this variable not needed when IR is expressed in $m^3$/day)<br>EF = Exposure frequency (days/year)<br>ED = Exposure duration (years)<br>RF = Respirable fraction (unitless)<br>ABS = Absorption factor (unitless)<br>BW = Body weight (kg)<br>AT = Averaging time (period over which exposure is averaged (for non-carcinogens: ED x 365 days/year; for carcinogens: 70 years x 365 days/year) |
| **Soil**<br>Ingestion of soil | $\frac{CS \times IR \times FI \times EF \times ED \times CF}{BW \times AT}$ | CS = Chemical concentration in soil (mg/kg)<br>IR = Ingestion rate (mg soil/day)<br>FI = Fraction ingested from contaminated source<br>EF = Exposure frequency (days/year)<br>ED = Exposure duration (years)<br>CF = Conversion factor ($1 \times 10^{-6}$ kg/mg)<br>BW = Body weight (kg)<br>AT = Averaging time (period over which exposure is averaged (for non-carcinogens: ED x 365 days/year; for carcinogens: 70 years x 365 days/year) |
| Dermal contact with soil | $\frac{C \times SA \times ABS \times AF \times EF \times ED \times CF}{BW \times AT}$ | C = Chemical concentration in soil or sediment (mg/kg)<br>SA = Skin surface area available for contact ($cm^2$)<br>ABS = Absorption factor (unitless)<br>AF = Soil to skin adherence factor ($mg/cm^2$)<br>EF = Exposure frequency (days/year)<br>ED = Exposure duration (years)<br>CF = Conversion factor ($1 \times 10^{-6}$ kg/mg)<br>BW = Body weight (kg)<br>AT = Averaging time (period over which exposure is averaged (for non-carcinogens: ED x 365 days/year; for carcinogens: 70 years x 365 days/year) |

**Table 4**
**Summary of Exposure Assumptions: Ingestion of Arsenic in Soil**

| Receptor | Body Weight (BW) (kg) | Ingestion Rate (IR) (mg of soil/day) | Fraction ingested from contaminated source (FI) (unitless) | Respirable Fraction | Exposure Duration (ED) (years) | Exposure Frequency (EF) |
|---|---|---|---|---|---|---|
| Worker | 70 | 50 | 1 | 0.5 | 1[a] | see Table 1 |

**Table 5**
**Summary of Exposure Assumptions: Dermal Exposure to Arsenic in Soil**

| Receptor | Body Weight (BW) (kg) | Exposed Skin Surface Area (SA) ($cm^2$) | Soil Adherence Factor (AF) | Exposure Duration (ED) (years) | Exposure Frequency (EF) |
|---|---|---|---|---|---|
| Worker | 70 | 2000 | 1.0 | 1 | see Table 1 |

**Table 6**
**Summary of Exposure Assumptions: Inhalation of Chemicals in Air**

| Receptor | Body Weight (BW) (kg) | Inhalation Rate (IR) | Exposure Time (ET) | Exposure Frequency (EF) | Exposure Duration (ED) (years) |
|---|---|---|---|---|---|
| Worker | 70 | 20 $m^3$ per day[a] | - | see Table 1 | 1 |

ABS = Dermal Absorption factors used for arsenic was 0.001
References for exposure parameters: EPA, 1991a; EPA, 1989b; EPA, 1989a; LaGoy, 1987; EPA 1992; Thompson and Burmaster, 1991; - Parameter not applicable

## Table 7 Inhalation and Oral Slope Factors for Arsenic

| Chemical | Reference | Oral Slope Factor | Inhalation Slope Factor | †USEPA Weight of Evidence |
|---|---|---|---|---|
| | | $mg/kg/day^{-1}$ | $mg/kg/day^{-1}$ | |
| Arsenic | HEAST 1993 | 1.80E+00 | 5.00E+01 | A |

- = USEPA has not derived an RfD or Slope Factor

* = Slope factors derived by using interim procedure established by Region IV USEPA.

†The weight of evidence classification refers to the evidence available to classify a chemical as a human carcinogen. This USEPA classification system is given below:

A. Human carcinogen (sufficient evidence of carcinogenicity in humans)
B. Probable human carcinogen (B1-limited evidence of carcinogenicity in humans; B2-sufficient evidence of carcinogenicity in animals with inadequate evidence in humans)
C. Possible human carcinogen (limited evidence of carcinogenicity in animals, in the absence of human data)
D. Not classifiable as to human carcinogenicity (inadequate or no evidence)
E. Evidence of noncarcinogenicity for humans (no evidence of carcinogenicity in animal studies)

## Table 8 Oral, Dermal, and Inhalation Absorption Factors

| Chemical | Dermal Absorption Factor | Inhalation Absorption Factor | Oral Absorption Factor |
|---|---|---|---|
| Arsenic | 0.001 | 0.3 | 0.9 |

Table 9 Transportation risk data estimates*

| Activity | Alternative 2 | | | | Alternative 3 | | | | Alternative 4 | | | | Alternative 5 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cubic Yards | Tons | Truck trips | Truck Mileage | Cubic Yards | Tons | Truck trips | Truck Mileage | Cubic Yards | Tons | Truck trips | Truck Mileage | Cubic Yards | Tons | Truck trips | Truck Mileage |
| Excavation | 2500 | 3750 | 188 | 18800[b] | | | | | | | | | | | | |
| Concrete | 2900 | 4350 | 218 | 10900[a] | 2900 | 4350 | 218 | 10900[a] | 2900 | 4350 | 218 | 10900[a] | 2900 | 4350 | 218 | 10900[a] |
| Asphalt | 2250 | 3375 | 169 | 8450[a] | 1500 | 2250 | 113 | 5650[a] | 1500 | 2250 | 113 | 5650[a] | 5200 | 7800 | 390 | 19500[a] |
| Landfill | | | | | | | | | | | | | | | | |
| excavation | | | | | 22300 | 33450 | 1673 | 83650[a] | 22800 | 34200 | 1710 | 85500[a] | 6900 | 10350 | 518 | 25900[a] |
| sand | | | | | 4600 | 6900 | 345 | 17250[a] | 4640 | 6960 | 348 | 17400[a] | 750 | 1125 | 56 | 2800[a] |
| clay | | | | | 6900 | 10350 | 518 | 25900[a] | 11450 | 17175 | 859 | 42950[a] | 4050 | 6075 | 304 | 15200[a] |
| Backfill | | | | | 8500 | 12750 | 638 | 31900[a] | 17200 | 25800 | 1290 | 64500[a] | | | | |
| TOTAL | | | 575 | 38150 | | | 3505 | 175250 | | | 4538 | 226900 | | | 1486 | 74300 |

| Activity | Alternative 6 | | | | Alternative 7 | | | | Off-facility soil | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cubic Yards | Tons | Truck trips | Truck Mileage | Cubic Yards | Tons | Truck trips | Truck Mileage | Cubic Yards | Tons | Truck trips | Truck Mileage |
| Excavation | | | | | 22500 | 33750 | 1688 | 1012800[c] | 700 | 1050 | 53 | 5300[b] |
| Concrete | 2900 | 4350 | 218 | 10900[a] | 2900 | 4350 | 218 | 10900[a] | | | | |
| Asphalt | 1120 | 1680 | 84 | 4200[a] | 6300 | 9450 | 473 | 23650[a] | | | | |
| Landfill | | | | | | | | | | | | |
| excavation | 36400 | 54600 | 2730 | 136500[a] | | | | | | | | |
| sand | 700 | 10500 | 525 | 26250[a] | | | | | | | | |
| clay | 18450 | 27675 | 1384 | 69200[a] | | | | | | | | |
| Backfill | 14200 | 21300 | 1065 | 53250[a] | 13800 | 20700 | 1035 | 51750[a] | 700 | 1050 | 53 | 2650[a] |
| TOTAL | | | 6006 | 300300 | | | 3414 | 1099100 | | | 106 | 7950 |

* based on personal communication, CH2MHill
assume 1 cubic yard = 1.5 tons; assume 20 tons per truck
off-facility soil common to all alternatives

[a] assumes 25 local/urban and 25 rural highway miles for each truck trip

[b] assumes 20 local/urban and 80 rural highway miles for each truck trip

[c] assumes 50 local/urban and 550 rural highway miles for each truck trip

# REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV



34447

**EPA ID:** GA0001974880 **Site Name:** FORMER COTTON SEED OIL MILL (VACANT LOT) **State ID:**

**Alias Site Names:**

**City:** FORT VALLEY **County or Parish:** PEACH **State:** GA

**Refer to Report Dated:** 12/19/97 **Report Type:** SITE INSPECTION 001

**Report Developed by:**

**DECISION:**

- [X] **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**
  - [X] **1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)**
  - [ ] **1b. Site may qualify for action, but is deferred to:**
- [ ] **2. Further Assessment Needed Under CERCLA:**
  - **2a. Priority:** [ ] **Higher** [ ] **Lower**
  - **2b. Other: (recommended action)**

**DISCUSSION/RATIONALE:**

Based on sample data and evaluation of contamination pathways and targets, there is a low potential that human health and the environment are being adversely affected by the site.

**Site Decision Made by:** ALAN W. YARBROUGH

**Signature:** Alan W. Yarbrough **Date:** 08/26/98

**EPA Form # 9100-3**

Received 7/8/98
Alan W. Yarbrough

# SITE INVESTIGATION

## FORMER COTTON SEED OIL MILL

## FORT VALLEY, GEORGIA 31030

December 19, 1997

Prepared By:

**Georgia Department of Natural Resources**
**Environmental Protection Division**
**Hazardous Waste Management Branch**

Prepared By:
Faney L.H. Foster
Faney L.H. Foster
Environmental Engineer

Approved By:
Charles D. Williams
Derrick Williams
Program Manager I

## TABLE OF CONTENTS


**SECTION NUMBER** ..... PAGE

1.0 INTRODUCTION ..... 3

2.0 SITE DESCRIPTION, OPERATIONAL HISTORY AND WASTE CHARACTERISTICS ..... 3
- 2.1 Location ..... 3
- 2.2 Site Description ..... 3
- 2.3 Operational History and Waste Characteristics ..... 3

3.0 WASTE/SOURCE SAMPLING ..... 4
- 3.1 Sample Locations ..... 4
- 3.2 Analytical Results ..... 4
- 3.3 Conclusions ..... 4

4.0 GROUND WATER PATHWAY ..... 5
- 4.1 Hydrogeology ..... 5
- 4.2 Targets ..... 5
- 4.3 Sample Locations ..... 5
- 4.4 Analytical Results ..... 5
- 4.5 Conclusions ..... 6

5.0 SURFACE WATER PATHWAY ..... 6
- 5.1 Hydrology ..... 6
- 5.2 Targets ..... 6
- 5.3 Sample Locations ..... 6
- 5.4 Conclusions ..... 6

6.0 SOIL EXPOSURE AND AIR PATHWAYS ..... 7
- 6.1 Physical Conditions ..... 7
- 6.2 Soil and Air Targets ..... 7
- 6.3 Soil Sample Locations ..... 7
- 6.4 Soil Analytical Results ..... 8
- 6.5 Conclusions ..... 8

7.0 SUMMARY AND CONCLUSIONS ..... 8

References ..... 9

Figures ..... 10

Attachments ..... 10

## 1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Reauthorization Act of 1986 (SARA), the Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch will conduct a site investigation (SI) at the Former Cotton Seed Oil Mill in Peach County, Georgia. The purpose of this investigation was to collect information concerning conditions at the Former Cotton Seed Oil Mill sufficient to assess the threat posed to human health and the environment and to determine the need for additional investigation under CERCLA or other authority, and if appropriate, support site evaluation using the Hazard Ranking System (HRS) for proposal to the National Priorities List (NPL). The investigation included reviewing previous information, sampling waste and environmental media to evaluate and document HRS factors, and collecting additional non-sampling information.

## 2.0 SITE DESCRIPTION, OPERATIONAL HISTORY AND WASTE CHARACTERISTICS

### 2.1 Location

Former Cotton Seed Oil Mill was located on what is now a vacant lot on Camellia Boulevard (SR 49) just north of College Street and east of Miller Street in Peach County. The geographic coordinates are 32° 33' 06.5" north latitude and 083° 53' 12.7" west longitude as shown on the United States Geological Survey (U.S.G.S.) Quadrangle Topographical Map, ( Reference 1. Figure 1).

To reach the site from Atlanta, take I-75 South through Macon and exit at SR 49 (exit #46) to the right in Peach County. Fort Valley is approximately 10 miles southwest of I-75 on SR 49.

The area is characterized by a warm and humid climate with long, hot summers and short, mild winters. The average rainfall is about 48 inches per year. March and July are normally the wettest months, each averaging more than five inches of rainfall. Fall is the driest part of the year, but no month has an average of less than two inches of rainfall (Soil Survey, 1967).

### 2.2 Site Description

The site covered approximately 1 acre located on what is now a vacant city block in Fort Valley, Peach County, Georgia. The property is rectangular in shape and relatively flat. It contained a cotton seed oil mill, cotton warehouse and knitting mill. No buildings or other structures are on the property.

### 2.3 Operational History and Waste Characteristics

The cotton seed oil mill, cotton warehouse and knitting mill were operational until the late 1920's. Since that time, the vacant building was damaged by a tornado in 1975 and later torn down in 1979.

The former Cotton Seed Oil Mill is being considered for a SI because perchloroethylene(PCE) has been detected above detection limits in the Fort Valley Municipal Water Supply Wells 1 and 2 located approximately 500 feet and 600 feet from the site, respectively . Although the use of PCE has not been verified at this site, the area of this site would be an optimum hydrologic location for a release of PCE to impact both city Wells 1 and 2 as well as monitoring well MW-4T which is next to the Anthoine Machine Works. This site is within the wellhead protection area of Municipal Wells 1 and 2.

## 3.0 WASTE/SOURCE SAMPLING

### 3.1 Sample Locations

Table 1 presents sample numbers, locations, and objectives for all samples collected during the SI. Eight samples were collected to evaluate the site. The rationale for location and type of samples collected is discussed in the pathway section of this report. Figure 2 shows sample locations.

**TABLE 1: SAMPLE LOCATION**

| Sample Number | Sample Type | Location | Date | Time |
|---|---|---|---|---|
| 1a & 1b | soil | sample collected 3-3.5' deep approx. 50' from Camellia Blvd and approx. 75' from the print shop. | 10/28/97 | 1407 |
| 2a & 2b | soil | sample collected 3.5-4' deep approx. 100' from the print shop and approx. 150' from Central Avenue | 10/28/97 | 1433 |
| 3a & 3b | soil | sample collected 8' deep approx. 100' from Railroad Street and approx. 150' from Central Avenue | 10/28/97 | 1505 |
| 4a & 4b | soil | sample collected 3-5' deep approx. 30' from Railroad Street in line with Fabre Care Cleaners | 10/28/97 | 1540 |

### 3.2 Analytical Results

A trace of toluene was detected in the following samples: 1a,1b, 3a & 3b. No other contaminants were detected at the site.

### 3.3 Conclusions

Sampling results indicate no contaminants that pose a threat to human health and the environment.

## 4.0 GROUND WATER PATHWAY

### 4.1 Hydrogeology

The City of Fort Valley is located in the Fort Valley Plateau District of the Coastal Plain physiographic province. The dominant feature of the Fort Valley Plateau District is a broad, flat topped topography with fewer streams and less local relief than adjacent districts(Soil Survey, 1976).

The City of Fort Valley is located in an outcrop area of the Lower Paleocene Clayton formation which consists of sandy brick-red clay and fine to coarse grained sand. The Clayton formation is underlain by the Providence Sand, Providence-Ripley-Cusetta, Blufftown-Eutaw, and Tuscaloosa formations. The shallow most aquifer is the Clayton (or perched) aquifer which is composed 10-35 feet of silty fine sand(Reference 2,3).

The Clayton aquifer is overlain by 10-15 feet of soil and a sandy clay unit, and underlain by an aerially extensive kaolin layer which ranges in thickness from 2-20 feet. Ground water in the Clayton aquifer is under water table conditions, and depth to ground water in this aquifer is approximately 25-30 feet below land surface(Reference 3).

The deepest aquifer in Fort Valley is the Tuscaloosa aquifer. It occurs at a depth of about 250 feet below land surface and is overlain by the Ripley/Blufftown - Eutaw semiconfining unit. Ground water in the Tuscaloosa aquifer occurs under confined conditions. The Tuscaloosa aquifer is the primary source of ground water to the high capacity wells in the area including Fort Valley City wells 1, 2 and 5(Reference 2,3).

### 4.2 Targets

Most people within 4 miles of the Former Cotton Seed Oil Mill obtain drinking water from a municipal well system operated by the City of Fort Valley Water System. Approximately 1113 residents use private wells for drinking water(Reference 4). The nearest municipal well is approximately 500 feet from the site.

The City of Fort Valley, Peach County currently has a wellhead protection permit, #2250001, with an expiration date of July 27, 2001.

### 4.3 Sample Locations

No groundwater samples were taken to support this SI. Groundwater samples from Well 1, 2 and MW-2a have been analyzed at the EPD laboratory.

### 4.4 Analytical Results

EPD laboratory detected 1.11 ppb and 5.40 ppb PCE in Well 1 and Well 2, respectively on 10/8/96

and 0.53-0.55 ppb tetrachloroethene in MW -2a(see figure 5) on 10/16/97.

### 4.5 Conclusions

PCE has been detected above detection limits in the Fort Valley Municipal Water Supply Wells 1 and 2. Although the site is in an optimum hydrologic location for a release of PCE, there are no historical site activities which could contribute to this contamination.

## 5.0 SURFACE WATER PATHWAY

### 5.1 Hydrology

The site is located on a topographic plateau (Ref. 1). The former cotton seed oil mill business was located inside four paved streets. Overland drainage from the site, during extremely wet periods, flows across the open lot approximately 150 feet into the stormwater line (Fig. 3, Ref. 12). The stormwater line goes 1.4 miles northeast underneath the City of Fort Valley(Reference 7) and then discharges to Bay Creek, the surface water pathway probable point of entry (PPE). Bay Creek, with a flow rate less than 10 cubic feet per second, flows in a generally east-southeasterly direction approximately 11.9 miles before merging with Big Indian Creek. Big Indian Creek is a moderate size stream with an average flow rate of 86 cubic feet per second and an average low flow rate of 21 cubic feet per second (Ref. 5). There has been no Flood Insurance Administration Map produced for the Fort Valley area. However, a Flood Hazard Rate Map has been produced for the area. The Flood Hazard Rate Map shows the site to be outside the 500-year floodplain (Ref. 6).

### 5.2 Targets

There are no drinking water intakes within 15 downstream miles (Fig. 4). It is likely some recreational fishing (brim and bass) occurs in the area where Bay Creek merges into Big Indian Creek. There is limited access to this area by the public; therefore, only the people whom own properties along the creeks have the opportunity to catch fish (Ref. 11). The distance between the former cotton seed oil mill and the fishery is approximately 13 miles. There are 8 miles of stream frontage wetlands located within 15 downstream miles of the site. The nearest wetland (approximately 50 acres, 0.5 mile frontage) is approximately 2.0 miles downstream from the site on Bay Creek (Ref. 8)

### 5.3 Sample Locations

No surface water samples were taken to identify a release to Bay Creek and Big Indian Creek. Probable point of entry (PPE) were chosen for Bay Creek and Big Indian Creek based on the surface runoff, topography of the area and the stormwater line discharge.

### 5.4 Conclusions

A potential release of contaminants to surface water is not suspected because of the distance to the PPE. No drinking water intakes have been identified but sensitive environments (wetlands and fishery) have been identified. The surface water pathway is not of concern.

## 6.0 SOIL EXPOSURE AND AIR PATHWAYS

### 6.1 Physical Conditions

The site was used in the past as a cotton seed oil mill, cotton warehouse and knitting mill until the late 1920's. Since that time the vacant building was damaged by a tornado in 1975 and later torn down in 1979. The site, a vacant lot, is vegetated by grass and weeds(Reference 13).

### 6.2 Soil and Air Targets

There are no employees at the Former Cotton Seed Oil Mill. There are no residences, schools or day care facilities within 200 feet. Sixteen residences are within 0.25 mile of the site. Table 2 list the estimated population within 4 miles of the site (Reference 4).

**TABLE 2**
POPULATIONS FOR TARGET DISTANCES

| DISTANCE | POPULATION |
|---|---|
| 0 - ¼ mile | 52 |
| ¼ - ½ mile | 112 |
| ½ - 1 mile | 658 |
| 1 - 2 mile | 2232 |
| 2 - 3 mile | 3330 |
| 3 - 4 mile | 3372 |

Pursuant to the Georgia Endangered Wildlife Act of 1973 and the Federal Endangered Species Act of 1973, no wildlife is designated as a state and federally protected species (classified as endangered wildlife) whose range of habitats includes Peach and Houston Counties (Ref. 9).

Pursuant to the Georgia Wildlife Preservation Act of 1973, Chamaecyparis thyoides (Linnaeus) Atlantic White Cedar, Nestronia umbellula (Rafinesque) Indian Olive, Sarracenia rubra (Walter) Sweet Pitcher plant and Trillium reliquum (Freeman) Relict Toadshade are designated as state protected species (classified threatened/endangered plants) whose range of habitat include Peach, Houston, Taylor, Talbot, Marion, Crawford, Muscogee, Macon and Schley Counties (Ref. 10).

The above protected flora and fauna were not designated as terrestrial sensitive environments for the soil or air pathways due to the fact that none of the protected species were observed on-site or off-site during the reconnaissance.

### 6.3 Soil Sample Locations

Eight samples were collected to investigate the soil exposure pathway. All samples were collected

between 3.0 to 8.0 feet. Table 1 presents sample numbers, descriptions, and objectives. Figure 2 shows soil sample locations.

### 6.4 Soil Analytical Results

A trace of toluene was detected in sample # 1a,1b, 3a & 3b. No other contaminants were detected at the site.

### 6.5 Conclusions

Sample results indicate that soil pathway is not considered to be a concern. The air pathway is not considered a concern due to no odor or evidence of a release(Reference 13).

## 7.0 SUMMARY AND CONCLUSIONS

Environmental samples were collected and analyzed to determined the source of perchloroethylene in Fort Valley Municipal Well 1 and 2 and the potential migration pathways. In addition, information was collected to confirm target populations and environments potentially at risk from the site.

Based on sample data and evaluation of contaminant pathways and targets, there is a low potential that human health and the environment are being adversely affected by the site.

## REFERENCES


1. U. S. Geologic Survey 7.5 Minute Series Topographic Maps: Fort Valley West Quadrangle, 1973 (photo revised 1985); Fort Valley East Quadrangle, 1973 (photo revised 1985); Perry West Quadrangle, 1972 (photo revised 1984); Marshallville Quadrangle, 1972.

2. Draft Remedial Investigation Report, Woolfolk Chemical Works Site-Fort Valley, Georgia, CH2M Hill, July 1992

3. Work Plan for Investigating the Relation Between PCE Found in Fort Valley Water Supply Wells and the Woolfolk Chemical Works Superfund Site, March 17, 1997.

4. CENTRACTS data, Frost Associates, Essex, Ct, September 16,1997.

5. McFarlene, Roger, U.S. Geological Survey, Phone Call (770) 903-9100, 11 December 1997.

6. U.S. Department of Housing and Urban Development, Flood Hazard Rate Map of Peach County, Georgia, 25 June 1976.

7. Lanter, Walter, City of Fort Valley Utility Commission, Phone Call (912) 825-7701, 10 December 1997.

8. U.S. Department of the Interior, Fish and Wildlife Service, National Inventory Maps of Georgia, Fort Valley West 1995; Fort Valley East 1995; Marshallville 1988; Perry West 1988; and Perry East 1988; scale: 1:24,000.

9. Odom, Ron R., Georgia's Protected Wildlife, Georgia Department of Natural Resources, Game and Fish Division, Endangered Wildlife Program, 15 September 1977.

10. Patrick, Thomas S., Protected Plants of Georgia, Georgia Department of Natural Resources, Wildlife Resources Division, Georgia Natural Heritage Program, 1995.

11. Schleger, Steve, Georgia Department of Natural Resources, Wildlife Resources Division, Fort Valley, Phone Call (912) 825-6151, 12 December 1997.

12. Little, Robert, City of Fort Valley City Hall, Phone Call (912) 825-8261, 15 December 1997.

13. Site Reconnaissance, Former Cotton Seed Oil Mill, Fort Valley, Georgia, conducted by Faney Foster, Georgia Environmental Pdrotection Division, August 28, 1997.

## FIGURES

1. Site Location Map: U.S. Geologic Survey 7.5 Minute Topographic Map of Georgia

2. Site Layout and Sample Locations

3. Storm water Line Map

4. 15 Mile Surface Water Downstream Pathway

5. Geologic Suvey Drilling Locations

## ATTACHMENTS

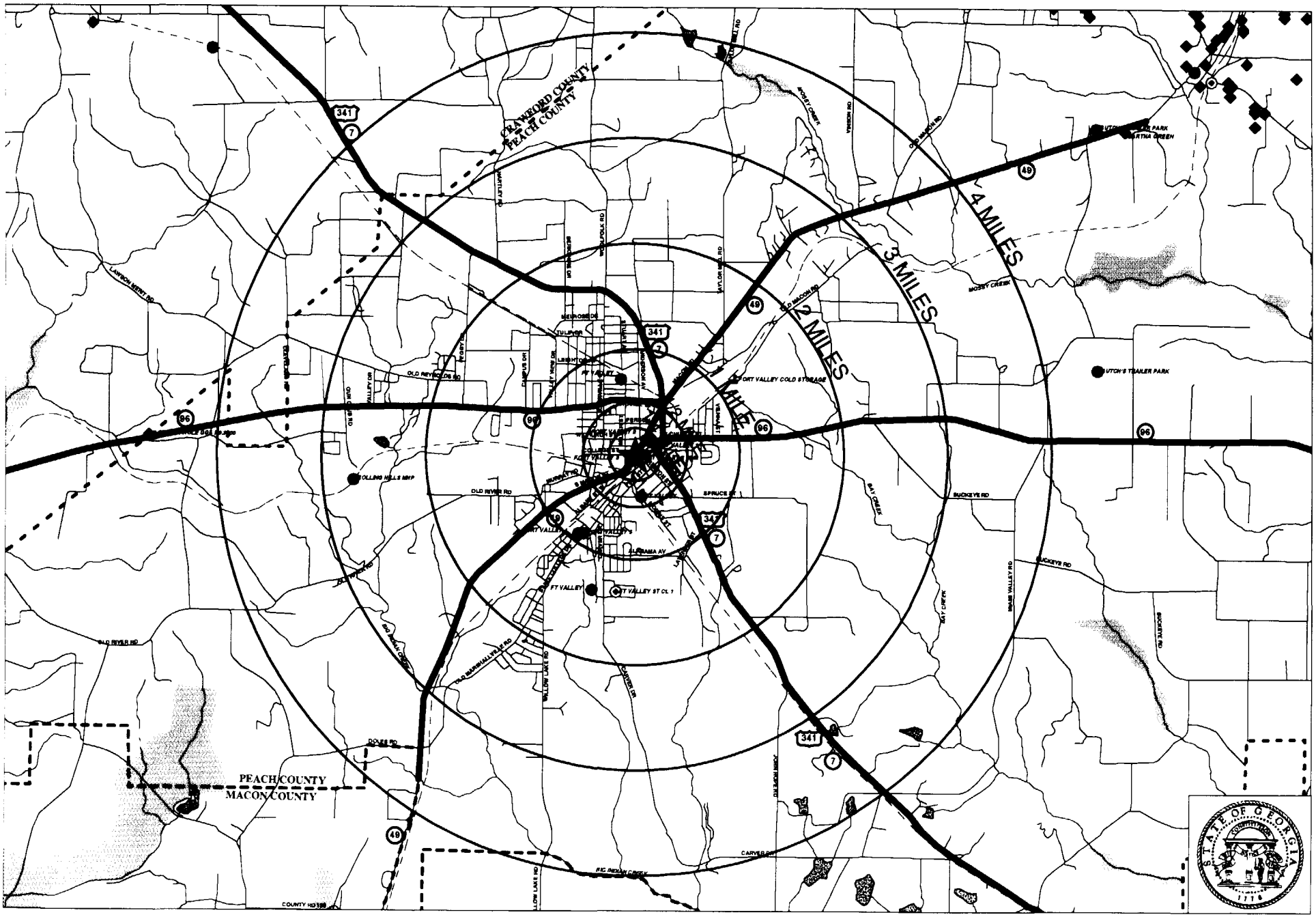
Attachment A - Geologic Survey Topographic May

Attachment B - Chain of Custody Form

Attachment C - Laboratory Sample Results

Attachment D - Centracts Data

Attachment E - Site Inspection Sampling and Analysis Plan




9/17/97

Fig 1

- Site Location
- Public Supply Well
- Surface Water Intake
- Domestic Well
- Unused Well
- Spring
- Industrial Well
- Commercial Well
- Irrigation Well
- Livestock well
- Well - Unknown use
- Other Well
- County Boundary
- Road
- Major Highway
- Stream/River
- Railroad
- Wetland

# COLLEGE STREET AND STATE HIGHWAY 47 SITE
# FORT VALLEY, PEACH COUNTY

**1/4, 1/2, 1, 2, 3 and 4 MILE RADII Well Locations**

**SOURCES: Georgia Public Water Source Inventory, 1994; US Census Bureau 1990; Ga. Water Source Inv., USGS, 1995**

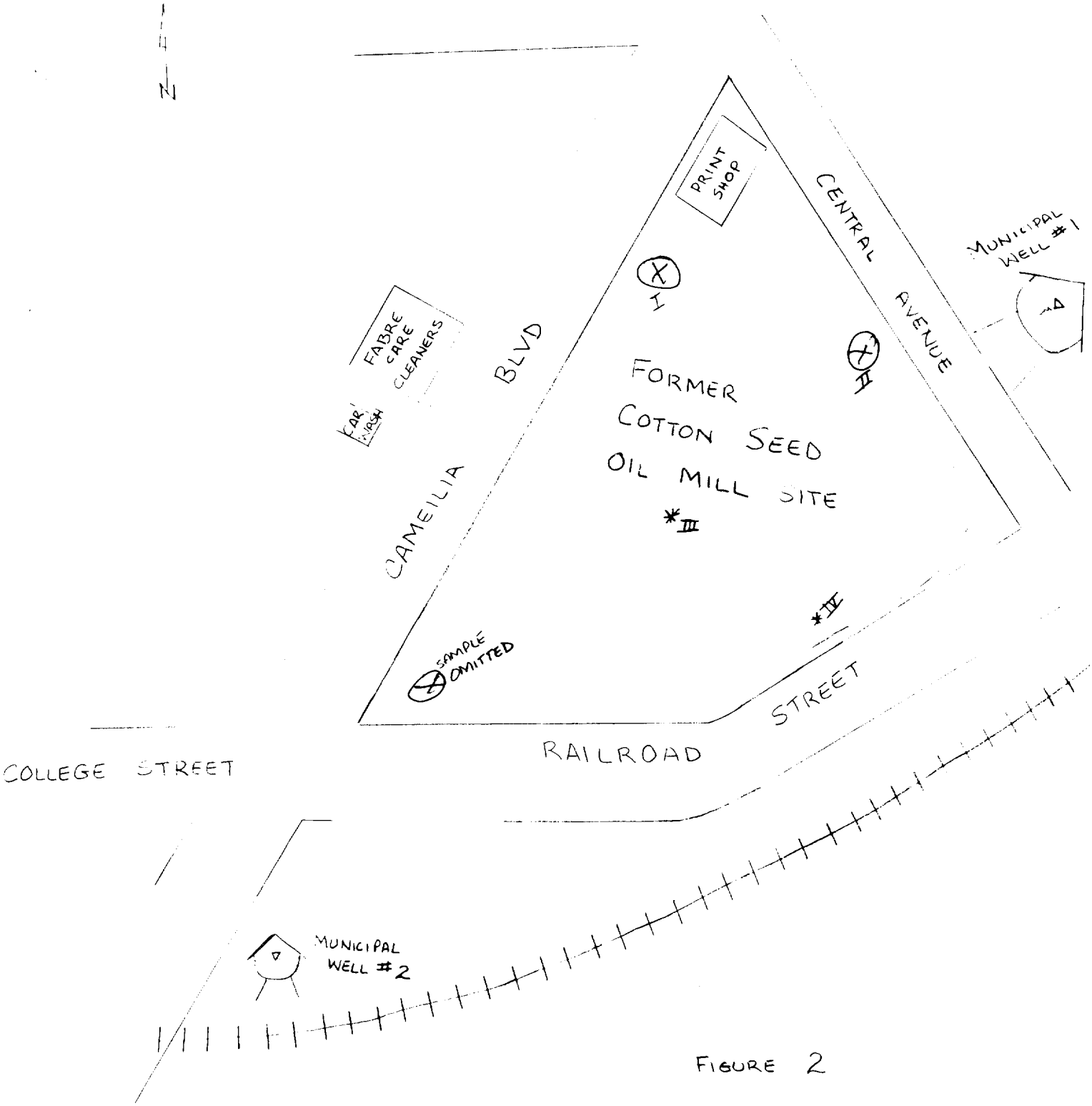



FIGURE 2

NOT TO SCALE

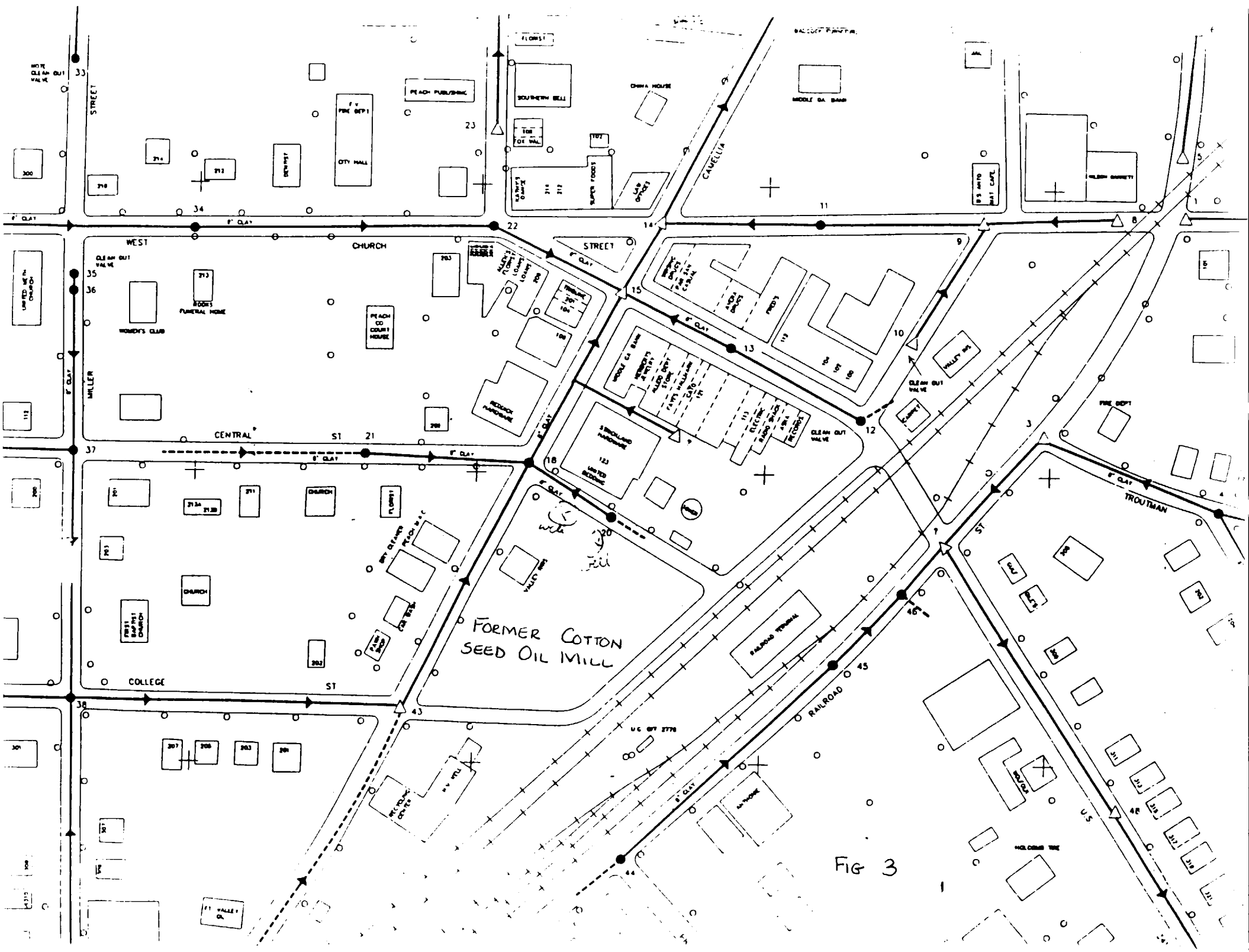
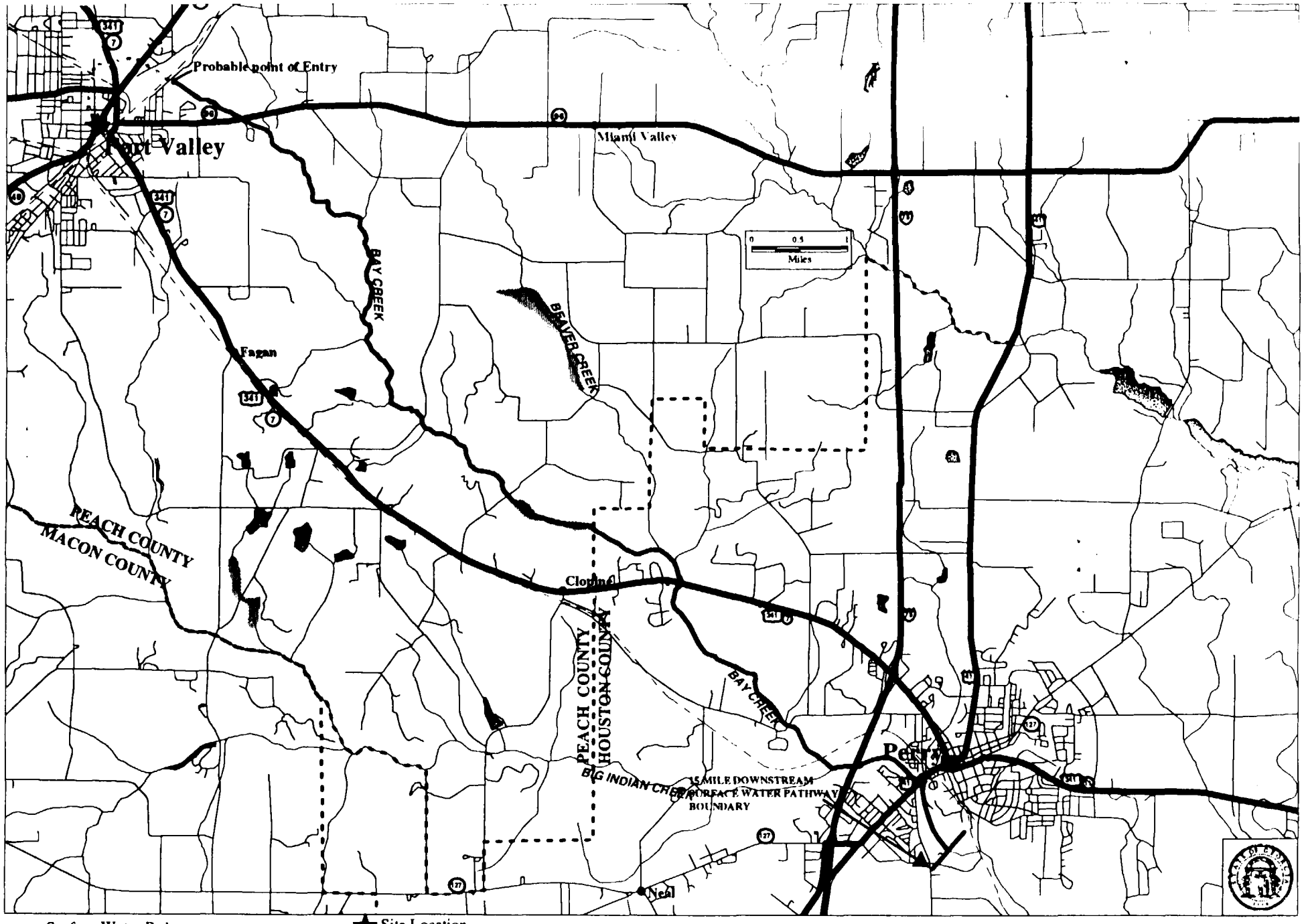

WEST
CHURCH
STREET
CENTRAL
ST
MILLER
STREET
CAMELLIA
TROUTMAN
ST
COLLEGE
ST
RAILROAD
U.S.
PEACH PUBLISHING
CITY HALL
FIRE DEPT
SOUTHERN BELL
CHINA HOUSE
MIDDLE GA BANK
SUPER FOODS
PEACH CO COURT HOUSE
WOMEN'S CLUB
FIRST BAPTIST CHURCH
FORMER COTTON SEED OIL MILL
RAILROAD TERMINAL
VALLEY INN
CLEAN OUT VALVE

FIG 3




Surface Water Pathway
Hydrology
County Boundary
Projected Surface Pathway
Major Highway
Major Wetland

Site Location
City/Town
Unincorporated Town

FORT VALLEY, PEACH COUNTY
15 MILE SURFACE WATER DOWNSTREAM PATHWAY
FIG 4

Source: 1990 Census Bureau (TIGER), US EPA (GIRAS LANDUSE), GA DOT (Wetlands)

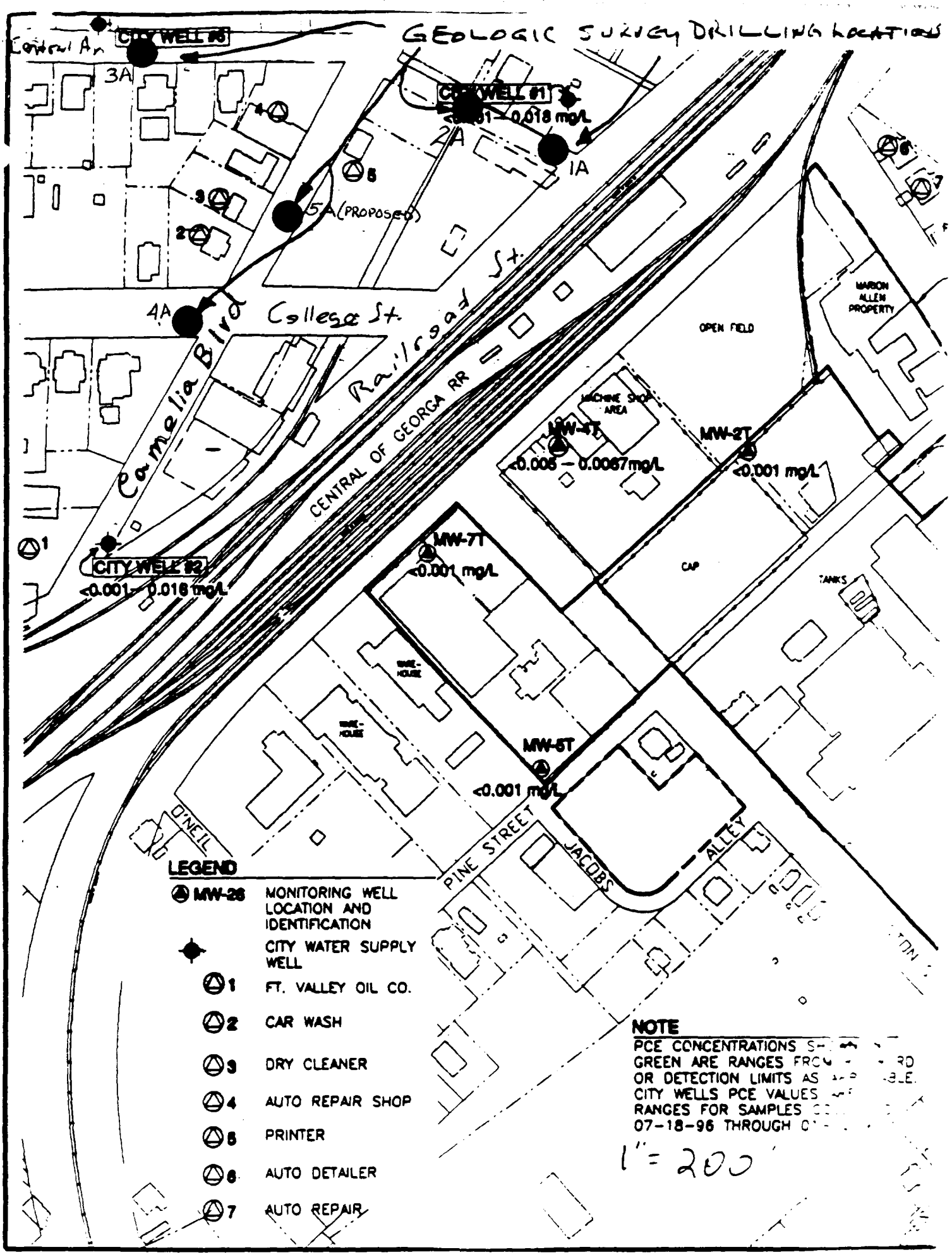

GEOLOGIC SURVEY DRILLING LOCATIONS
CITY WELL #6
3A
CITY WELL #1
<0.001 – 0.018 mg/L
2A
1A
5A (PROPOSED)
4A
College St.
Railroad St.
Camelia Blvd
CENTRAL OF GEORGA RR
CITY WELL #2
<0.001 – 0.018 mg/L
MARION ALLEN PROPERTY
OPEN FIELD
MACHINE SHOP AREA
MW-4T
<0.005 – 0.0067 mg/L
MW-2T
<0.001 mg/L
MW-7T
<0.001 mg/L
CAP
TANKS
MW-6T
<0.001 mg/L
O'NEIL
PINE STREET
JACOBS
ALLEY
LEGEND
MW-26 MONITORING WELL LOCATION AND IDENTIFICATION
CITY WATER SUPPLY WELL
1 FT. VALLEY OIL CO.
2 CAR WASH
3 DRY CLEANER
4 AUTO REPAIR SHOP
5 PRINTER
6 AUTO DETAILER
7 AUTO REPAIR
NOTE
PCE CONCENTRATIONS
GREEN ARE RANGES FRO
OR DETECTION LIMITS AS
CITY WELLS PCE VALUES
RANGES FOR SAMPLES
07-18-96 THROUGH
1" = 200'

FIG 5

ATTACHMENT "A"

# OVERSIZED

# DOCUMENT

ATTACHMENT "B"

**GEORGIA ENVIRONMENTAL PROTECTION DIVISION**
**HAZARDOUS WASTE MANAGEMENT BRANCH**

**CHAIN OF CUSTODY**

**FACILITY:** FORMER COTTON SEED OIL MILL **LOCATION:** FORT VALLEY

| SAMPLE # | HWMB LOG # | LAB # | DESCRIPTION | COLLECTED BY (NAME) | DATE | TIME |
|---|---|---|---|---|---|---|
| 1A | 7350 | | SUBSURFACE SOIL @ FRONT ON PROPERTY ACROSS FROM ~~CE~~ CLEANERS | FANEY F | 10/28/97 | 2:07P |
| 1B | 7351 | | DUPLICATE OF 1A | | | |
| 2A | 7352 | | SUBSURFACE SOIL BEHIND PRINT SHOP @ CENTRAL | FANEY F | 10/29/97 | 2:33P |
| 2B | 7353 | | DUPLICATE OF 2A | | | |
| 3A | 7354 | | SUBSURFACE SOIL IN FRONT OF WATER TOWER | FANEY F | 10/28/97 | 3:05P |
| 3B | 7355 | | DUPLICATE OF 3A | | | |
| 4A | 7356 | | SUBSURFACE SOIL IN FRONT OF CLEANERS ALONG RAILROAD ST | FANEY F | 10/28/97 | 3:40P |
| 4B | 7357 | | DUPLICATE OF ~~4~~ 4A | | | |

**TRANSFER RECORD**

| TRANSFERRED BY (NAME) | TO (NAME) (IF FINAL: LAB NAME) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (NAME) | DATE |
|---|---|---|---|---|---|---|
| FANEY FOSTER | MARY LOU WYNN | 10-29-97 | 7:47AM | | Mary Louise Wynn | 10-29-97 |
| Mary Louise Wynn | | | | Hand | Gwen Hufstedler | 10-29-97 |
| | | | | | | |

**ANALYSIS REQUESTED:** PCE/VOLATILES

R:/Mitchell
Former. Custody. FRM

ATTACHMENT "C"

GHL

# REQUEST FOR LABORATORY ANALYSIS

Facility Name/Location: FORT VALLEY/FORMER COTTON SEED OIL MILL

Sample Collected By/Phone: FANEY FOSTER/ [illegible]7524

Collection Date: OCT 28, 1997

Date Submitted To Lab: OCT 29, 1997

HWMB LOG NUMBER: 7350

*(File a separate Request Sheet for each sample point)*

AB84335 Due date: 11/25/97
Date submitted: 10/29/97
sourceID: ADHOC FORT VALLEY FORMER COTT HW7350
Sample collector: F FOSTER
Georgia Dept. of Natural Resources

Analysis Needed By: Routine X Other (specify):

Sample Description (check one)

Waste ___ Soil/Sediment X 2-6 Sludge ___

Ground Water ___ Surface Water ___ Drinking Water Well ___

Concentration of Organics Requested (estimated): High ___ Low ___ Other (e.g., rinse blank - specify) ___

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ___

Special Precautions: ___

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

Semi-Volatiles (Acid & Base/Neutral) ___

Volatiles ___

Pesticides ___

Herbicides ___

Organophosphorous Pesticides ___

PCB ___

BETX ___

Total Petroleum Hydrocarbon ___

Organics Special Request: PERCHLOROETHYLENE

4 OZ JARS
8 OZ JARS
16 OZ JARS

### 2. TOTAL METALS

ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ___

Mercury ___

Metals Special Request: ___

### 3. TCLP ORGANICS

Volatiles ___ Pesticides ___

Semi-Volatiles (Acid & Base/Neutral) ___ Herbicides ___

Additional Specific Organics For TCLP: ___

### 4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ___ Additional Metals For TCLP: ___

Mercury ___

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ___

Reviewed By (HWMB): [signature] Date: 10/14 Received By (EPD Lab): [signature]

Approved By (HWMB): ___ Date: ___ Date (EPD Lab): 10-29-97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | F FOSTER | **Sample ID :** | **AB84335** |
| **Date Received:** | 10/29/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 12:49 | **Time Collected:** | 14:07 |
| **Reporting Date:** | 11/14/97 | **DNR Lab Reference:** | HW7350 |
| **Sample Site:** | FORT VALLEY FORMER COTT HW7350 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |



AMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Acetone | 75059 | 8260 | 100 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 43.7 | | ug/kg | JDA | 11/03/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 58.2 | | ug/kg | JDA | 11/03/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |

**Sample ID : AB84335**



AMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | .-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | JDA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 49.4 | | ug/kg | JDA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | JDA | 11/03/97 |

**Sample comments :**

*End of Report*



AMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

GHL

# REQUEST FOR LABORATORY ANALYSIS

**Facility Name/Location:** FORT VALLEY/FORMER COTTON SEED OIL MILL

**Sample Collected By/Phone:** FANEY FOSTER / 651-7524

**Collection Date:** OCT 28, 1997

**Date Submitted To Lab:** OCT 29, 1997

**HWMB LOG NUMBER:** 7351

*(File a separate Request Sheet for each sample point)*

AB84336 Due date: 11/25/97
Date submitted: 10/29/97
sourceID: ADHOC FORT VALLEY FORMER COTT HW7351
Sample collector: F FOSTER

**Analysis Needed By:** Routine X Other (specify

**Sample Description** (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | X 2-6 | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

Concentration of Organics Requested (estimated): High ___ Low ___ Other (e.g., rinse blank - specify) ___

**Describe Sample Including Source And Known Properties** (e.g., pH, concentration):

**Applicable Hazardous Waste Codes** (if known) ___ ___ ___

**Special Precautions:** ___

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ |
| Volatiles | ___ |
| Pesticides | ___ |
| Herbicides | ___ |
| Organophosphorous Pesticides | ___ |
| PCB | ___ |
| BETX | ___ |
| Total Petroleum Hydrocarbon | ___ |

I 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

**Organics Special Request:** PERCHLOROETHYLENE

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

**Additional Specific Organics For TCLP:** ___

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ___

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | [signature] | Date: | 10/14 | Received By (EPD Lab): | [signature] |
| Approved By (HWMB): | ___ | Date: | ___ | Date (EPD Lab): | 10-29-97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | F FOSTER | **Sample ID :** | **AB84336** |
| **Date Received:** | 10/29/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 12:49 | **Time Collected:** | 14:07 |
| **Reporting Date:** | 11/14/97 | **DNR Lab Reference:** | HW7351 |
| **Sample Site:** | FORT VALLEY FORMER COTT HW7351 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |



AMETER CODE: EPA
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mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Acetone | 75059 | 8260 | 100 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 37.1 | | ug/kg | JDA | 11/03/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 56.2 | | ug/kg | JDA | 11/03/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |

**Sample ID : AB84336**



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | -Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | JDA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.4 | | ug/kg | JDA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | JDA | 11/03/97 |

**Sample comments :**

*End of Report*



AMETER CODE: EPA
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

GHL

# REQUEST FOR LABORATORY ANALYSIS

**Facility Name/Location:** FORT VALLEY/FORMER COTTON SEED OIL MILL

**Sample Collected By/Phone:** FANEY FOSTER / 651-7524

**Collection Date:** OCT 28, 1997

**Date Submitted To Lab:** OCT 29, 1997

**HWMB LOG NUMBER:** 7352

*(File a separate Request Sheet for each sample point)*

AB84337 Due date: 11/25/97
Date submitted: 10/29/97
sourceID: ADHOC FORT VALLEY FORMER COTT HW7352
Sample collector: F FOSTER

**Analysis Needed By:** Routine X Other (specify):

**Sample Description** (check one)

Waste ___ Soil/Sediment X 2-6 Sludge ___

Ground Water ___ Surface Water ___ Drinking Water Well ___

Concentration of Organics Requested (estimated): High ___ Low ___ Other (e.g., rinse blank - specify) ___

**Describe Sample Including Source And Known Properties** (e.g., pH, concentration):

**Applicable Hazardous Waste Codes** (if known) ___

**Special Precautions:** ___

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

Semi-Volatiles (Acid & Base/Neutral) ___

Volatiles ___

Pesticides ___

Herbicides ___

Organophosphorous Pesticides ___

PCB ___

BETX ___

Total Petroleum Hydrocarbon ___

Organics Special Request: PERCHLOROETHYLENE

I 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

### 2. TOTAL METALS

ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ___

Mercury ___

Metals Special Request: ___

### 3. TCLP ORGANICS

Volatiles ___ Pesticides ___

Semi-Volatiles (Acid & Base/Neutral) ___ Herbicides ___

Additional Specific Organics For TCLP: ___

### 4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ___ Additional Metals For TCLP: ___

Mercury ___

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ___

Reviewed By (HWMB): [signature] Date: 10/14 Received By (EPD Lab): [signature]

Approved By (HWMB): ___ Date: ___ Date (EPD Lab): 10-29-97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | F FOSTER | **Sample ID :** | **AB84337** |
| **Date Received:** | 10/29/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 12:49 | **Time Collected:** | 14:33 |
| **Reporting Date:** | 11/14/97 | **DNR Lab Reference:** | HW7352 |
| **Sample Site:** | FORT VALLEY FORMER COTT HW7352 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: *Tentatively identified/Estmated value*
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 42.8 | | ug/kg | JDA | 11/03/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 54.6 | | ug/kg | JDA | 11/03/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |

**Sample ID : AB84337**



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 49.1 | | ug/kg | JDA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | JDA | 11/03/97 |

**Sample comments :**

*End of Report*



AMETER CODE: EPA
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MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# REQUEST FOR LABORATORY ANALYSIS

GHL

Facility Name/Location: FORT VALLEY/FORMER COTTON SEED OIL MILL

Sample Collected By/Phone: FANEY FOSTER / 651-7524

Collection Date: OCT 28, 19

Date Submitted To Lab: OCT 29, 19

HWMB LOG NUMBER: 7353

*(File a separate Reqest Sheet for each sample point)*

AB84338 Due date: 11/25/97
Date submitted: 10/29/97
sourceID: ADHOC FORT VALLEY FORMER COTT HW7353
Sample collector: F FOSTER

Analysis Needed By: Routine X Other

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | X 2-6 | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

Concentration of Organics Requested (estimated): High ___ Low ___ Other (e.g., rinse blank - specify) ___

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ___ ___ ___

Special Precautions: ___

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ |
| Volatiles | ___ |
| Pesticides | ___ |
| Herbicides | ___ |
| Organophosphorous Pesticides | ___ |
| PCB | ___ |
| BETX | ___ |
| Total Petroleum Hydrocarbon | ___ |

Organics Special Request: PERCHLOROETHYLENE

L 4 OZ JARS
___ 8 OZ JARS
___ 16 OZ JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

Additional Specific Organics For TCLP: ___

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ___

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | [signature] | Date: | 10/14 | Received By (EPD Lab): | GHL |
| Approved By (HWMB): | ___ | Date: | ___ | Date (EPD Lab): | 10-29-97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | F FOSTER | **Sample ID :** | **AB84338** |
| **Date Received:** | 10/29/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 12:49 | **Time Collected:** | 14:33 |
| **Reporting Date:** | 11/14/97 | **DNR Lab Reference:** | HW7353 |
| **Sample Site:** | FORT VALLEY FORMER COTT HW7353 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |



AMETER CODE: EPA
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Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Acetone | 75059 | 8260 | 100 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 44.1 | | ug/kg | JDA | 11/03/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 54.4 | | ug/kg | JDA | 11/03/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |

**Sample ID : AB84338**



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 49.6 | | ug/kg | JDA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/03/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not Detected | | ug/kg | JDA | 11/03/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | JDA | 11/03/97 |

**Sample comments :**

*End of Report*



AMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# REQUEST FOR LABORATORY ANALYSIS

**Facility Name/Location:** FORT VALLEY/FORMER COTTON SEED OIL MILL

**Sample Collected By/Phone:** FANEY FOSTER / 651-7524

**Collection Date:** OCT 28, 1997

**Date Submitted To Lab:** OCT 29, 1997

**HWMB LOG NUMBER:** 7354

*(File a separate Request Sheet for each sample point)*

AB84339 Due date: 11/25/97
Date submitted: 10/29/97
sourceID: ADHOC FORT VALLEY FORMER COTT HW7354
Sample collector: F FOSTER

**Analysis Needed By:** Routine X Other (specif

**Sample Description** (check one)

Georgia Dept. of Natural Resources

| | | | | | |
|---|---|---|---|---|---|
| Waste | ____ | Soil/Sediment | X 2-6 | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

**Concentration of Organics Requested (estimated):** High ____ Low ____ Other (e.g., rinse blank - specify) ____

**Describe Sample Including Source And Known Properties** (e.g., pH, concentration):

**Applicable Hazardous Waste Codes** (if known) ____ ____ ____

**Special Precautions:** ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ____ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

I 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

**Organics Special Request:** PERCHLOROETHYLENE

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

**Additional Specific Organics For TCLP:** ____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ____

**Reviewed By (HWMB):** [signature] **Date:** 10/14 **Received By (EPD Lab):** [signature]

**Approved By (HWMB):** ____ **Date:** ____ **Date (EPD Lab):** 10-29-97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | F FOSTER | **Sample ID :** | **AB84339** |
| **Date Received:** | 10/29/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 12:49 | **Time Collected:** | 15:05 |
| **Reporting Date:** | 11/14/97 | **DNR Lab Reference:** | HW7354 |
| **Sample Site:** | FORT VALLEY FORMER COTT HW7354 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | Acetone | 75059 | 8260 | 100 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 46.7 | | ug/kg | JDA | 11/04/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/04/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 54.9 | | ug/kg | JDA | 11/04/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | - Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | JDA | 11/04/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 53.7 | | ug/kg | JDA | 11/04/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | JDA | 11/04/97 |

**Sample comments :**

*End of Report*



AMETER CODE: EPA
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MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

GHL

HAZARDOUS WASTE MANAGEMENT BRANCH

# REQUEST FOR LABORATORY ANALYSIS

Facility Name/Location: FORT VALLEY/FORMER COTTON SEED OIL MILL

Sample Collected By/Phone: FANEY FOSTER / 651-7524

Collection Date: OCT 28, 1997

Date Submitted To Lab: OCT 29, 1997

HWMB LOG NUMBER: 7355

*(File a separate Request Sheet for each sample point)*

AB84340 Due date: 11/25/97
Date submitted: 10/29/97
sourceID: ADHOC FORT VALLEY FORMER COTT HW7355
Sample collector: F FOSTER

Analysis Needed By: Routine X Other (specif

Sample Description (check one)

Georgia Dept. of Natural Resources

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | X 2-6 | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

Concentration of Organics Requested (estimated): High ___ Low ___ Other (e.g., rinse blank - specify) ___

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ___ ___ ___

Special Precautions: ___

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ |
| Volatiles | ___ |
| Pesticides | ___ |
| Herbicides | ___ |
| Organophosphorous Pesticides | ___ |
| PCB | ___ |
| BETX | ___ |
| Total Petroleum Hydrocarbon | ___ |

1 4 OZ. JARS
___ 8 OZ. JARS
___ 16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

Organics Special Request: PERCHLOROETHYLENE

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

Additional Specific Organics For TCLP: ___

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ___

Reviewed By (HWMB): [signature] Date: 10/14 Received By (EPD Lab): AHL

Approved By (HWMB): ___ Date: ___ Date (EPD Lab): 10-29-97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | F FOSTER | **Sample ID :** | **AB84340** |
| **Date Received:** | 10/29/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 12:49 | **Time Collected:** | 15:05 |
| **Reporting Date:** | 11/14/97 | **DNR Lab Reference:** | HW7355 |
| **Sample Site:** | FORT VALLEY FORMER COTT HW7355 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |



AMETER CODE: EPA
. . . : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
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LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | ,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | Acetone | 75059 | 8260 | 100 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 46.2 | | ug/kg | JDA | 11/04/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/04/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 51.6 | | ug/kg | JDA | 11/04/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |

**Sample ID : AB84340**



'AMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | JDA | 11/04/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 52.3 | | ug/kg | JDA | 11/04/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/04/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not Detected | | ug/kg | JDA | 11/04/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | JDA | 11/04/97 |

**Sample comments :**

*End of Report*



'AMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
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| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

GH

# REQUEST FOR LABORATORY ANALYSIS

**Facility Name/Location:** FORT VALLEY/FORMER COTTON SEED OIL MILL

**Sample Collected By/Phone:** FANEY FOSTER / 651-7524

**Collection Date:** OCT 28, 1997

**Date Submitted To Lab:** OCT 29, 1997

**HWMB LOG NUMBER:** 7356

*(File a separate Request Sheet for each sample point)*

AB84341 Due date: 11/25/97
Date submitted: 10/29/97
sourceID: ADHOC FORT VALLEY FORMER COTT HW7356
Sample collector: F FOSTER

**Analysis Needed By:** Routine X Other (speci

**Sample Description** (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | X 2-6 | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

Concentration of Organics Requested (estimated): High ___ Low ___ Other (e.g., rinse blank - specify) ___

**Describe Sample Including Source And Known Properties** (e.g., pH, concentration):

**Applicable Hazardous Waste Codes** (if known) ___ ___ ___

**Special Precautions:** ___

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ |
| Volatiles | ___ |
| Pesticides | ___ |
| Herbicides | ___ |
| Organophosphorous Pesticides | ___ |
| PCB | ___ |
| BETX | ___ |
| Total Petroleum Hydrocarbon | ___ |

I 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

**Organics Special Request:** PERCHLOROETHYLENE

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

**Additional Specific Organics For TCLP:** ___

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ___

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | [illegible] | Date: | 10/14 | Received By (EPD Lab): | [illegible] |
| Approved By (HWMB): | ___ | Date: | ___ | Date (EPD Lab): | 10-29-97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | F FOSTER | **Sample ID :** | **AB84341** |
| **Date Received:** | 10/29/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 12:49 | **Time Collected:** | 15:40 |
| **Reporting Date:** | 11/14/97 | **DNR Lab Reference:** | HW7356 |
| **Sample Site:** | FORT VALLEY FORMER COTT HW7356 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | Acetone | 75059 | 8260 | 100 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 44.6 | | ug/kg | JDA | 11/05/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/05/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 54.1 | | ug/kg | JDA | 11/05/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |

**Sample ID : AB84341**



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 51.3 | | ug/kg | JDA | 11/05/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | JDA | 11/05/97 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

HAZARDOUS WASTE MANAGEMENT BRANCH

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY/FORMER COTTON SEED OIL MILL

**Sample Collected By/Phone:** FANEY FOSTER / 651-7524

**Collection Date:** OCT 28, 1997

**Date Submitted To Lab:** OCT 29, 1997

**HWMB LOG NUMBER:** 7357

*(File a separate Request Sheet for each sample point)*

AB84342 Due date: 11/25/97
Date submitted: 10/29/97
sourceID: ADHOC FORT VALLEY FORMER COTT HW7357
Sample collector: F FOSTER

Georgia Dept. of Natural Resources

**Analysis Needed By:** Routine X Other (specify)

**Sample Description** (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | X 2-6 | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

**Conncentration of Organics Requested (estimated):** High ___ Low ___ Other (e.g., rinse blank - specify) ___

**Describe Sample Including Source And Known Properties** (e.g., pH, concentration):

**Applicable Hazardous Waste Codes** (if known) ___ ___ ___

**Special Precautions:** ___

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

| | | |
|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ | 4 OZ. JARS |
| Volatiles | ___ | 8 OZ. JARS |
| Pesticides | ___ | 16 OZ. JARS |
| Herbicides | ___ | |
| Organophosphorous Pesticides | ___ | |
| PCB | ___ | |
| BETX | ___ | |
| Total Petroleum Hydrocarbon | ___ | |

**Organics Special Request:** PERCHLOROETHYLENE

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

**Additional Specific Organics For TCLP:** ___

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ___

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | [signature] | Date: | 10/14 | Received By (EPD Lab): | [signature] |
| Approved By (HWMB): | ___ | Date: | ___ | Date (EPD Lab): | 10-29-97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | F FOSTER | **Sample ID :** | **AB84342** |
| **Date Received:** | 10/29/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 12:49 | **Time Collected:** | 15:40 |
| **Reporting Date:** | 11/14/97 | **DNR Lab Reference:** | HW7357 |
| **Sample Site:** | FORT VALLEY FORMER COTT HW7357 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |



'AMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1 3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | ,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.1 | | ug/kg | JDA | 11/05/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | JDA | 11/05/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 55.7 | | ug/kg | JDA | 11/05/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |

**Sample ID : AB84342**



'AMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 52.5 | | ug/kg | JDA | 11/05/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not Detected | | ug/kg | JDA | 11/05/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | JDA | 11/05/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | JDA | 11/05/97 |

**Sample comments :**

*End of Report*



'AMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
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| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

ATTACHMENT "D"

# FROST ASSOCIATES

88 Founders Village, Clinton, CT 06426
(860) 669-5859 FAX (860) 669-5859


September 16, 1997

To: Environmental Protection Division
205 Butler St., Floyd Towers East, Suite 1154
Atlanta, GA 30334

Attn: James Ussery

Fr: Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Fabra Care Cleaners
Fort Valley, GA

CERCLIS:

Job:

Site Longitude: 83-53-15.5 83.887642
Site Latitude : 32-33-08 32.552219

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the included Block Groups. Boundary records are then sorted in adjacent side order to determine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adjacent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)}

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 populu tion and house count extracted from the Census Bureau's 1990 STF-1A files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

Fabra Care Cleaners
Fort Valley, GA

| No. | City | Block Group ID | Blk Grp People | House Holds | Public Water | Drilled Wells | Dug Wells | Other |
|---|---|---|---|---|---|---|---|---|
| 1 | Zenith | 13079 0702 3 | 1021 | 358 | 35 | 298 | 42 | 0 |
| 2 | Marshallville | 13193 9801 1 | 889 | 327 | 245 | 66 | 28 | 0 |
| 3 | Marshallville | 13193 9801 2 | 1119 | 369 | 303 | 44 | 24 | 0 |
| 4 | Fort Valley | 13225 0402 1 | 1930 | 718 | 453 | 194 | 19 | 0 |
| 5 | Fort Valley | 13225 0402 2 | 1842 | 600 | 476 | 85 | 23 | 10 |
| 6 | Fort Valley | 13225 0404 1 | 4415 | 1258 | 1275 | 36 | 0 | 0 |
| 7 | Fort Valley | 13225 0404 2 | 1160 | 456 | 435 | 28 | 0 | 0 |
| 8 | Fort Valley | 13225 0404 3 | 132 | 49 | 4 | 24 | 4 | 0 |
| 9 | Fort Valley | 13225 0403011 | 2434 | 888 | 744 | 100 | 52 | 0 |
| 10 | Fort Valley | 13225 0403012 | 267 | 136 | 122 | 0 | 0 | 0 |
| 11 | Fort Valley | 13225 0403013 | 74 | 25 | 11 | 16 | 0 | 0 |
| 12 | Fort Valley | 13225 0403021 | 1773 | 728 | 702 | 45 | 0 | 0 |
| | Totals: | | 17056 | 5912 | 4805 | 936 | 192 | 10 |

Fabra Care Cleaners
Fort Valley, GA

| City | Census Tract ID | Tract People | House Count | Public Water | Drilled Wells | Dug Wells | Other Sources |
|---|---|---|---|---|---|---|---|
| Fort Valley | 13225 0404 2 | 1160 | 456 | 435 | 28 | 0 | 0 |
| Fort Valley | 13225 0404 3 | 132 | 49 | 4 | 24 | 4 | 0 |
| Fort Valley | 13225 0403011 | 2434 | 888 | 744 | 100 | 52 | 0 |
| Fort Valley | 13225 0402 1 | 1930 | 718 | 453 | 194 | 19 | 0 |
| Fort Valley | 13225 0402 2 | 1842 | 600 | 476 | 85 | 23 | 10 |
| Fort Valley | 13225 0404 1 | 4415 | 1258 | 1275 | 36 | 0 | 0 |
| Fort Valley | 13225 0403012 | 267 | 136 | 122 | 0 | 0 | 0 |
| Fort Valley | 13225 0403013 | 74 | 25 | 11 | 16 | 0 | 0 |
| Fort Valley | 13225 0403021 | 1773 | 728 | 702 | 45 | 0 | 0 |
| | Sub Totals: | 14027 | 4858 | 4222 | 528 | 98 | 10 |
| Marshallville | 13193 9801 1 | 889 | 327 | 245 | 66 | 28 | 0 |
| Marshallville | 13193 9801 2 | 1119 | 369 | 303 | 44 | 24 | 0 |
| | Sub Totals: | 2008 | 696 | 548 | 110 | 52 | 0 |
| Zenith | 13079 0702 3 | 1021 | 358 | 35 | 298 | 42 | 0 |
| | Sub Totals: | 1021 | 358 | 35 | 298 | 42 | 0 |

Fabra Care Cleaners
Fort Valley, GA

or Radius of 4 Mi., Circle Area = 50.265482

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 1 | Zenith | 13079 7023 | 54.974030 | 3.911922 | 7.12 |
| 2 | Marshallville | 13193 98011 | 32.482395 | 0.071163 | 0.22 |
| 3 | Marshallville | 13193 98012 | 44.204327 | 0.232980 | 0.53 |
| 4 | Fort Valley | 13225 4021 | 23.838928 | 9.110622 | 38.22 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 8.647540 | 34.26 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 6.760180 | 44.74 |
| 7 | Fort Valley | 13225 4042 | 3.236877 | 2.526381 | 78.05 |
| 8 | Fort Valley | 13225 4043 | 10.538761 | 0.837377 | 7.95 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 10.406000 | 92.17 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.132096 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533354 | 0.533354 | 100.00 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 7.095866 | 90.88 |
| | Totals: | | 229.388809 | 50.265484 | |

For Radius of 3 Mi., Circle Area = 28.274334

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 4.625260 | 19.40 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 5.102531 | 20.22 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 4.087371 | 27.05 |
| 7 | Fort Valley | 13225 4042 | 3.236877 | 1.235329 | 38.16 |
| 8 | Fort Valley | 13225 4043 | 10.538761 | 0.068782 | 0.65 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 7.687730 | 68.09 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.132096 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533354 | 0.533354 | 100.00 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 4.801882 | 61.50 |
| | Totals: | | 97.728050 | 28.274334 | |

For Radius of 2 Mi., Circle Area = 12.566371

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 1.856596 | 7.79 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 2.323050 | 9.20 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 2.179006 | 14.42 |
| 7 | Fort Valley | 13225 4042 | 3.236877 | 0.279146 | 8.62 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 3.111732 | 27.56 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.132096 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533354 | 0.182136 | 34.15 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 2.502609 | 32.05 |
| | Totals: | | 87.189293 | 12.566371 | |

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Fort Valley, GA

For Radius of 1 Mi., Circle Area = 3.141593

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 0.484847 | 2.03 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 0.901876 | 3.57 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 0.755243 | 5.00 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 0.359703 | 3.19 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.129773 | 98.24 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 0.510150 | 6.53 |
| | Totals: | | 83.419060 | 3.141593 | |

For Radius of .5 Mi., Circle Area = 0.785398

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 0.133213 | 0.56 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 0.235778 | 0.93 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 0.221664 | 1.47 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 0.194744 | 2.49 |
| | Totals: | | 71.996796 | 0.785398 | |

For Radius of .25 Mi., Circle Area = 0.196350

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 5 | Fort Valley | 13225 4022 | 25.240259 | 0.084988 | 0.34 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 0.037955 | 0.25 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 0.073407 | 0.94 |
| | Totals: | | 48.157867 | 0.196350 | |

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Fort Valley, GA

========== Site Data ==========

| | |
|---|---|
| Population: | 9754.95 |
| Households: | 3316.32 |
| Drilled Wells: | 309.62 |
| Dug Wells: | 66.56 |
| Other Water Sources: | 3.43 |

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

| | |
|---|---|
| Population: | 3371.40 |
| Households: | 1145.12 |
| Drilled Wells: | 125.55 |
| Dug Wells: | 22.79 |
| Other Water Sources: | 1.40 |

** Population On Private Wells: 436.75

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

| | |
|---|---|
| Population: | 3329.80 |
| Households: | 1123.25 |
| Drilled Wells: | 107.67 |
| Dug Wells: | 25.84 |
| Other Water Sources: | 1.10 |

** Population On Private Wells: 395.79

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

| | |
|---|---|
| Population: | 2231.75 |
| Households: | 731.42 |
| Drilled Wells: | 61.63 |
| Dug Wells: | 15.06 |
| Other Water Sources: | 0.56 |

** Population On Private Wells: 234.01

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

| | |
|---|---|
| Population: | 657.88 |
| Households: | 264.85 |
| Drilled Wells: | 11.33 |
| Dug Wells: | 2.54 |
| Other Water Sources: | 0.26 |

** Population On Private Wells: 34.47

Fabra Care Cleaners
Fort Valley, GA

--- Within Ring: .5 Mile(s) and .25 Mile(s) ----

| | |
|---|---|
| Population: | 111.95 |
| Households: | 36.00 |
| Drilled Wells: | 2.70 |
| Dug Wells: | 0.24 |
| Other Water Sources: | 0.06 |

** Population On Private Wells: 9.15

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

| | |
|---|---|
| Population: | 52.16 |
| Households: | 15.68 |
| Drilled Wells: | 0.74 |
| Dug Wells: | 0.08 |
| Other Water Sources: | 0.03 |

** Population On Private Wells: 2.71

** Total Population On Private Wells: 1112.89

ATTACHMENT "E"

# SITE INSPECTION SAMPLING AND ANALYSIS PLAN

## FORMER COTTON SEED OIL MILL

## FORT VALLEY, GEORGIA 31030

September 25, 1997

Prepared By:

**Georgia Department of Natural Resources**
**Environmental Protection Division**
**Hazardous Waste Management Branch**

Prepared By:
Faney L.H. Foster
Faney L.H. Foster
Environmental Engineer

Approved By:
Charles D. Williams
Derrick Williams
Program Manager I

TABLE OF CONTENTS

**SECTION NUMBER** ..... **PAGE**

1. Introduction ..... 3

2. Site Description ..... 3

   2.1 Location ..... 3
   2.2 Site Description ..... 3
   2.3 Operational History and Waste Characteristics ..... 3

3. Collection of Non-Sampling Data ..... 4

4. Sampling Activities ..... 4

   4.1 Source/Soil Sampling ..... 4
   4.2 Quality Assurance/Quality Control Procedures ..... 4
   4.3 Field Activities ..... 4

5. Investigation Derived Wastes Plan ..... 4

6. Project Management ..... 5

   6.1 Field Equipment/Health and Safety ..... 5
   6.2 Community Relations ..... 5
   6.3 Project Schedule ..... 5

References ..... 6

Figure 1: Site Location Map: U.S. Geologic Survey, 7.5 minute topographic quadrangle maps of Georgia
Figure 2: Site Layout and Proposed Sampling Map - Locations

Table 1 Site Sample Plan

Appendix A: Equipment List ..... 7

Appendix B: Site Safety Checklist ..... 7-A

## 1.0 INTRODUCTIO

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Reauthorization Act of 1986 (SARA), the Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch will conduct a site investigation (SI) at the Former Cotton Seed Oil Mill in Peach County, Georgia. The scope of this investigation will include the sampling of various environmental media to investigate the possible migration of hazardous substances from the site and to determine types and concentrations of hazardous substances present on site.

## 2.0 SITE DESCRIPTION, OPERATIONAL HISTORY AND WASTE CHARACTERISTICS

### 2.1 Location

Former Cotton Seed Oil Mill was located on what is now a vacant lot on Camellia Boulevard (SR 49) just north of College Street and east of Miller Street in Peach County. The geographic coordinates are 32° 33' 06.5" north latitude and 083° 53' 12.7" west longitude as shown on the United States Geological Survey (U.S.G.S.) Quadrangle Topographical Map, ( Reference 1. **Figure 1**).

To reach the site from Atlanta, take I-75 South through Macon and exit at SR 49 (exit #46) to the right in Peach County. Fort Valley is approximately 10 miles southwest of I-75 on SR 49.

The area is characterized by a warm and humid climate with long, hot summers and short, mild winters. The average rainfall is about 48 inches per year. March and July are normally the wettest months, each averaging more than five inches of rainfall. Fall is the driest part of the year, but no month has an average of less than two inches of rainfall (Soil Survey, 1967).

### 2.2 Site Description

The site was located on what is now a vacant city block in Fort Valley, Peach County, Georgia. The property is rectangular in shape and relatively flat. It contained a cotton seed oil mill, cotton warehouse and knitting mill.

### 2.3 Operational History and Waste Characteristics

The cotton seed oil mill, cotton warehouse and knitting mill were operational until the late 1920's. Since that time, the vacant building was damaged by a tornado in 1975 and later torn down in 1979.

The former Cotton Seed Oil Mill is being considered for a SI because perchloroethylen(PCE) has been detected above detection limits in the Fort Valley Municipal Water Supply Wells 1 and 2 located approximately 500 feet and 600 feet from the site, respectively . Although the use of PCE has not been verified at this site, the area of this site would be an optimum hydrologic location for a release of PCE to impact both city Wells 1 and 2 as well as monitoring well MW-4T next to the Anthoine Machine Works. This site is within the wellhead protection area of Municipal Wells 1 and 2.

## 3.0 COLLECTION OF NON-SAMPLING DATA

Non-sampling data collection activities will include verifying population and environmental information as well as obtaining new information. A reconnaissance survey performed on August 28, 1997 confirmed the location of Fort Valley Municipal Wells #1 and #2 and various site features. Additional data will be gathered as necessary.

## 4.0 SAMPLING ACTIVITIES

The objectives of the SI are to collect analytical data used to identify hazardous substances at the site, to investigate whether hazardous substances have been released to the environment, and to ascertain if any releases have impacted human health and the environment , according to the EPA Site Investigation score sheets. The proposed sampling plan calls for soil sampling. **Table 1** presents the sample numbers, description, and objective. Sampling locations are presented in **Figure 2**.

### 4.1 Source/Soil Sampling

Since the area of the site would be an optimum hydrologic location for a release of PCE to impact both city Wells 1 and 2 as well as monitoring well MW-4T next to the Anthoine Machine Work, the soil at the site is considered as a potential source of contamination:

Five subsurface soil samples will be collected. The location of these samples will be as follows: **sample #1** - in the middle of the site, **sample #2** - in the soil adjacent to the property and Railroad Street, **sample #3** - on the property at the corner of Railroad Street and Cameilia Blvd., **sample #4** - on the property next to the print shop, **sample #5** - on the property along Central Avenue.

### 4.4 Quality Assurance/Quality Control Procedures (QA/QC)

All sample collection, preservation and chain of custody procedures utilized during sampling activities will be in accordance with the standard operating guidelines specified in the U.S. EPA Environmental Compliance Branch SOP/QA Manual (2/1/91) sections 3 and 4. All on-site environmental media samples will be collected with dedicated sampling equipment. No decontamination of sampling equipment will be necessary between samples. New equipment will be used for each of the samples. All samples will be stored in coolers on ice until they reach the laboratory. Chain of custody will be maintained by the project manager until samples are hand delivered to the GAEPD laboratory located in Atlanta, Georgia.

### 4.5 Field Activities

Soil samples will be taken in 8 oz containers. Proposed sample locations are shown in **Figure 2**

## 5.0 INVESTIGATION DERIVED WASTES

Investigation derived wastes include personal protective equipment.

## 6.0 PROJECT MANAGEMENT

The project manager for the area of Fort Valley Municipal Wells 1 and 2 is Steve White. He will schedule field activities and personnel requirements, verify site access authority, and direct/oversee all field tasks. The sampling, documentation and managing of all collected samples at the Former Cotton Seed Oil Mill will be done by Faney Foster.

### 6.1 Field Equipment

Ambient air safety monitoring equipment will not be necessary on-site. Environmental media sampling activities will be conducted in level D personal protection equipment including disposable gloves, work boots, and regular cotton work clothes. Other items required for this investigation, including sampling equipment, are included in Appendix A: Equipment List.

### 6.2 Community Relations

No problems have been encountered in prior investigations, and none are anticipated.

### 6.3 Project Schedule

Non-sampling data collection began in December, 1996 and will continue through November, 1997. When the field activities are completed, preparation of the draft SI narrative report will begin. Analytical results will be validated and the final SI report will be completed.

## REFERENCES

1. White,Steve, Fort Valley Municipal Wells 1 and 2; Preliminary Assessment of Potential Sources of Contamination, June 3, 1997

## SITE INSPECTION SAMPLE PLAN

**Table 1**

| SAMPLE | LOCATION | DESCRIPTION | OBJECTIVE |
|---|---|---|---|
| **sample#1** | **I** | subsurface soil sample | to determine source |
| **sample#2** | **II** | subsurface soil sample | to determine source |
| **sample#3** | **III** | subsurface soil sample | to determine source |
| **sample#4** | **IV** | subsurface soil sample | to determine source |
| **sample#5** | **V** | subsurface soil sample | to determine source |

*** One background sample will be taken for all Fort Valley Sites**

# SITE INSPECTION SAMPLE PLAN
## Appendix A: Equipment List

**Sample Equipment:**

| | |
|---|---|
| 10 | 8 oz glass containers (VOC-5 soil samples, 5 extra) |
| 1 | large ice chest for sample preservation |
| 1 | box plastic zip lock bags for sample bottles and vials |
| 1 | box latex gloves |
| 10 | sample tags (5 for samples, 5 extras) |
| 1 | chain of custody form |
| 1 | box of garbage bags |
| 1 | camera with film |
| 3 | sampling spoons |
| 1 | water level tape |
| 1 | auger |
| 2 | indelible markers for sample identification |
| 1 | box/roll of paper towels |
| 1 | sprayer filled with 2-2 1/2 gallons deionized water for decontamination of measuring tape |
| 1 | trip blanks supplied by GEPD laboratory |

## Appendix B

**SITE SAFETY CHECKLIST:**

**Site Name:** Former Cotton Seed Oil Mill
**Address:** Peach County, Fort Valley, Georgia

**Type Of Investigation:** Site Inspection (SI)

**Personnel Log:**

| NAME | RESPONSIBILITY | ACKNOWLEDGMENT OF FAMILIARITY WITH SITE SAFETY PLAN* (INITIAL) | SUPERVISOR APPROVAL |
|---|---|---|---|
| Faney Foster | Project Manager | | |
| Steve White | Environmental Specialist/Sampling Assistant | | |
| Thomas Williams | Engineer/GeoProbe Operator | | |
| Bob Pierce | Geologist/Sampling Assistant | | |

*SITE SAFETY PLAN CONSISTS OF THIS AND ALL ATTACHED PAGES.

| EMERGENCY AND HAZARD INFORMATION | DESCRIPTION |
|---|---|
| **SPECIAL ACCESS REQUIREMENTS:** | none |
| **EMERGENCY PHONE NUMBERS:** | 911 system in this area |
| **POTENTIAL HAZARDS DESCRIPTION:** | uneven terrain, insect bites, snakes, volatile organic compounds (potential) |
| **PERSONAL PROTECTIVE EQUIPMENT (PPE) TO BE UTILIZED:** | steel-toe boots, hard hat, safety glasses, latex gloves (when sampling) and hearing protection (if necessary) |

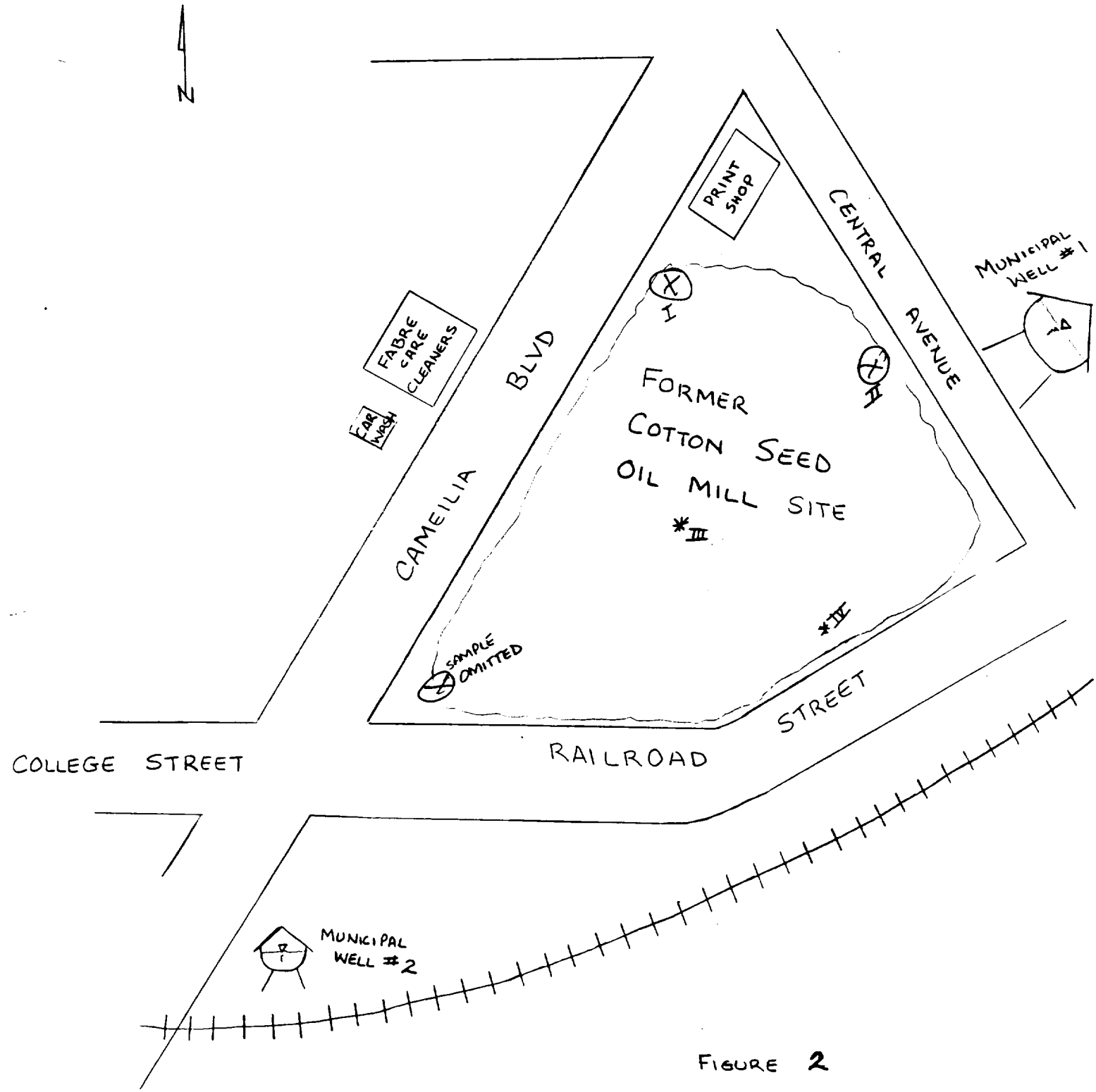



FIGURE 2

NOT TO SCALE

## GENERAL INFORMATION

ILITY NAME: FORMER COTTON SEED OIL MILL CONTACT _____

DIRECTIONS TO FACILITY: (Attach map if possible)

I-75 S TO EXIT # 46 (RT), 10 MILES TO FORT VALLEY

SPECIAL ACCESS REQUIREMENTS: NONE

## EMERGENCY INFORMATION

AMBULANCE: PEACH COUNTY EMS TELEPHONE: 825-2616
HOSPITAL: PEACH REGIONAL MEDICAL CENTER TELEPHONE: 825-8691
POLICE: PEACH COUNTY TELEPHONE: 825-3382
FIRE DEPARTMENT: PEACH COUNTY TELEPHONE: 825-5190
SITE/FIRE EVACUATION SIGNALS: _____

## INFORMATION SOURCES

PART B: _____ STATE: _____ CONTINGENCY PLAN: _____
ESD: _____ RFA: _____ CLOSURE PLAN: _____
QUESTIONNAIRE: _____ PART A: _____ OTHER: _____

## PERMITS

HAZARDOUS WASTE: _____ STATUS _____
WATER: _____ AIR: _____ OTHER: _____

## SUMMARY OR REGULATED UNITS AND SWMUS: (Indicate number of units)

LANDFILLS: _____ INCINERATORS: _____ STORAGE AREAS: _____
WASTE PILES: _____ OTHER TREATMENT: _____ OTHER: _____
SURFACE IMPROVEMENTS: _____ TANK FARMS: _____ SWMUS: _____

## FACILITY PROCESS DESCRIPTION

PREVIOUS RELEASES/ACCIDENTS OR COMPLAINTS: (Corrected? YES/NO)

| | |
|---|---|
| AIR | NO |
| SOIL | |
| SURFACE WATER | |
| INDUSTRIAL ACCIDENTS | |
| COMPLAINTS | |

HEALTH AND SAFETY HAZARDS

Briefly indicate hazard type. Attach additional pages if necessary.

EXPLOSION/OXYGEN DEFICIENCY HAZARDS: NONE (Circle if applicable)

RADIATION HAZARDS: NONE (Circle if applicable)

TOXIC HAZARDS: NONE (Circle if applicable)

Briefly summarize chemicals handled on site: Add attachment if necessary. Indicate if these exist in a controlled state. Refer to Part A Application if list is extensive.

UNUSUAL PHYSICAL HAZARDS: NONE (Circle if applicable)

UNUSUAL BIOLOGICAL HAZARDS: NONE (Circle if applicable)

CHECK IF PROBLEM EXPECTED: NOISE____ HEAT STRESS____ COLD STRESS____

OVERALL HAZARD RATING: (CIRCLE ONE)

| VERY HIGH | HIGH | MEDIUM | LOW |
|---|---|---|---|
| (LEVEL A) | (LEVEL B) | (LEVEL C) | (LEVEL D) |
| (ASSISTANCE NECESSARY) | (ASSISTANCE NECESSARY) | (MONITORING REQUIRED) | |

## PERSONNEL PROTECTIVE EQUIPMENT

st equipment needed in addition to safety glasses, hard hat, and steel toed boots)

| | Check if Needed | | Needed throughout entire facility? (If no, list area(s) or task(s) where needed |
|---|---|---|---|
| **HEAD AND EYE** | | | |
| FACE SHIELD | | | |
| GOGGLES | ✓ | | |
| NOISE PROTECTION | | | |
| OTHER | | | |
| **RESPIRATORY:** | | TYPE | |
| APR | | N/A | |
| APR CARTRIDGE | | | |
| ESCAPE MASK | | | |
| OTHER | | | |
| **CLOTHING:** | | | |
| TYVEK COVERALL | | | |
| SARANEX COVERALL | | | |
| COTTON COVERALL | | | |
| SPLASH SUIT | | | |
| OVERBOOTS | | | |
| RAIN GEAR | | | |
| OTHER | ✓ | SAFETY BOOTS | |
| **MISCELLANEOUS:** | | | |
| | | | |
| | | | |
| | | | |

| LEVEL A OR B NEEDED? | Contractor or ESD? | Areas/tasks where needed |
|---|---|---|
| LEVEL A N/A | | |
| LEVEL B | | |

| AIR MONITORING TYPE | Conducted by | Areas/tasks where needed |
|---|---|---|
| TOXIC N/A | FACILITY | |
| EXPLOSIVE/OXYGEN | ESD | |
| RADIATION | OTHER | |
| NONE | OTHER | |

# SITE INSPECTION WORKSHEETS

| CERCLIS IDENTIFICATION NUMBER |
|---|
| |

| SITE LOCATION | | | |
|---|---|---|---|
| SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE<br>FORMER COTTON SEED OIL MILL | | | |
| STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFIER<br>VACANT LOT ON CAMELLIA BLVD | | | |
| CITY<br>FORT VALLEY | STATE<br>GA | ZIP CODE | TELEPHONE<br>( ) |
| COORDINATES: LATITUDE and LONGITUDE<br>32° 33' 06.5" NORTH<br>83° 53' 12.7" WEST | TOWNSHIP, RANGE, AND SECTION | | |

| OWNER/OPERATOR IDENTIFICATION | | | | | |
|---|---|---|---|---|---|
| OWNER | | | OPERATOR | | |
| OWNER ADDRESS | | | OPERATOR ADDRESS | | |
| CITY | | | CITY | | |
| STATE | ZIP CODE | TELEPHONE<br>( ) | STATE | ZIP CODE | TELEPHONE<br>( ) |

| SITE EVALUATION | | |
|---|---|---|
| AGENCY/ORGANIZATION<br>EPD / HAZ WASTE MGMT BRANCH | | |
| INVESTIGATOR<br>FANEY LH FOSTER | | |
| CONTACT | | |
| ADDRESS<br>205 BUTLER ST SUITE 1154 EAST | | |
| CITY<br>ATLANTA | STATE<br>GA | ZIP CODE<br>30303 |
| TELEPHONE<br>(404) 651-7524 | | |

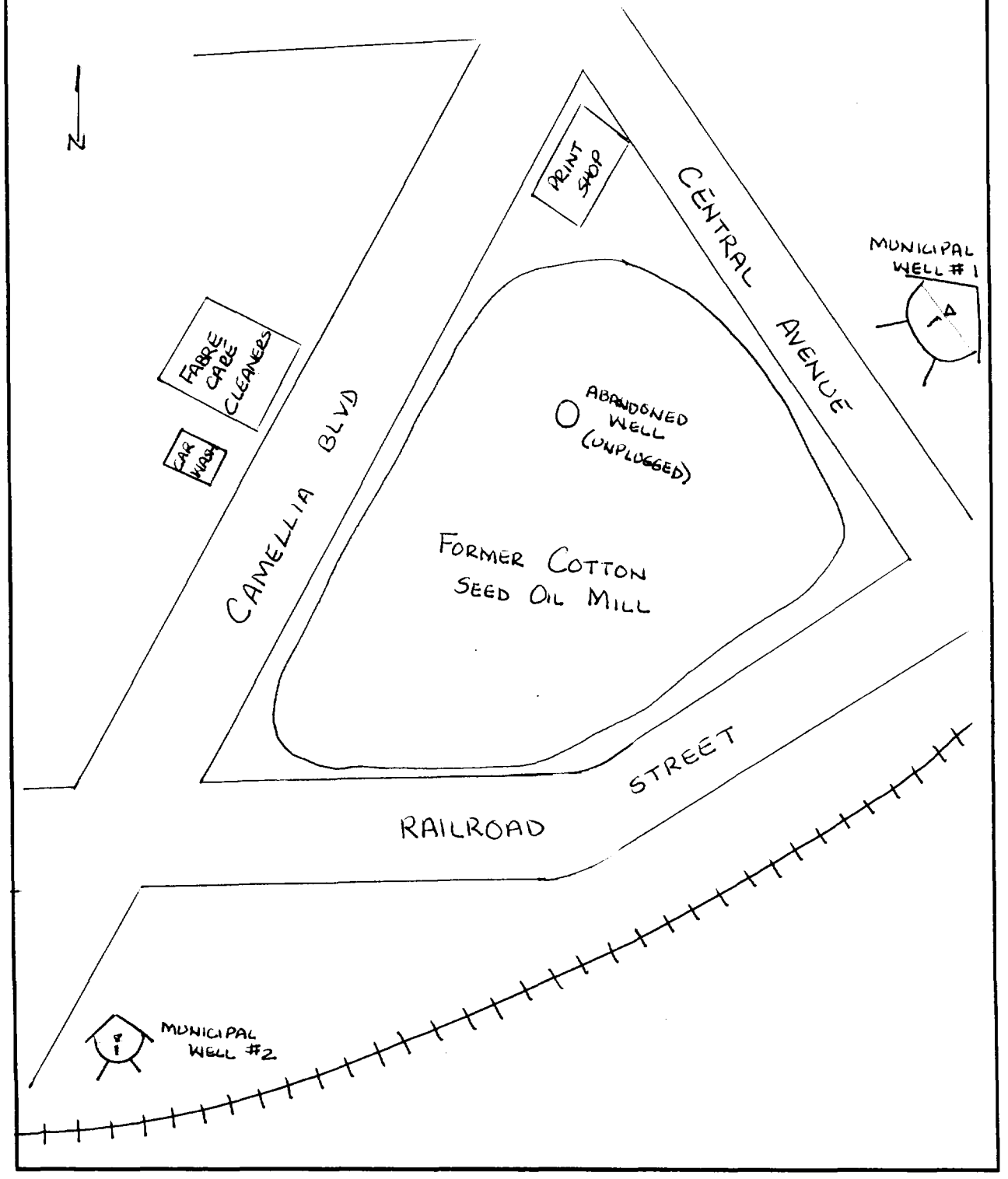
## GENERAL INFORMATION

**Site Description and Operational History:** Provide a brief description of the site and its operational history. State the site name, owner, operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note whether these activities are documented or alleged. Identify all source types and prior spills, floods, or fires. Summarize highlights of the PA and other investigations. Cite references.

THE SITE IS LOCATED ON A VACANT LOT IN THE CITY OF FORT VALLEY, PEACH COUNTY, GEORGIA. THE FORMER COTTON SEED OIL MILL WAS LOCATED ON A ~~EO~~ 150' X 200' LOT WHICH ALSO CONTAINED A COTTON WAREHOUSE AND KNITTING MILL. THE MILL WAS OPERATIONAL UNTIL THE LATE 1920'S. SINCE THAT TIME THE BUILDING WAS VACANT UNTIL 1975 WHEN IT WAS DAMAGED BY A TORNADO AND LATER TORN DOWN IN 1979.

## GENERAL INFORMATION (continued)

**Site Sketch:** Provide a sketch of the site. Indicate all pertinent features of the site and nearby environments including sources of wastes, areas of visible and buried wastes, buildings, residences, access roads, parking areas, fences, fields, drainage patterns, water bodies, vegetation, wells, sensitive environments, and other features.



## GENERAL INFORMATION (continued)

**Source Descriptions:** Describe all sources at the site. Identify source type and relate to waste disposal operations. Provide source dimensions and the best available waste quantity information. Describe the condition of sources and all containment structures. Cite references.

## SOURCE TYPES

**Landfill**: A man-made (by excavation or construction) or natural hole in the ground into which wastes have come to be disposed by backfilling, or by contemporaneous soil deposition with waste disposal.

**Surface Impoundment:** A natural topographic depression, man-made excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold an accumulation of liquid wastes, wastes containing free liquids, or sludges not backfilled or otherwise covered; depression may be wet with exposed liquid or dry if deposited liquid has evaporated, volatilized or leached; structures that may be described as lagoon, pond, aeration pit, settling pond, tailings pond, sludge pit; also a surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled).

**Drum:** A portable container designed to hold a standard 55-gallon volume of wastes.

**Tank and Non-Drum Container**: Any device, other than a drum, designed to contain an accumulation of waste that provides structural support and is constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic); any portable or mobile device in which waste is stored or otherwise handled.

**Contaminated Soil:** An area or volume of soil onto which hazardous substances have been spilled, spread, disposed, or deposited.

**Pile**: Any non-containerized accumulation above the ground surface of solid, non-flowing wastes; includes open dumps. Some types of waste piles are:

- Chemical Waste Pile: A pile consisting primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks.
- Scrap Metal or Junk Pile: A pile consisting primarily of scrap metal or discarded durable goods (such as appliances, automobiles, auto parts, batteries, etc.) composed of materials containing hazardous substances.
- Tailings Pile: A pile consisting primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation.
- Trash Pile: A pile consisting primarily of paper, garbage, or discarded non-durable goods containing hazardous substances.

**Land Treatment**: Landfarming or other method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

**Other**: Sources not in categories listed above.

## GENERAL INFORMATION (continued)

**Source Description:** Include description of containment per pathway for ground water (see HRS Table 3-2), surface water (see HRS Table 4-2), and air (see HRS Tables 6-3 and 6-9).

N/A

**Hazardous Waste Quantity (HWQ) Calculation:** SI Tables 1 and 2 (See HRS Tables 2-5, 2-6, and 5-2).

1 ACRE 78 ACRE CONTAMINATED SOIL

∴ HWQ = 10

Attach additional pages, if necessary

HWQ = 10

## SI TABLE 1: HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

| | | Single Source Sites (assigned HWQ scores) | |
|---|---|---|---|
| (Column 1)<br>TIER | (Column 2)<br>Source Type | (Column 3)<br>HWQ = 10 | (Column 4)<br>HWQ = 100 |
| **A**<br>Hazardous Constituent Quantity | N/A | HWQ = 1 if Hazardous Constituent Quantity data are complete<br><br>HWQ = 10 if Hazardous Constituent Quantity data are not complete | >100 to 10,000 lbs |
| **B**<br>Hazardous Wastestream Quantity | N/A | ≤ 500,000 lbs | >500,000 to 50 million lbs |
| **C**<br>Volume | Landfill | ≤ 6.75 million $ft^3$<br>≤ 250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ |
| | Surface impoundment | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| | Drums | ≤1,000 drums | >1,000 to 100,000 drums |
| | Tanks and non-drum containers | ≤50,000 gallons | >50,000 to 5 million gallons |
| | Contaminated soil | ≤6.75 million $ft^3$<br>≤250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ |
| | Pile | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| | Other | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| **D**<br>Area | Landfill | ≤340,000 $ft^2$<br>≤7.8 acres | >340,000 to 34 million $ft^2$<br>>7.8 to 780 acres |
| | Surface impoundment | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres |
| | Contaminated soil | ≤3.4 million $ft^2$<br>≤78 acres | > 3.4 million to 340 million $ft^2$<br>> 78 to 7,800 acres |
| | Pile | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres |
| | Land treatment | ≤27,000 $ft^2$<br>≤0.62 acres | >27,000 to 2.7 million $ft^2$<br>>0.62 to 62 acres |

TABLE 1 (CONTINUED)

| Single Source Sites (assigned HWQ scores) | | Multiple Source Sites | | |
|---|---|---|---|---|
| (Column 5) HWQ = 10,000 | (Column 6) HWQ = 1,000,000 | (Column 7) Divisors for Assigning Source WQ Values | (Column 2) Source Type | (Column 1) TIER |
| >10,000 to 1 million lbs | > 1 million lbs | lbs ÷ 1 | N/A | A Hazardous Constituent Quantity |
| >50 million to 5 billion lbs | > 5 billion lbs | lbs ÷ 5,000 | N/A | B Hazardous Wastestream Quantity |
| >675 million to 67.5 billion $ft^3$<br>>25 million to 2.5 billion $yd^3$ | > 67.5 billion $ft^3$<br>> 2.5 billion $yd^3$ | $ft^3$ ÷ 67,500<br>$yd^3$ ÷ 2,500 | Landfill | C Volume |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Surface Impoundment | |
| >100,000 to 10 million drums | > 10 million drums | drums ÷ 10 | Drums | |
| >5 million to 500 million gallons | > 500 million gallons | gallons ÷ 500 | Tanks and non-drum containers | |
| >675 million to 67.5 billion $ft^3$<br>>25 million to 2.5 billion $yd^3$ | > 67.5 billion $ft^3$<br>> 2.5 billion $yd^3$ | $ft^3$ ÷ 67,500<br>$yd^3$ ÷ 2,500 | Contaminated Soil | |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Pile | |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Other | |
| >34 million to 3.4 billion $ft^2$<br>>780 to 78,000 acres | > 3.4 billion $ft^2$<br>>78,000 acres | $ft^2$ ÷ 3,400<br>acres ÷ 0.078 | Landfill | D Area |
| >130,000 to 13 million $ft^2$<br>>2.9 to 290 acres | > 13 million $ft^2$<br>> 290 acres | $ft^2$ ÷ 13<br>acres ÷ 0.00029 | Surface Impoundment | |
| > 340 million to 34 billion $ft^2$<br>> 7,800 to 780,000 acres | > 34 billion $ft^2$<br>> 780,000 acres | $ft^2$ ÷ 34,000<br>acres ÷ 0.78 | Contaminated Soil | |
| > 130,000 to 13 million $ft^2$<br>> 2.9 to 290 acres | > 13 million $ft^2$<br>> 290 acres | $ft^2$ ÷ 13<br>acres ÷ 0.00029 | Pile | |
| >2.7 million to 270 million $ft^2$<br>>62 to 6,200 acres | > 270 million $ft^2$<br>> 6,200 acres | $ft^2$ ÷ 270<br>acres ÷ 0.0062 | Land Treatment | |

## HAZARDOUS WASTE QUANTITY (HWQ) CALCULATION

For each migration pathway, evaluate HWQ associated with sources that are available (i.e., incompletely contained) to migrate to that pathway. (Note: If *Actual Contamination Targets* exist for ground water, surface water, or air migration pathways, assign the calculated HWQ score or 100, whichever is greater, as the HWQ score for that pathway.) For each source, evaluate HWQ for one or more of the four tiers (SI Table 1; HRS Table 2-5) for which data exist: constituent quantity, wastestream quantity, source volume, and source area. Select the tier that gives the highest value as the source HWQ. Select the source volume HWQ rather than source area HWQ if data for both tiers are available.

Column 1 of SI Table 1 indicates the quantity tier. Column 2 lists source types for the four tiers. Columns 3, 4, 5, and 6 provide ranges of waste amount for sites with only one source, corresponding to HWQ scores at the tops of the columns. Column 7 provides formulas to obtain source waste quantity values at sites with multiple sources.

1. Identify each source type.
2. Examine all waste quantity data available for each source. Record constituent quantity and waste stream mass or volume. Record dimensions of each source.
3. Convert source measurements to appropriate units for each tier to be evaluated.
4. For each source, use the formulas in the last column of SI Table 1 to determine the waste quantity value for each tier that can be evaluated. Use the waste quantity value obtained from the highest tier as the quantity value for the source. $1 \div .78 = 1.28$
5. Sum the values assigned to each source to determine the total site waste quantity.
6. Assign HWQ score from SI Table 2 (HRS Table 2-6).

Note these exceptions to evaluate soil exposure pathway HWQ (see HRS Table 5-2):

- The divisor for the area (square feet) of a landfill is 34,000.
- The divisor for the area (square feet) of a pile is 34.
- Wet surface impoundments and tanks and non-drum containers are the only sources for which volume measurements are evaluated for the soil exposure pathway.

**SI TABLE 2: HWQ SCORES FOR SITES**

| Site WQ Total | HWQ Score |
|---|---|
| 0 | 0 |
| 1[a] to 100 | 1[b] |
| > 100 to 10,000 | 100 |
| > 10,000 to 1 million | 10,000 |
| > 1 million | 1,000,000 |

[a] If the WQ total is between 0 and 1, round it to 1.
[b] If the hazardous constituent quantity data are not complete, assign the score of 10.

## SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

Site Name: _____ References _____

**Sources:**

1. N/A
2.
3.
4.
5.
6.
7.
8.
9.

| SOURCE | HAZARDOUS SUBSTANCE | TOXICITY | GROUND WATER PATHWAY | | SURFACE WATER PATHWAY | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | OVERLAND/FLOOD MIGRATION | | | | | | | GROUND WATER TO SURFACE WATER | | | |
| | | | GW Mobility (HRS Table 3-8) | Tox/ Mobility Value (HRS Table 3-9) | Per (HRS Tables 4-10 and 4-11) | Tox/Per Value (HRS Table 4-12) | Bioac Pot. (HRS Table 4-15) | Tox/ Pers/ Bioac Value (HRS Table 4-16) | Ecotox (HRS Table 4-19) | Ecotox/ Pers (HRS Table 4-20) | Ecotox/ Pers/ Bioacc Value (HRS Table 4-21) | Tox/ Mob/ Pers Value (HRS Table 4-26) | Tox/ Mob/ Pers/ Bioacc Value (HRS Table 4-28) | Ecotox/ Mob/ Pers Value (HRS Table 4-29) | Ecotox/ Mob/ Per/ Bioacc Value (HRS Table 4-30) |
| | NONE | | | | | | | | | | | | | | |

### Ground Water Observed Release Substances Summary Table

On SI Table 4, list the hazardous substances associated with the site detected in ground water samples for that aquifer. Include only those substances directly observed or with concentrations significantly greater than background levels. Obtain toxicity values from the Superfund Chemical Data Matrix (SCDM). Assign mobility a value of 1 for all observed release substances regardless of the aquifer being evaluated. For each substance, multiply the toxicity by the mobility to obtain the toxicity/mobility factor value; enter the highest toxicity/mobility value for the aquifer in the space provided.

### Ground Water Actual Contamination Targets Summary Table

If there is an observed release at a drinking water well, enter each hazardous substance meeting the requirements for an observed release by well and sample ID on SI Table 5 and record the detected concentration. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population using the well as a Level I target. If these percentages are less than 100% or all are N/A, evaluate the population using the well as a Level II target for that aquifer.

## SI TABLE 4: GROUND WATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

| Sample ID | Hazardous Substance | Bckgrd. Conc. | Toxicity/ Mobility | References |
|---|---|---|---|---|
| NONE | | | NA | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | Highest Toxicity/Mobility | 0 | |

## SI TABLE 5: GROUND WATER ACTUAL CONTAMINATION TARGETS

Well ID: MUNICIPAL WELL 1 Level I _____ Level II X Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| NONE | NONE | NA | NA | NA | NA | NA | NA | NA |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | NA |

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

## GROUND WATER PATHWAY
## GROUND WATER USE DESCRIPTION

**Describe Ground Water Use within 4 Miles of the Site:**
Describe generalized stratigraphy, aquifers, municipal and private wells

THE CLAYTON AQUIFER IS THE MOST SHALLOW AQUIFER IN FORT VALLEY. THE DEEPEST AQUIFER IS THE TUSCALOOSA AQUIFER WHICH IS AT A DEPTH OF ABOUT 250 FEET BELOW LAND SURFACE. THIS AQUIFER IS THE PRIMARY SOURCE OF GROUND WATER TO MUNICIPAL WELL 1 & 2. APPROXIMATELY 1/3 RESIDENTS USE PRIVATE WELLS FOR DRINKING WATER (REF. 4). ALTHOUGH MUNICIPAL WELL 1 AND 2 ARE CONTAMINATED, PRIOR LAND USE OR SAMPLE RESULTS FOR THIS SITE HAVE NOT CONTRIBUTED TO THE CONTAMINATION. THEREFORE OTHER SITES IN FORT VALLEY ARE BEING CONSIDERED FOR THE SOURCE OF CONTAMINATION.

**Show Calculations of Ground Water Drinking Water Populations for each Aquifer:**
Provide apportionment calculations for blended supply systems.
County average number of persons per household: 3 Reference 4

| DISTANCE | POPULATION ON MUNICIPAL WATER | POPULATION ON PRIVATE WELL |
|---|---|---|
| 0 - 1/4 MI | 53 | 3 |
| 1/4 - 1/2 | 112 | 10 |
| 1/2 - 1 | 658 | 35 |
| 1 - 2 | 2232 | 234 |
| 2 - 3 | 3330 | 396 |
| 3 - 4 | 3372 | 437 |

# GROUND WATER PATHWAY WORKSHEET

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4. | 0 | | |
| 2. POTENTIAL TO RELEASE: Depth to aquifer: _____feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3. | 340 | | |
| LR = | 340 | | |

| TARGETS | | | |
|---|---|---|---|
| Are any wells part of a blended system? Yes____ No_____ If yes, attach a page to show apportionment calculations. | | | |
| 3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5).<br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ Total = | 0 | | |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1. | 692 | | |
| 5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles, assign 0. | 20 | | |
| 6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a ground water observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0. | 20 | | |
| 7. RESOURCES: Assign a score of 5 if one or more ground water resource applies; assign 0 if none applies.<br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering of commercial livestock<br>• Ingredient in commercial food preparation<br>• Supply for commercial aquaculture<br>• Supply for a major or designated water recreation area, excluding drinking water use | 0 | | |
| Sum of Targets T= | 732 | | |

## SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS

### SI Table 6a: Other Than Karst Aquifers

| Distance from Site | Pop. | Nearest Well (choose highest) | Population Served by Wells within Distance Category | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to $\frac{1}{4}$ mile | 52<br>8400 | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | 5267 | 4 |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | 112 | 18 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | 102 | 4 |
| > $\frac{1}{2}$ to 1 mile | 658 | 9 | 1 | 5 | 17 | 52 | 167 | 523 | 1,669 | 5,224 | 16,684 | 52,239 | 166,835 | 522,385 | 167 | 4 |
| > 1 to 2 miles | 2232 | 5 | 0.7 | 3 | 10 | 30 | 94 | 294 | 939 | 2,939 | 9,385 | 29,384 | 93,845 | 293,842 | 294 | 4 |
| > 2 to 3 miles | 3330 | 3 | 0.5 | 2 | 7 | 21 | 68 | 212 | 678 | 2,122 | 6,778 | 21,222 | 67,777 | 212,219 | 678 | 4 |
| >3 to 4 miles | 3372 | 2 | 0.3 | 1 | 4 | 13 | 42 | 131 | 417 | 1,306 | 4,171 | 13,060 | 41,709 | 130,596 | 417 | 4 |

Nearest Well = 20

Sum = 6925

## SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS (continued)

### SI Table 6b: Karst Aquifers

| Distance from Site | Pop. | Nearest Well (choose highest) | Population Served by Wells within Distance Category | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to $\frac{1}{4}$ mile | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | | |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | | 20 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | | |
| > $\frac{1}{2}$ to 1 mile | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| > 1 to 2 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| > 2 to 3 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| >3 to 4 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |

**Nearest Well =** [ ]

**Sum =** [ ]

## GROUND WATER PATHWAY WORKSHEET (concluded)

| WASTE CHARACTERISTICS | Score | Data Type | Does not Apply |
|---|---|---|---|
| 8. If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to ground water. | 10 | | |
| 9. Assign the highest ground water toxicity/mobility value from SI Table 3 or 4. | 0 | | |
| 10. Multiply the ground water toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7) | 0 | | |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

WC = 0

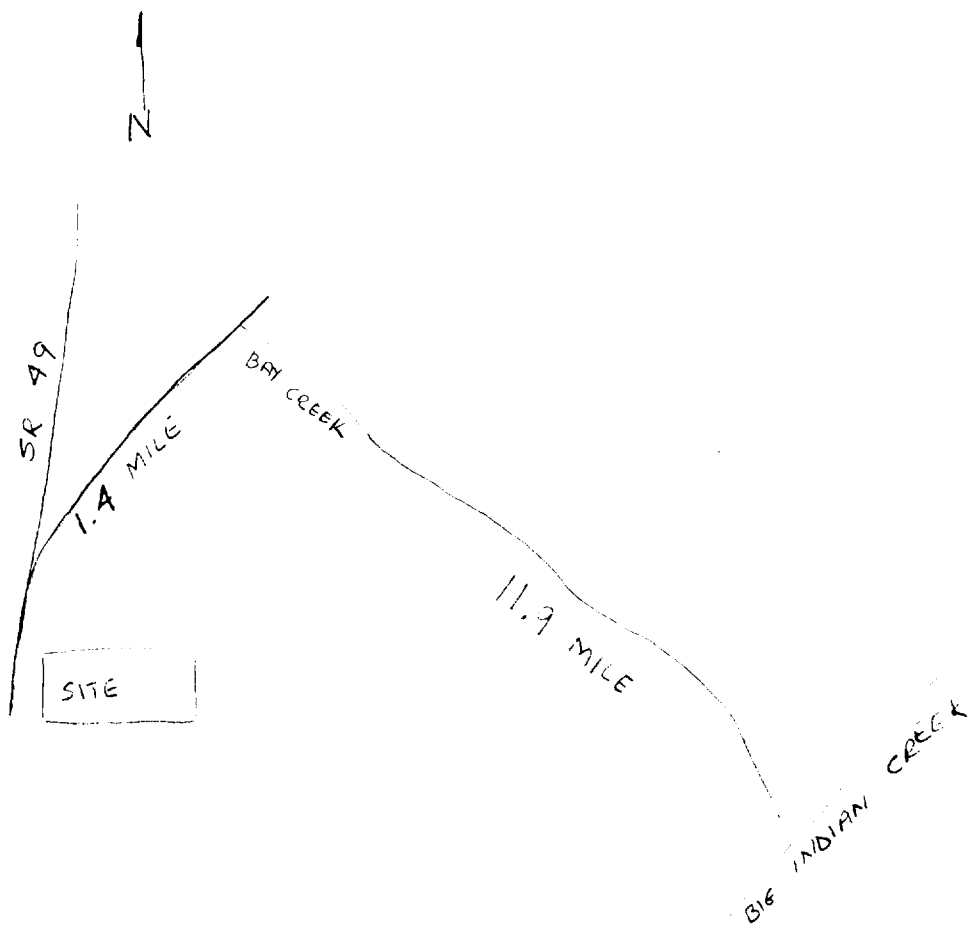
Multiply LR by T and by WC. Divide the product by 82,500 to obtain the ground water pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

**GROUND WATER PATHWAY SCORE:** $\frac{LR \times T \times WC}{82,500}$ = 0 (Maximum of 100)

$$\frac{340 \times 732 \times 0}{82,500}$$

# SURFACE WATER PATHWAY

**Sketch of the Surface Water Migration Route:**
Label all surface water bodies. Include runoff route and drainage direction, probable point of entry, and 15-mile target distance limit. Mark sample locations, intakes, fisheries, and sensitive environments. Indicate flow directions, tidal influence, and rate.



## SURFACE WATER PATHWAY

### Surface Water Observed Release Substances Summary Table

On SI Table 7, list the hazardous substances detected in surface water samples for the watershed, which can be attributed to the site. Include only those substances in observed releases (direct observation) or with concentration levels significantly above background levels. Obtain toxicity, persistence, bioaccumulation potential, and ecotoxicity values from SCDM. Enter the highest toxicity/persistence, toxicity/persistence/bioaccumulation, and ecotoxicity/persistence/ecobioaccumulation values in the spaces provided.

- TP = Toxicity x Persistence
- TPB = TP x bioaccumulation
- ETPB = EP x bioaccumulation (EP = ecotoxicity x persistence)

### Drinking Water Actual Contamination Targets Summary Table

For an observed release at or beyond a drinking water intake, on SI Table 8 enter each hazardous substance by sample ID and the detected concentration. For surface water sediment samples detecting a hazardous substance at or beyond an intake, evaluate the intake as Level II contamination. Obtain benchmark, cancer risk, and reference dose concentrations for each substance from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages of the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population served by the intake as a Level I target. If the percentages are less than 100% or all are N/A, evaluate the population served by the intake as a Level II target.

## SI TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

| Sample ID | Hazardous Substance | Bckgrd. Conc. | Toxicity/ Persistence | Toxicity/ Persis./ Bioaccum | Ecotoxicity/ Persis/ Ecobioaccum | References |
|---|---|---|---|---|---|---|
| | N/A | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | Highest Values | | | | |

## SI TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS

Intake ID: _____ Sample Type _____ Level I _____ Level II X Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | N/A | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# SURFACE WATER PATHWAY
## LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

| LIKELIHOOD OF RELEASE- OVERLAND/FLOOD MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. | | | |
| 2. POTENTIAL TO RELEASE: Distance to surface water: 7342 (feet) If sampling data do not support a release to surface water in the watershed, use the table below to assign a score from the table below based on distance to surface water and flood frequency. | 100 | | 6 |
| Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2 | | | |
| LR = | 100 | | |

| Distance to surface water <2500 feet | 500 |
|---|---|
| Distance to surface water >2500 feet, and: | |
| Site in annual or 10-yr floodplain | 500 |
| Site in 100-yr floodplain | 400 |
| Site in 500-yr floodplain | 300 |
| Site outside 500-yr floodplain | 100 |

| LIKELIHOOD OF RELEASE GROUND WATER TO SURFACE WATER MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. | | | |
| NOTE: Evaluate ground water to surface water migration only for a surface water body that meets all of the following conditions:<br>1) A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0.<br>2) No aquifer discontinuity is established between the source and the above portion of the surface water body.<br>3) The top of the uppermost aquifer is at or above the bottom of the surface water.<br>Elevation of top of uppermost aquifer _____<br>Elevation of bottom of surface water body _____ | | | |
| 2. POTENTIAL TO RELEASE: Use the ground water potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2. | 340 | | |
| LR = | 340 | | |

# SURFACE WATER PATHWAY
## LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET (CONTINUED)

| DRINKING WATER THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type, flow, and number of people served by each drinking water intake within the target distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5.<br><br>Intake Name ____ Water Body Type ____ Flow ____ People Served ____<br>____ ____ ____ ____<br>____ ____ ____ ____<br>____ ____ ____ ____<br><br>Are any intakes part of a blended system? Yes _____ No _____<br>If yes, attach a page to show apportionment calculations.<br><br>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8).<br><br>_____ , _____<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ **Total =** | 0 | | Fig 3 |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1. | 0 | | |
| 5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0. | 0 | | |
| 6. RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign 0 if none applies.<br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering of commercial livestock<br>• Ingredient in commercial food preparation<br>• Major or designated water recreation area, excluding drinking water use | 0 | | |
| **SUM OF TARGETS T=** | 0 | | |

## SI TABLE 9 (From HRS Table 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY

| Type of Surface Water Body | Pop. | Nearest Intake | Number of people | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,000 | 10,001 to 30,000 | |
| Minimal Stream (<10 cfs) | | 20 | 0 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | |
| Small to moderate stream (10 to 100 cfs) | | 2 | 0 | 0.4 | 2 | 5 | 16 | 52 | 163 | 521 | 1,633 | |
| Moderate to large stream (> 100 to 1,000 cfs) | | 0 | 0 | 0.04 | 0.2 | 0.5 | 2 | 5 | 16 | 52 | 163 | |
| Large Stream to river (>1,000 to 10,000 cfs) | | 0 | 0 | 0.004 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | 5 | 16 | |
| Large River (> 10,000 to 100,000 cfs) | | 0 | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 16 | |
| Very Large River (>100,000 cfs) | | 0 | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Shallow ocean zone or Great Lake (depth < 20 feet) | | 0 | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | |
| Moderate ocean zone or Great Lake (Depth 20 to 200 feet) | | 0 | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Deep ocean zone or Great Lake (depth > 200 feet) | | 0 | 0 | 0 | 0 | 0 | 0.001 | 0.003 | 0.008 | 0.03 | 0.08 | |
| 3-mile mixing zone in quiet flowing river (≥ 10 cfs) | | 10 | 0 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | |

Nearest Intake = 0

NO INTAKES

Sum = 0

References 4

## SURFACE WATER PATHWAY

### Human Food Chain Actual Contamination Targets Summary Table

On SI Table 10, list the hazardous substances detected in sediment, aqueous, sessile benthic organism tissue, or fish tissue samples (taken from fish caught within the boundaries of the observed release) by sample ID and concentration. Evaluate fisheries within the boundaries of observed releases detected by sediment or aqueous samples as Level II, if at least one observed release substance has a bioaccumulation potential factor value of 500 or greater (see SI Table 7). Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For FDAAL benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate this portion of the fishery as subject to Level I concentrations. If the percentages are less than 100% or all are N/A, evaluate the fishery as a Level II target.

### Sensitive Environment Actual Contamination Targets Summary Table

On SI Table 11, list each hazardous substance detected in aqueous or sediment samples at or beyond wetlands or a surface water sensitive environment by sample ID. Record the concentration. If contaminated sediments or tissues are detected at or beyond a sensitive environment, evaluate the sensitive environment as Level II. Obtain benchmark concentrations from SCDM. For AWQC/AALAC benchmarks, determine the highest percentage of benchmark of the substances detected in aqueous samples. If benchmark concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage equals or exceeds 100%, evaluate that part of the sensitive environment subject to Level I concentrations. If the percentage is less than 100%, or all are N/A, evaluate the sensitive environment as Level II.

## SI TABLE 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Fishery ID: _____ Sample Type _____ Level I _____ Level II _____ References _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Benchmark Concentration (FDAAL) | % of Benchmark | Cancer Risk Concentration. | % of Cancer Risk Concentration | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | N/A | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

## SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

| Sample ID | Hazardous Substance | Conc.. (µg/L) | Benchmark Concentration (AWQC or AALAC) | % of Benchmark | References |
|---|---|---|---|---|---|
| | N/A | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | Highest Percent | | |

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

| Sample ID | Hazardous Substance | Conc.. (µg/L) | Benchmark Concentration (AWQC or AALAC) | % of Benchmark | References |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | Highest Percent | | |

## SURFACE WATER PATHWAY (continued)
## HUMAN FOOD CHAIN THREAT WORKSHEET

| HUMAN FOOD CHAIN THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page. | | | |

Fishery Name_____ Water Body_____ Flow_____cfs

Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

Fishery Name_____ Water Body_____ Flow_____cfs

Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

Fishery Name_____ Water Body_____ Flow_____cfs

Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

FOOD CHAIN INDIVIDUAL

7. ACTUAL CONTAMINATION FISHERIES:

If analytical evidence indicates that a fishery has been exposed to a hazardous substance with a bioaccumulation factor greater than or equal to 500 (SI Table 10), assign a score of 50 if there is a Level I fishery. Assign 45 if there is a Level II fishery, but no Level I fishery.

8. POTENTIAL CONTAMINATION FISHERIES:

If there is a release of a substance with a bioaccumulation factor greater than or equal to 500 to a watershed containing fisheries within the target distance limit, but there are no Level I or Level II fisheries, assign a score of 20.

If there is no observed release to the watershed, assign a value for potential contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit:

| Lowest Flow | FCI Value |
|---|---|
| <10 cfs | 20 |
| 10 to 100 cfs | 2 |
| >100 cfs, coastal tidal waters, oceans, or Great Lakes | 0 |
| 3-mile mixing zone in quiet flowing river | 10 |

**FCI Value =**

**SUM OF TARGETS T =** 0

## SURFACE WATER PATHWAY (continued)
## ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

| ENVIRONMENTAL THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of 0 at the bottom of the page. | | | |

| Environment Name | Water Body Type | Flow |
|---|---|---|
| | | cfs |
| | | cfs |
| | | cfs |
| | | cfs |
| | | cfs |

9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table 11, and assign a factor value for the environment (SI Tables 13 and 14).

| Environment Name | Environment Type and Value (SI Tables 13 & 14) | Multiplier (10 for Level I, 1 for Level II) | Product |
|---|---|---|---|
| | | x = | |
| | | x = | |
| | | x = | |
| | | x = | |
| | | Sum = | |

Score: 0 | Data Type: | Refs: 9, 10

10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:

| Flow | Dilution Weight (SI Table 12) | Environment Type and Value (SI Tables 13 & 14) | Pot. Cont. | Product |
|---|---|---|---|---|
| cfs | x | x | 0.1 = | |
| cfs | x | x | 0.1 = | |
| cfs | x | x | 0.1 = | |
| cfs | x | x | 0.1 = | |
| cfs | x | x | 0.1 = | |
| | | | Sum = | |

T = 0

## SI TABLE 12 (HRS Table 4-13): SURFACE WATER DILUTION WEIGHTS

| Type of Surface Water Body | | Assigned Dilution Weight |
|---|---|---|
| **Descriptor** | **Flow Characteristics** | |
| Minimal stream | < 10 cfs | 1 |
| Small to moderate stream | 10 to 100 cfs | 0.1 |
| Moderate to large stream | > 100 to 1,000 cfs | 0.01 |
| Large stream to river | > 1,000 to 10,000 cfs | 0.001 |
| Large river | > 10,000 to 100,000 cfs | 0.0001 |
| Very large river | > 100,000 cfs | 0.00001 |
| Coastal tidal waters | Flow not applicable; depth not applicable | 0.001 |
| Shallow ocean zone or Great Lake | Flow not applicable; depth less than 20 feet | 0.001 |
| Moderate depth ocean zone or Great Lake | Flow not applicable; depth 20 to 200 feet | 0.0001 |
| Deep ocean zone or Great Lake | Flow not applicable; depth greater than 200 feet | 0.000005 |
| 3-mile mixing zone in quiet flowing river | 10 cfs or greater | 0.5 |

## SI TABLE 13 (HRS TABLE 4-23): SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

| SENSITIVE ENVIRONMENT | ASSIGNED VALUE |
|---|---|
| Critical habitat for Federal designated endangered or threatened species<br>Marine Sanctuary<br>National Park<br>Designated Federal Wilderness Area<br>Ecologically important areas identified under the Coastal Zone Wilderness Act<br>Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act<br>Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes)<br>National Monument (air pathway only)<br>National Seashore Recreation Area<br>National Lakeshore Recreation Area | 100 |
| Habitat known to be used by Federal designated or proposed endangered or threatened species<br>National Preserve<br>National or State Wildlife Refuge<br>Unit of Coastal Barrier Resources System<br>Coastal Barrier (undeveloped)<br>Federal land designated for the protection of natural ecosystems<br>Administratively Proposed Federal Wilderness Area<br>Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary<br>Migratory pathways and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time<br>Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding<br>National river reach designated as recreational | 75 |
| Habitat known to be used by State designated endangered or threatened species<br>Habitat known to be used by a species under review as to its Federal endangered or threatened status<br>Coastal Barrier (partially developed)<br>Federally designated Scenic or Wild River | 50 |
| State land designated for wildlife or game management<br>State designated Scenic or Wild River<br>State designated Natural Area<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |
| State designated areas for the protection of maintenance of aquatic life under the Clean Water Act | 5 |
| Wetlands See SI Table 14 (Surface Water Pathway) or SI Table 23 (Air Pathway) | 25 |

8

## SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

| Total Length of Wetlands | Assigned Value |
|---|---|
| Less than 0.1 mile | 0 |
| 0.1 to 1 mile | 25 |
| Greater than 1 to 2 miles | 50 |
| Greater than 2 to 3 miles | 75 |
| Greater than 3 to 4 miles | 100 |
| Greater than 4 to 8 miles | 150 |
| Greater than 8 to 12 miles | 250 |
| Greater than 12 to 16 miles | 350 |
| Greater than 16 to 20 miles | 450 |
| Greater than 20 miles | 500 |

# SURFACE WATER PATHWAY (concluded)

## WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

### WASTE CHARACTERISTICS

| | Score |
|---|---|
| 14. If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, assign the calculated hazardous waste quantity score, or a score of 100, whichever is greater. | |
| 15. Assign the highest value from SI Table 7 (observed release) or SI Table 3 (no observed release) for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat. | |

| | Substance Value | HWQ | Product | WC Score (from Table) (Maximum of 100) |
|---|---|---|---|---|
| Drinking Water Threat Toxicity/Persistence | x | = | | 0 |
| Food Chain Threat Toxicity/Persistence Bioaccumulation | x | = | | 0 |
| Environmental Threat Ecotoxicity/Persistence/ Ecobioaccumulation | x | = | | 0 |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 to <1E + 09 | 100 |
| 1E + 09 to <1E + 10 | 180 |
| 1E + 10 to <1E + 11 | 320 |
| 1E + 11 to <1E + 12 | 560 |
| 1E + 12 or greater | 1000 |

### SURFACE WATER PATHWAY THREAT SCORES

| Threat | Likelihood of Release (LR) Score | Targets (T) Score | Pathway Waste Characteristics (WC) Score (determined above) | Threat Score $\frac{LR \times T \times WC}{82,500}$ |
|---|---|---|---|---|
| Drinking Water | | | | (maximum of 100) |
| Human Food Chain | | | | (maximum of 100) |
| Environmental | | | | (maximum of 60) |

**SURFACE WATER PATHWAY SCORE (Drinking Water Threat + Human Food Chain Threat + Environmental Threat)** (maximum of 100): 0

## SOIL EXPOSURE PATHWAY

If there is no observed contamination (e.g., ground water plume with no known surface source), do not evaluate the soil exposure pathway. Discuss evidence for no soil exposure pathway. ONLY TRACE OF TOLUENE IN 4 SAMPLES.

**Soil Exposure Resident Population Targets Summary**

For each property (duplicate page 35 as necessary):

If there is an area of observed contamination on the property and within 200 feet of a residence, school, or day care center, enter on Table 15 each hazardous substance by sample ID. Record the detected concentration. Obtain cancer risk, and reference dose concentrations from SCDM. Sum the cancer risk and reference dose percentages for the substances listed. If cancer risk or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the residents and students as Level I. If both percentages are less than 100% or all are N/A, evaluate the targets as Level II.

## SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# SOIL EXPOSURE PATHWAY WORKSHEET
# RESIDENT POPULATION THREAT

| LIKELIHOOD OF EXPOSURE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0. | | | |
| LE = | 0 | | |

**TARGETS**

| | | | |
|---|---|---|---|
| 2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on or within 200 feet of areas of observed contamination (HRS section 5.1.3).<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ **Sum =** | | | |
| 3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (*i.e.*, no Level I or Level II targets), assign 0 (HRS Section 5.1.3). | | | |
| 4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities with areas of observed contamination associated with the site. | | | |

| Number of Workers | Score |
|---|---|
| 0 | 0 |
| 1 to 100 | 5 |
| 101 to 1,000 | 10 |
| >1,000 | 15 |

| | | | |
|---|---|---|---|
| 5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination. | | | |

| Terrestrial Sensitive Environment Type | Value |
|---|---|
| | |
| | |
| | |
| | |
| | |

| | | | |
|---|---|---|---|
| **Sum =** | | | |
| 6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on an area of observed contamination at the site; assign 0 if none applies.<br>• Commercial agriculture<br>• Commercial silviculture<br>• Commercial livestock production or commercial livestock grazing | | | |
| **Total of Targets T=** | | | |

## SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

| TERRESTRIAL SENSITIVE ENVIRONMENT | ASSIGNED VALUE |
|---|---|
| Terrestrial critical habitat for Federal designated endangered or threatened species<br>National Park<br>Designated Federal Wilderness Area<br>National Monument | 100 |
| Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species<br>National Preserve (terrestrial)<br>National or State terrestrial Wildlife Refuge<br>Federal land designated for protection of natural ecosystems<br>Administratively proposed Federal Wilderness Area<br>Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding | 75 |
| Terrestrial habitat used by State designated endangered or threatened species<br>Terrestrial habitat used by species under review for Federal designated endangered or threatened status | 50 |
| State lands designated for wildlife or game management<br>State designated Natural Areas<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |

# SOIL EXPOSURE PATHWAY WORKSHEET
# NEARBY POPULATION THREAT

| LIKELIHOOD OF EXPOSURE | Score | Data Type | Ref. |
|---|---|---|---|
| 7. Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6) Value _____<br><br>Area of Contamination (from SI Table 18 or HRS Table 5-7) Value _____<br><br>Likelihood of Exposure (from SI Table 19 or HRS Table 5-8) | | | |
| LE = | 0 | | |

| TARGETS | Score | Data Type | Ref. |
|---|---|---|---|
| 8. Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated. | | | |
| 9. Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (*i.e.*, properties that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS Table 5-10). Sum the population values and multiply by 0.1. | | | |
| T = | | | |

## SI TABLE 17 (HRS TABLE 5-6): ATTRACTIVENESS/ACCESSIBILITY VALUES

| Area of Observed Contamination | Assigned Value |
|---|---|
| Designated recreational area | 100 |
| Regularly used for public recreation (for example, vacant lots in urban area) | 75 |
| Accessible and unique recreational area (for example, vacant lots in urban area) | 75 |
| Moderately accessible (may have some access improvements–for example, gravel road) with some public recreation use | 50 |
| Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use | 25 |
| Accessible with no public recreation use | 10 |
| Surrounded by maintained fence or combination of maintained fence and natural barriers | 5 |
| Physically inaccessible to public, with no evidence of public recreation use | 0 |

## SI TABLE 18 (HRS TABLE 5-7): AREA OF CONTAMINATION FACTOR VALUES

| Total area of the areas of observed contamination (square feet) | Assigned Value |
|---|---|
| ≤ to 5,000 | 5 |
| > 5,000 to 125,000 | 20 |
| > 125,000 to 250,000 | 40 |
| > 250,000 to 375,000 | 60 |
| > 375,000 to 500,000 | 80 |
| > 500,000 | 100 |

## SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

| AREA OF CONTAMINATION FACTOR VALUE | ATTRACTIVENESS/ACCESSIBILITY FACTOR VALUE | | | | | | |
|---|---|---|---|---|---|---|---|
| | 100 | 75 | 50 | 25 | 10 | 5 | 0 |
| 100 | 500 | 500 | 375 | 250 | 125 | 50 | 0 |
| 80 | 500 | 375 | 250 | 125 | 50 | 25 | 0 |
| 60 | 375 | 250 | 125 | 50 | 25 | 5 | 0 |
| 40 | 250 | 125 | 50 | 25 | 5 | 5 | 0 |
| 20 | 125 | 50 | 25 | 5 | 5 | 5 | 0 |
| 5 | 50 | 25 | 5 | 5 | 5 | 5 | 0 |



## SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

| Travel Distance Category (miles) | Pop. | Number of people within the travel distance category | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,001 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | |
| Greater than 0 to $\frac{1}{4}$ | 52 | 0 | 0.1 | 0.4 | 1.0 | 4 | 13 | 41 | 130 | 408 | 1,303 | 4,081 | 13,034 | 1 |
| Greater than $\frac{1}{4}$ to $\frac{1}{2}$ | 112 | 0 | 0.05 | 0.2 | 0.7 | 2 | 7 | 20 | 65 | 204 | 652 | 2,041 | 6,517 | 2 |
| Greater than $\frac{1}{2}$ to 1 | 658 | 0 | 0.02 | 0.1 | 0.3 | 1 | 3 | 10 | 33 | 102 | 326 | 1,020 | 3,258 | |

Reference(s) 4

Sum = 3

# SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

## WASTE CHARACTERISTICS

| | |
|---|---|
| 10. Assign the hazardous waste quantity score calculated for soil exposure | |
| 11. Assign the highest toxicity value from SI Table 16 | |
| 12. Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: | WC = |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

**RESIDENT POPULATION THREAT SCORE:** LE = 0

(Likelihood of Exposure, Question 1;
Targets = Sum of Questions 2, 3, 4, 5, 6)

$$\frac{LE \times T \times WC}{82{,}500}$$

**NEARBY POPULATION THREAT SCORE:** LE = 0

(Likelihood of Exposure, Question 7,
Targets = Sum of Questions 8, 9)

$$\frac{LE \times T \times WC}{82{,}500}$$

**SOIL EXPOSURE PATHWAY SCORE:**
**Resident Population Threat + Nearby Population Threat**

0
(Maximum of 100)

## AIR PATHWAY

### Air Pathway Observed Substances Summary Table

On SI Table 21, list the hazardous substances detected in air samples of a release from the site. Include only those substances with concentrations significantly greater than background levels. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For NAAQS/NESHAPS benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate targets in the distance category from which the sample was taken and any closer distance categories as Level I. If the percentages are less than 100% or all are N/A, evaluate targets in that distance category and any closer distance categories that are not Level I as Level II.

## SI TABLE 21: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References_____

| Hazardous Substance | Conc. (µg/m³) | Gaseous Particulate | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| N/A | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References_____

| Hazardous Substance | Conc. (µg/m³) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References_____

| Hazardous Substance | Conc. (µg/m³) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# AIR PATHWAY WORKSHEET

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to air, assign a score of 550. Record observed release substances on SI Table 21. | | | |
| 2. POTENTIAL TO RELEASE: If sampling data do not support a release to air, assign a score of 500. Optionally, evaluate air migration gaseous and particulate potential to release (HRS Section 6.1.2). | 500 | | |
| LR = | 500 | | |

| TARGETS | | | |
|---|---|---|---|
| 3. ACTUAL CONTAMINATION POPULATION: Determine the number of people within the target distance limit subject to exposure from a release of a hazardous substance to the air.<br>a) Level I: _____ people x 10 = _____<br>b) Level II: _____ people x 1 = _____ Total = | | | |
| 4. POTENTIAL TARGET POPULATION: Determine the number of people within the target distance limit not subject to exposure from a release of a hazardous substance to the air, and assign the total population score from SI Table 22. Sum the values and multiply the sum by 0.1. | 5.7 | | 4 |
| 5. NEAREST INDIVIDUAL: Assign a score of 50 if there are any Level I targets. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Population exists, assign the Nearest Individual score from SI Table 22. | 2 | | |
| 6. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (SI Table 13) and wetland acreage values (SI Table 23) for environments subject to exposure from the release of a hazardous substance to the air. | | | |
| 7. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release. | 1.015 | | |
| 8. RESOURCES: Assign a score of 5 if one or more air resources apply within 1/2 mile of a source; assign a 0 if none applies.<br>• Commercial agriculture<br>• Commercial silviculture<br>• Major or designated recreation area | 0 | | |
| T = | 8.715 | | |

| *Sensitive Environment Type* | *Value* |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

| *Wetland Acreage* | *Value* |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

## SI TABLE 22 (From HRS TABLE 6-17): VALUES FOR POTENTIAL CONTAMINATION AIR TARGET POPULATIONS

| Distance from Site | Pop. | Nearest Individual (choose highest) | Number of People within the Distance Category | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | |
| On a source | 0 | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | |
| 0 to $\frac{1}{4}$ mile | 52 | * | 1 | 4 | 13 | 41 | 131 | 408 | 1,304 | 4,081 | 13,034 | 40,812 | 130,340 | 408,114 | 13 |
| $>\frac{1}{4}$ to $\frac{1}{2}$ mile | 112 | 2 | 0.2 | 0.9 | 3 | 9 | 28 | 88 | 282 | 882 | 2,815 | 8,815 | 28,153 | 88,153 | 9 |
| $>\frac{1}{2}$ to 1 mile | 658 | 1 | 0.06 | 0.3 | 0.9 | 3 | 8 | 26 | 83 | 261 | 834 | 2,612 | 8,342 | 26,119 | 8 |
| > 1 to 2 miles | 2232 | 0 | 0.02 | 0.09 | 0.3 | 0.8 | 3 | 8 | 27 | 83 | 266 | 833 | 2,659 | 8,326 | 8 |
| > 2 to 3 miles | 3330 | 0 | 0.009 | 0.04 | 0.1 | 0.4 | 1 | 4 | 12 | 38 | 120 | 375 | 1,199 | 3,755 | 12 |
| >3 to 4 miles | 3372 | 0 | 0.005 | 0.02 | 0.07 | 0.2 | 0.7 | 2 | 7 | 28 | 73 | 229 | 730 | 2,285 | 7 |
| | **Nearest Individual =** | 2 | | | | | | | | | | | | **Sum =** | 57 |

**References** 4

* Score = 20 if the Nearest Individual is within $\frac{1}{8}$ mile of a source; score = 7 if the Nearest Individual is between $\frac{1}{8}$ and $\frac{1}{4}$ mile of a source.

## SI TABLE 23 (HRS TABLE 6-18): AIR PATHWAY VALUES FOR WETLAND AREA

| Wetland Area | Assigned Value |
|---|---|
| < 1 acre | 0 |
| 1 to 50 acres | 25 |
| > 50 to 100 acres | 75 |
| > 100 to 150 acres | 125 |
| > 150 to 200 acres | 175 |
| > 200 to 300 acres | 250 |
| > 300 to 400 acres | 350 |
| > 400 to 500 acres | 450 |
| > 500 acres | 500 |

## SI TABLE 24: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS

| Distance | Distance Weight | Sensitive Environment Type and Value (from SI Tables 13 and 20) | Product |
|---|---|---|---|
| On a Source | 0.10 | x 25 x 0 | 0 |
| | | x | |
| 0 to 1/4 mile | 0.025 | x 25 x 1 | |
| | | x | .625 |
| | | x | |
| 1/4 to 1/2 mile | 0.0054 | x 25 x 2 | .27 |
| | | x | |
| | | x | |
| 1/2 to 1 mile | 0.0016 | x 25 x 3 | .12 |
| | | x | |
| | | x | |
| 1 to 2 miles | 0.0005 | x | |
| | | x | |
| | | x | |
| 2 to 3 miles | 0.00023 | x | |
| | | x | |
| | | x | |
| 3 to 4 miles | 0.00014 | x | |
| | | x | |
| | | x | |
| > 4 miles | 0 | x | |

**Total Environments Score =** 1.015

## AIR PATHWAY (concluded)

### WASTE CHARACTERISTICS

| | |
|---|---|
| 9. If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculated HWQ score for sources available to air migration. | 10 |
| 10. Assign the highest air toxicity/mobility value from SI Table 21. | 0 |
| 11. Multiply the air pathway toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: | WC = 0 |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

**AIR PATHWAY SCORE:** $\frac{LE \times T \times WC}{82,500}$ = 0 (maximum of 100)

$$\frac{500 \times 8.715 \times 0}{82,500} = 0$$

**SITE SCORE CALCULATION**

| | S | $S^2$ |
|---|---|---|
| GROUND WATER PATHWAY SCORE ($S_{GW}$) | 0 | 0 |
| SURFACE WATER PATHWAY SCORE ($S_{SW}$) | 0 | 0 |
| SOIL EXPOSURE ($S_S$) | 0 | 0 |
| AIR PATHWAY SCORE ($S_A$) | 0 | 0 |
| SITE SCORE $\sqrt{\frac{S_{GW}^2+S_{SW}^2+S_S^2+S_A^2}{4}}$ = | | |

**COMMENTS**

SAMPLE DATA AND EVALUATION OF CONTAMINANT PATHWAYS AND TARGETS INDICATE A LOW POTENTIAL THAT HUMAN HEALTH AND THE ENVIRONMENT ARE BEING ADVERSELY AFFECTED BY THIS SITE. ADDITIONAL SITES IN THE AREA ARE BEING INVESTIGATED FOR PROBABLE SOURCE OF CONTAMINANT.

DRAFT

# SITE INSPECTION SAMPLING AND ANALYSIS PLAN

## FORMER COTTON SEED OIL MILL

## FORT VALLEY, GEORGIA 31030

September 25, 1997

Prepared By:

**Georgia Department of Natural Resources**
**Environmental Protection Division**
**Hazardous Waste Management Branch**

Prepared By:

Faney L.H. Foster
Environmental Engineer

Approved By:

Charles D. Williams

Derrick Williams
Program Manager I

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# TABLE OF CONTENTS


**SECTION NUMBER** ..... **PAGE**

1. Introduction ..... 3

2. Site Description ..... 3

   2.1 Location ..... 3
   2.2 Site Description ..... 3
   2.3 Operational History and Waste Characteristics ..... 3

3. Collection of Non-Sampling Data ..... 4

4. Sampling Activities ..... 4

   4.1 Source/Soil Sampling ..... 4
   4.2 Quality Assurance/Quality Control Procedures ..... 4
   4.3 Field Activities ..... 4

5. Investigation Derived Wastes Plan ..... 4

6. Project Management ..... 5

   6.1 Field Equipment/Health and Safety ..... 5
   6.2 Community Relations ..... 5
   6.3 Project Schedule ..... 5

References ..... 6

Figure 1: Site Location Map: U.S. Geologic Survey, 7.5 minute topographic quadrangle maps of Georgia
Figure 2: Site Layout and Proposed Sampling Map - Locations

Table 1 Site Sample Plan

Appendix A: Equipment List ..... 7

Appendix B: Site Safety Checklist ..... 7-A

DRAFT

## 1.0 INTRODUCTIO

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Reauthorization Act of 1986 (SARA), the Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch will conduct a site investigation (SI) at the Former Cotton Seed Oil Mill in Peach County, Georgia. The scope of this investigation will include the sampling of various environmental media to investigate the possible migration of hazardous substances from the site and to determine types and concentrations of hazardous substances present on site.

## 2.0 SITE DESCRIPTION, OPERATIONAL HISTORY AND WASTE CHARACTERISTICS

### 2.1 Location

Former Cotton Seed Oil Mill was located on what is now a vacant lot on Camellia Boulevard (SR 49) just north of College Street and east of Miller Street in Peach County. The geographic coordinates are 32° 33' 06.5" north latitude and 083° 53' 12.7" west longitude as shown on the United States Geological Survey (U.S.G.S.) Quadrangle Topographical Map, ( Reference 1. **Figure 1**).

To reach the site from Atlanta, take I-75 South through Macon and exit at SR 49 (exit #46) to the right in Peach County. Fort Valley is approximately 10 miles southwest of I-75 on SR 49.

The area is characterized by a warm and humid climate with long, hot summers and short, mild winters. The average rainfall is about 48 inches per year. March and July are normally the wettest months, each averaging more than five inches of rainfall. Fall is the driest part of the year, but no month has an average of less than two inches of rainfall (Soil Survey, 1967).

### 2.2 Site Description

The site was located on what is now a vacant city block in Fort Valley, Peach County, Georgia. The property is rectangular in shape and relatively flat. It contained a cotton seed oil mill, cotton warehouse and knitting mill.

### 2.3 Operational History and Waste Characteristics

The cotton seed oil mill, cotton warehouse and knitting mill were operational until the late 1920's. Since that time, the vacant building was damaged by a tornado in 1975 and later torn down in 1979.

The former Cotton Seed Oil Mill is being considered for a SI because perchloroethylen(PCE) has been detected above detection limits in the Fort Valley Municipal Water Supply Wells 1 and 2 located approximately 500 feet and 600 feet from the site, respectively . Although the use of PCE has not been verified at this site, the area of this site would be an optimum hydrologic location for a release of PCE to impact both city Wells 1 and 2 as well as monitoring well MW-4T next to the Anthoine Machine Works. This site is within the wellhead protection area of Municipal Wells 1 and 2.

## 3.0 COLLECTION OF NON-SAMPLING DATA

Non-sampling data collection activities will include verifying population and environmental information as well as obtaining new information. A reconnaissance survey performed on August 28, 1997 confirmed the location of Fort Valley Municipal Wells #1 and #2 and various site features. Additional data will be gathered as necessary.

## 4.0 SAMPLING ACTIVITIES

The objectives of the SI are to collect analytical data used to identify hazardous substances at the site, to investigate whether hazardous substances have been released to the environment, and to ascertain if any releases have impacted human health and the environment , according to the EPA Site Investigation score sheets. The proposed sampling plan calls for soil sampling. **Table 1** presents the sample numbers, description, and objective. Sampling locations are presented in **Figure 2**.

### 4.1 Source/Soil Sampling

Since the area of the site would be an optimum hydrologic location for a release of PCE to impact both city Wells 1 and 2 as well as monitoring well MW-4T next to the Anthoine Machine Work, the soil at the site is considered as a potential source of contamination:

1) Two subsurface soil samples will be collected. One will be in the middle of the site(**sample #1**) and the other in the soil adjacent to the property and Railroad Street (**sample #2**).

### 4.4 Quality Assurance/Quality Control Procedures (QA/QC)

All sample collection, preservation and chain of custody procedures utilized during sampling activities will be in accordance with the standard operating guidelines specified in the U.S. EPA Environmental Compliance Branch SOP/QA Manual (2/1/91) sections 3 and 4. All on-site environmental media samples will be collected with dedicated sampling equipment. No decontamination of sampling equipment will be necessary between samples. New equipment will be used for each of the samples. All samples will be stored in coolers on ice until they reach the laboratory. Chain of custody will be maintained by the project manager until samples are hand delivered to the GAEPD laboratory located in Atlanta, Georgia.

### 4.5 Field Activities

Soil samples will be taken in 8 oz containers. Proposed sample locations are shown in **Figure 2**

## 5.0 INVESTIGATION DERIVED WASTES

Investigation derived wastes include personal protective equipment.

## 6.0 PROJECT MANAGEMENT

The project manager for the area of Fort Valley Municipal Wells 1 and 2 is Steve White. He will schedule field activities and personnel requirements, verify site access authority, and direct/oversee all field tasks. The sampling, documentation and managing of all collected samples at the Former Cotton Seed Oil Mill will be done by Faney Foster.

### 6.1 Field Equipment

Ambient air safety monitoring equipment will not be necessary on-site. Environmental media sampling activities will be conducted in level D personal protection equipment including disposable gloves, work boots, and regular cotton work clothes. Other items required for this investigation, including sampling equipment, are included in Appendix A: Equipment List.

### 6.2 Community Relations

No problems have been encountered in prior investigations, and none are anticipated.

### 6.3 Project Schedule

Non-sampling data collection began in December, 1996 and will continue through November, 1997. When the field activities are completed, preparation of the draft SI narrative report will begin. Analytical results will be validated and the final SI report will be completed.

## REFERENCES

1. White,Steve, Fort Valley Municipal Wells 1 and 2; Preliminary Assessment of Potential Sources of Contamination, June 3, 1997

## SITE INSPECTION SAMPLE PLAN

**Table 1**

| SAMPLE | LOCATION | DESCRIPTION | OBJECTIVE |
|---|---|---|---|
| **sample#1** | I | subsurface soil sample | to determine source |
| **sample#2** | II | subsurface soil sample | to determine source |

*** One background sample will be taken for all Fort Valley Sites**

# SITE INSPECTION SAMPLE PLAN

## Appendix A: Equipment List

**Sample Equipment:**

| | |
|---|---|
| 4 | 8 oz glass containers (VOC-2 soil samples, 2 extra) |
| 1 | large ice chest for sample preservation |
| 1 | box plastic zip lock bags for sample bottles and vials |
| 1 | box latex gloves |
| 4 | sample tags (2 for samples, 2 extras) |
| 1 | chain of custody forms |
| 1 | box of garbage bags |
| 1 | camera with film |
| 3 | sampling spoons |
| 1 | water level tape |
| 1 | auger |
| 2 | indelible markers for sample identification |
| 1 | box/roll of paper towels |
| 1 | sprayer filled with 2-2 1/2 gallons deionized water for decontamination of measuring tape |
| 1 | trip blanks supplied by GEPD laboratory |
| 2 | spool/reel of nylon rope for bailers |
| 2 | plastic bailers |

## Appendix B

**SITE SAFETY CHECKLIST:**

**Site Name:** Former Cotton Seed Oil Mill
**Address:** Peach County, Fort Valley, Georgia

**Type Of Investigation:** Site Inspection (SI)

**Personnel Log:**

| NAME | RESPONSIBILITY | ACKNOWLEDGMENT OF FAMILIARITY WITH SITE SAFETY PLAN* (INITIAL) | SUPERVISOR APPROVAL |
|---|---|---|---|
| Faney Foster | Project Manager | | |
| Steve White | Environmental Specialist/Sampling Assistant | | |
| Thomas Williams | Engineer/GeoProbe Operator | | |
| Bob Pierce | Geologist/Sampling Assistant | | |

*SITE SAFETY PLAN CONSISTS OF THIS AND ALL ATTACHED PAGES.

| EMERGENCY AND HAZARD INFORMATION | DESCRIPTION |
|---|---|
| **SPECIAL ACCESS REQUIREMENTS:** | none |
| **EMERGENCY PHONE NUMBERS:** | 911 system in this area |
| **POTENTIAL HAZARDS DESCRIPTION:** | uneven terrain, insect bites, snakes, volatile organic compounds (potential) |
| **PERSONAL PROTECTIVE EQUIPMENT (PPE) TO BE UTILIZED:** | steel-toe boots, hard hat, safety glasses, latex gloves (when sampling) and hearing protection (if necessary) |

## GENERAL INFORMATION

FACILITY NAME: FORMER COTTON SEED OIL MILL CONTACT _____

DIRECTIONS TO FACILITY: (Attach map if possible)

I-75 S TO EXIT #46 (RT), 10 MILES TO FORT VALLEY

SPECIAL ACCESS REQUIREMENTS: NONE

## EMERGENCY INFORMATION

AMBULANCE: PEACH COUNTY EMS TELEPHONE: 825-2616
HOSPITAL: PEACH REGIONAL MEDICAL CENTER TELEPHONE: 825-8691
POLICE: PEACH COUNTY TELEPHONE: 825-3382
FIRE DEPARTMENT: PEACH COUNTY TELEPHONE: 825-5190
SITE/FIRE EVACUATION SIGNALS: _____

## INFORMATION SOURCES

PART B: _____ STATE: _____ CONTINGENCY PLAN: _____
ESD: _____ RFA: _____ CLOSURE PLAN: _____
QUESTIONNAIRE: _____ PART A: _____ OTHER: _____

## PERMITS

HAZARDOUS WASTE: _____ STATUS _____
WATER: _____ AIR: _____ OTHER: _____

## SUMMARY OR REGULATED UNITS AND SWMUS: (Indicate number of units)

LANDFILLS: _____ INCINERATORS: _____ STORAGE AREAS: _____
WASTE PILES: _____ OTHER TREATMENT: _____ OTHER: _____
SURFACE IMPROVEMENTS: _____ TANK FARMS: _____ SWMUS: _____

## FACILITY PROCESS DESCRIPTION

_____

PREVIOUS RELEASES/ACCIDENTS OR COMPLAINTS: (Corrected? YES/NO)

AIR _____ N/S

SOIL _____

SURFACE WATER _____

INDUSTRIAL ACCIDENTS _____

COMPLAINTS _____

HEALTH AND SAFETY HAZARDS

Briefly indicate hazard type. Attach additional pages if necessary.

EXPLOSION/OXYGEN DEFICIENCY HAZARDS: NONE (Circle if applicable)

RADIATION HAZARDS: NONE (Circle if applicable)

TOXIC HAZARDS: NONE (Circle if applicable)

Briefly summarize chemicals handled on site. Add attachment if necessary. Indicate if these exist in a controlled state. Refer to Part A Application if list is extensive.

UNUSUAL PHYSICAL HAZARDS: NONE (Circle if applicable)

UNUSUAL BIOLOGICAL HAZARDS: NONE (Circle if applicable)

CHECK IF PROBLEM EXPECTED: NOISE____ HEAT STRESS____ COLD STRESS____

OVERALL HAZARD RATING: (CIRCLE ONE)

| VERY HIGH | HIGH | MEDIUM | LOW |
|---|---|---|---|
| (LEVEL A) | (LEVEL B) | (LEVEL C) | (LEVEL D) |
| ASSISTANCE NECESSARY) | (ASSISTANCE NECESSARY) | (MONITORING REQUIRED) | |

## PERSONNEL PROTECTIVE EQUIPMENT

(List equipment needed in addition to safety glasses, hard hat, and steel toed boots)

| | Check if Needed | | Needed throughout entire facility? (If no, list area(s) or task(s) where needed |
|---|---|---|---|
| **HEAD AND EYE** | | | |
| FACE SHIELD | | | |
| GOGGLES | ✓ | | |
| NOISE PROTECTION | | | |
| OTHER | | | |
| **RESPIRATORY:** | | TYPE | |
| APR | | N/A | |
| APR CARTRIDGE | | | |
| ESCAPE MASK | | | |
| OTHER | | | |
| **CLOTHING:** | | | |
| TYVEK COVERALL | | | |
| SARANEX COVERALL | | | |
| COTTON COVERALL | | | |
| SPLASH SUIT | | | |
| OVERBOOTS | | | |
| RAIN GEAR | | | |
| OTHER | ✓ | SAFETY BOOTS | |
| **MISCELLANEOUS:** | | | |
| | | | |
| | | | |
| | | | |

| LEVEL A OR B NEEDED? | | Contractor or ESD? | Areas/tasks where needed |
|---|---|---|---|
| LEVEL A | N/A | | |
| LEVEL B | | | |

| IR MONITORING TYPE | | Conducted by | | Areas/tasks where needed |
|---|---|---|---|---|
| TOXIC | N/A | FACILITY | | |
| EXPLOSIVE/OXYGEN | | ESD | | |
| RADIATION | | OTHER | | |
| ZONE | | OTHER | | |

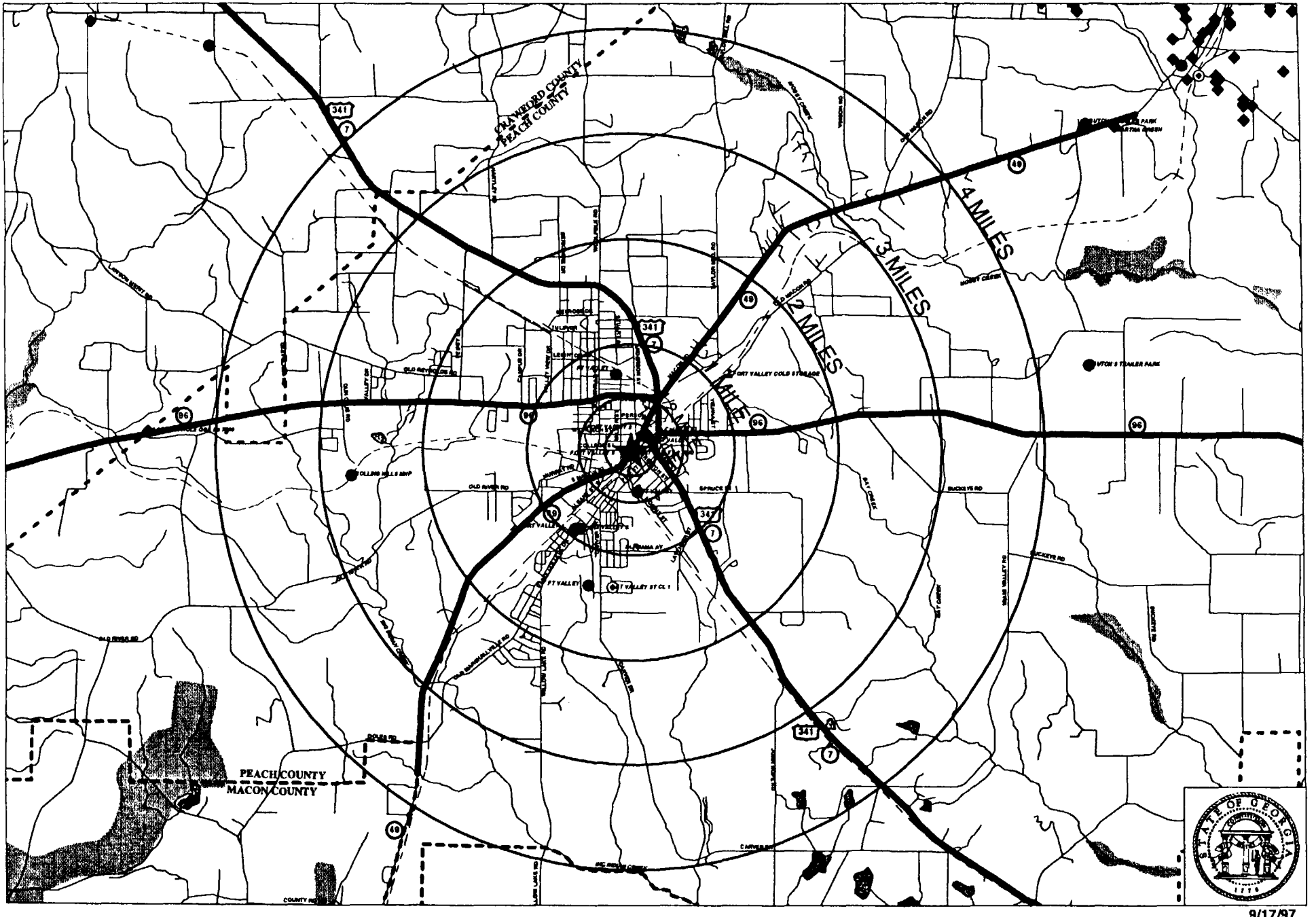


Fig 1

9/17/97

- Site Location
- Public Supply Well
- Surface Water Intake
- Domestic Well
- Unused Well
- Spring
- Industrial Well
- Commercial Well
- Irrigation Well
- Livestock well
- Well - Unknown use
- Other Well
- County Boundary
- Road
- Major Highway
- Stream/River
- Railroad
- Wetland

# COLLEGE STREET AND STATE HIGHWAY 47 SITE
# FORT VALLEY, PEACH COUNTY

**1/4, 1/2, 1, 2, 3 and 4 MILE RADII Well Locations**

SOURCES: Georgia Public Water Source Inventory, 1994; US Census Bureau 1990; Ga. Water Source Inv., USGS, 1995

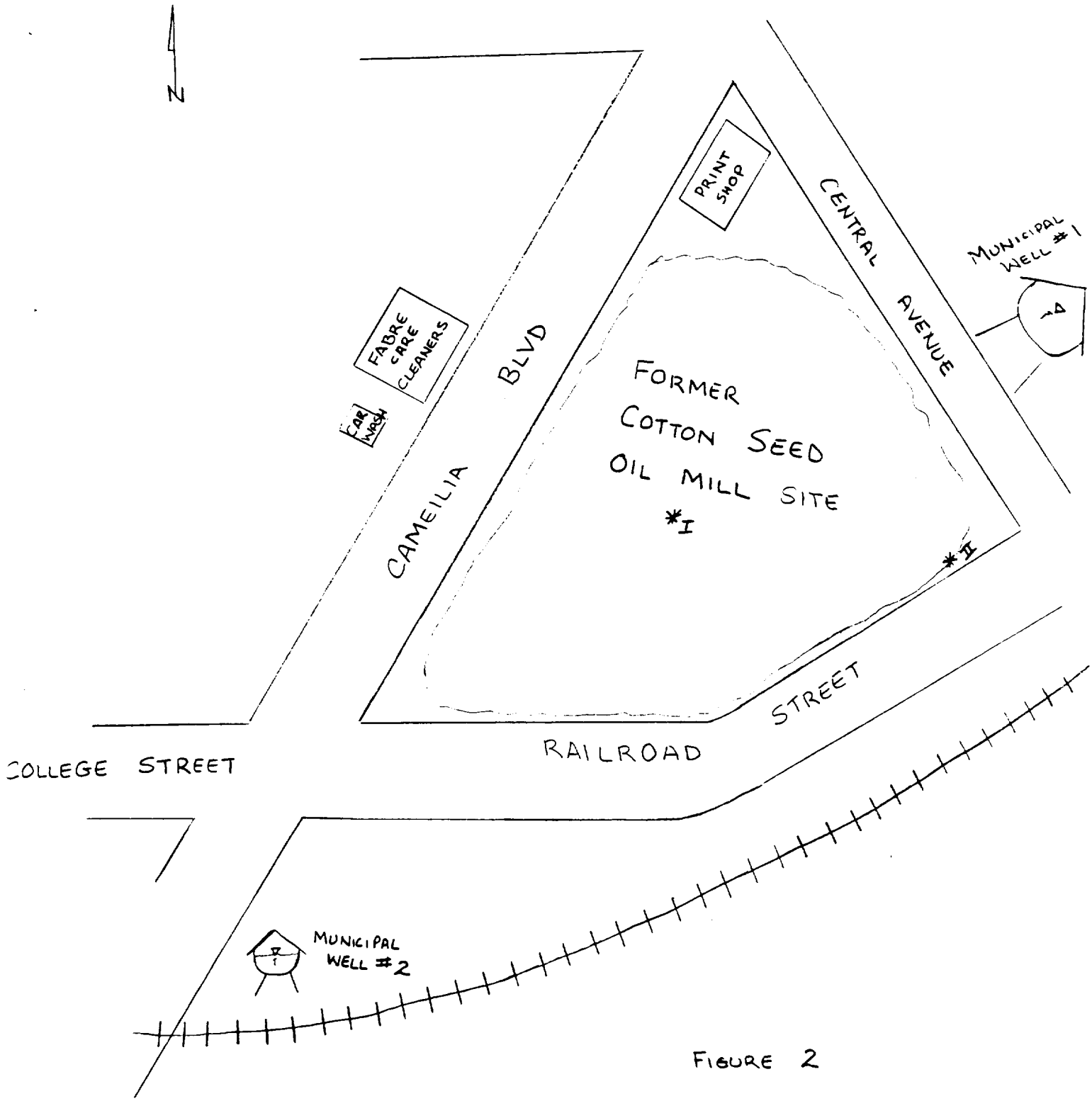


FIGURE 2

NOT TO SCALE

# REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV



**EPA ID:** GA0001020874 **Site Name:** ANTHOINE MACHINE WORKS **State ID:**

**Alias Site Names:**

**City:** FORT VALLEY **County or Parish:** PEACH **State:** GA

**Refer to Report Dated:** 01/05/98 **Report Type:** SITE INSPECTION 001

**Report Developed by:**

**DECISION:**

[X] **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**

[X] **1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)**

[ ] **1b. Site may qualify for action, but is deferred to:**

[ ] **2. Further Assessment Needed Under CERCLA:**

**2a. Priority:** [ ] **Higher** [ ] **Lower**

**2b. Other: (recommended action)**

**DISCUSSION/RATIONALE:**

There were no detected VOCs in the soils above the water table.

**Site Decision Made by:** ALAN W. YARBROUGH

**Signature:** _____ **Date:** 08/27/98

**EPA Form # 9100-3**

Received 7/8/98

# Site Inspection Narrative Report
# Anthoine Machine Works
# Peach County, Georgia
# GA0001020874


Prepared by:

Robert Pierce
Advanced Geologist


Georgia Environmental Protection Division

Hazardous Waste Management Branch

January 5, 1998


Reviewed by

Dave Yardumian
Hazardous Waste Management Branch
Georgia Environmental Protection Division

# CONTENTS


Page

1. INTRODUCTION ..... 4

2. SITE DESCRIPTION ..... 4
   - 2.1 Location ..... 4
   - 2.2 Site Description ..... 5
   - 2.3 Operational History & Waste Characteristics ..... 5

3. WASTE/SOURCE SAMPLING ..... 5
   - 3.1 Sample Locations ..... 5
   - 3.2 Analytical Results ..... 5

4. GROUND WATER PATHWAY ..... 6
   - 4.1 Hydrogeology ..... 6
   - 4.2 Targets ..... 7
   - 4.3 Sample Locations ..... 7
   - 4.4 Ground Water Conclusions ..... 7

5. SURFACE WATER PATHWAY ..... 8
   - 5.1 Hydrology ..... 8
   - 5.2 Surface Water Targets ..... 8
   - 5.3 Sample Locations ..... 8
   - 5.4 Surface Water Conclusions ..... 9

6. SOIL EXPOSURE AND AIR PATHWAY ..... 9
   - 6.1 Physical Conditions ..... 9
   - 6.2 Soil and Air Targets ..... 9
   - 6.3 Soil Sample Locations ..... 9
   - 6.4 Soil Analytical Results ..... 10
   - 6.5 Soil & Air Conclusions ..... 10

7. SUMMARY & CONCLUSIONS ..... 10

References ..... 11

Tables

Table 1: Samples taken during SI with analytical results ..... 5
Table 2: Drinking Water Populations ..... 7

Figures.....Pages 12-17

Figure 1: Fort Valley 7.5 Minute Quadrangle Map
Figure 2: Site Sketch and Sample Locations
Figure 3: Ground Water Pathway Map
Figure 4: Geologic Cross Section
Figure 5: Surface Water Pathway Map
Figure 6: Flood Hazard Map

Appendices

Appendix 1: Sampling Plan
Appendix 2: Laboratory Reports
Appendix 3: CENTRACTS Report
Appendix 4: Fort Valley Well Head Protection Plan
Appendix 5: Site Reconnaissance Trip Report
Appendix 6: Score Sheets

Date: January 5, 1998

Prepared by: Robert Pierce, Advanced Geologist
Georgia Environmental Protection Division
Hazardous Waste Management Branch
Atlanta, Georgia

Site: Anthoine Machine Works
Fort Valley, Peach County, Georgia

EPA ID No.: GA0001020874

## 1.0 INTRODUCTION

Under Authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Environmental Protection Division (EPD), Hazardous Waste Management Branch conducted a Site Investigation (SI) at the Anthoine Machine Works in Peach County, Georgia. The purpose of this investigation was to collect information concerning conditions at the Anthoine Machine Works site sufficient to assess whether this site is a source of the tetrachloroethylene found in 2 of the City of Fort Valley's 5 municipal wells and to determine the need for additional investigation under CERCLA or other authority, and, if appropriate support site evaluation using the Hazard Ranking System (HRS) for proposal to the National Priorities List (NPL). This investigation included reviewing previous formation, sampling environmental media to test Preliminary Assessment (PA) hypotheses and to evaluate and document HRS factors, collecting additional non-sampling information, and interviewing nearby residents.

## 2.0 SITE DESCRIPTION

### 2.1 Location

Anthoine Machine Works is located at 311 Railroad Street., Fort Valley, Georgia 31030. The geographic coordinates are $32^0$33'04.8" North Latitude and $83^0$53'09.3" West Longitude as can be seen on the United States Geologic Survey Fort Valley Quadrangle 7.5 minute Topographic Map (Figure 1).

Peach County is characterized by a mild climate. Summers are warm and humid with temperatures reaching 90-$100^0$F. The hottest weather usually occurs in several short periods rather than in one long continuous period. The winters are generally mild but several short periods of moderately cold weather can be expected each year. Temperatures of $32^0$F or below occur on an average of about 35 days each winter. The yearly average rainfall ranges from about 45 to 48 inches. March and July are normally the wettest months. (Reference 1).

## 2.2 Site Description

The site is located on approximately 1.34 acres of land and is operated by Mr. Steven W. Lindsey. The site is located in downtown Fort Valley and is bounded by the following properties:

North - Central of Georgia Railroad
South - Woolfolk Chemical Works
East - Open Field
West - Industrial Buildings

The site is active and machine operations are conducted there. The site currently has 5 buildings with the largest being the machine shop building, with the other 4 used for storage or work areas (Reference 10).

## 2.3 Operational History & Waste Characteristics

Anthoine Machine Works has been at the site since 1875 and from time to time a saw mill and planing mill were located at the site (Reference 12). Present waste operations were observed to be limited to parts washing at a small cleaning station with waste solvents removed by a hazardous waste transported company (Reference 11). Anthoine Machine Works is a Conditionally Exempt Small Quantity Generator (Reference 14).

# 3.0 WASTE/SOURCE SAMPLING

## 3.1 Sample Locations

Table 1 presents sample numbers, locations, and objectives for all samples collected during the SI. Four (4) soil samples were taken during this investigation. Soil samples were taken with a GeoProbe Model 5400 mounted on a pickup truck utilizing GeoProbe coring tools.

## 3.2 Analytical Results

Analytical results are presented in Table 1, along with sample number, description of the sample point and reason for sample collection. Figure 2 shows sample locations.

Table 1: Samples taken during SI with analytical results.

| Sample Number | Description | Purpose | Results Contaminant | Concentration |
|---|---|---|---|---|
| 1 | Undisturbed soil sample at west boundary of facility (12-14' BLS) | Establish background and follow VOC contamination from surface to GW | VOCs | ND |
| 2 | Undisturbed soil sample at east boundary of facility (10-12' BLS) | Follow VOC contamination from surface to GW | VOCs | ND |
| 3 | Undisturbed soil sample near SE boundary of facility (12-16' BLS | Follow VOC contamination from surface to GW | VOCs | ND |
| 4 | Undisturbed soil sample near SW boundary of facility (5-6' BLS | Follow VOC contamination from surface to GW | VOCs | ND |

## 4.0 GROUND WATER PATHWAY

### 4.1 Hydrogeology

The City of Fort Valley is located in the Fort Valley Plateau District of the Coastal Plain physiographic province. The dominant feature of the Fort Valley Plateau District is a broad, flat topped topography with fewer streams and less local relief than adjacent districts. The City of Fort Valley is located in an outcrop area of the Lower Paleocene Clayton formation which consists of sandy brick-red clay and fine to coarse grained sand. The Clayton formation is underlain by the Providence Sand, Providence-Ripley-Cusetta, Blufftown-Eutaw, and Tuscaloosa formations. The shallow most aquifer is the Clayton (or perched) aquifer which is composed 10-35 feet of silty fine sand. The Clayton aquifer is overlain by 10-15 feet of soil and a sandy clay unit, and underlain by an aerially extensive kaolin layer which ranges in thickness from 2-20 feet. Ground water in the Clayton aquifer is under water table conditions, and depth to ground water in this aquifer is approximately 25-30 feet below land surface. The deepest aquifer in Fort Valley is the Tuscaloosa aquifer which occurs at a depth of about 250 feet below land surface. This aquifer is overlain by the Ripley/Blufftown - Eutaw

semiconfining unit and ground water in the Tuscaloosa aquifer occurs under confined conditions. The Tuscaloosa aquifer is the primary source of ground water to the high capacity wells in the area including Fort Valley City wells 1, 2 and 5 (References 2 and 3).

## 4.2 Targets

Table 2 presents the number of people on public and private water sources within 1/2, 2, 3, and 4 miles of the site (Reference 4 and Figure 3). Most people within four (4) miles of the site obtain their drinking from public water systems using wells. The remainder use private wells. There are no public or private public water systems using surface water within 15 miles of the site. The City of Fort Valley is the largest supplier of drinking water in the area. The City system has 5 wells which pump to two treatment plants. Wells 1, 2, and 5 pump to the McLean plant which is downtown and wells 3 & 4 pump to the Jones Plant which is in the SW part of the City near Fort Valley State College. These plants are tied together by a common distribution system so there is only one City of Fort Valley Public water system (Reference 15).

Table 2 Drinking Water Population

| Ground Water Usage | Distance from Site (Miles) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0-0.25 | 0.25-0.50 | 0.5-1.0 | 1.0-2.0 | 2.0-3.0 | 3.0-4.0 | Total |
| Total Population | 68 | 114 | 573 | 2309 | 3308 | 2977 | 9349 |
| Population on Private Wells | 3 | 09 | 33 | 225 | 393 | 436 | 1099 |
| Population on Public Wells | 65 | 105 | 540 | 2084 | 2915 | 2541 | 8250 |

## 4.3 Sample Locations

There are three monitoring wells on the site that were installed and sampled by a consulting firm as part of the adjacent Woolfolk Chemical Works Superfund investigation. The three monitoring wells (MW-4C, MW-21, and MW-4T) are at depths of about 20-30, 110-120, and 260-270 feet, respectively below land surface (Figure 4) (Reference 3). MW-4C showed no Perc, MW-21 showed Perc at 6.5 ug/l, and MW-4T showed Perc in the 5.2-9.9 ug/l range. These monitoring wells show a sandy clay from land surface to about 17 feet BLS, a kaolin clay layer from about 30-43 feet BLS, and a sandy clay from 55-70 feet BLS (Figure 4).

## 4.4 Ground Water Conclusions

The small amount of Perc in wells 4T and 21 cannot be attributed to the site because:

a. The intervening clay layers between the MW-4C and the MW-21 well screens would serve as a barrier to vertical Perc migration.
b. Well (4C) did not show Perc contamination.
c. The soil sampling done as part of this SI showed no Perc contamination.
d. There are multiple potential sources of Perc in the vicinity of the site.

## 5.0 SURFACE WATER PATHWAY

### 5.1 Hydrologic Setting

The site is located on a topographic plateau (Figure 1). The machine shop property is located at the intersection of Railroad and Preston Streets. With the exception of the buildings, the site is soil inside the fenced enclosure. Any overland drainage from the site flows southeast toward the Probable Point of Entry (PPE) which is an unnamed tributary of Big Indian Creek (Figure 5). The PPE is about 2 miles from the site. From the PPE, the unnamed tributary flows south about 4 miles where it joins Big Indian Creek. Big Indian Creek is a moderate size stream with an average flow rate of 86 cubic feet per second and an average low flow rate of 21 cubic feet per second (Reference 5). There has been no Flood Insurance Administration Map produced for the City of Fort Valley. However, a Flood Hazard Rate Map has been produced for the area and this map shows the site to be outside the 500-year floodplain (Figure 6 & Reference 6).

### 5.2 Surface Water Targets

There are no drinking water intakes within 15 downstream miles (Figure 5). It is likely some recreational fishing (brim and bass) occurs in the area where Bay Creek merges into Big Indian Creek just west of the City of Perry. There is limited access to this area by the public; therefore, only the people who own properties along the creeks have the opportunity to catch fish (Reference 7). The distance between the machine shop and the fishery is approximately 13 miles. There are no major wetlands located between this site and the 15 miles downstream delineation boundary (Figure 5).

Pursuant to the Georgia Endangered Wildlife Act of 1973 and the Federal Endangered Species Act of 1973, no wildlife is designated as a state and federally protected species (classified as endangered wildlife) whose range of habitats includes Peach and Houston Counties (Reference 8).

Pursuant to the Georgia Wildlife Preservation Act of 1973, Chamaecyparis thyoides (Linnaeus) Atlantic White Cedar, Nestronia umbellula (Rafinesque) Indian Olive, Sarracenia rubra (Walter) Sweet Pitcherplant and Trillium reliquum (Freeman) Relict Toadshade are designated as state protected species (classified threatened/endangered plants) whose range of habitat include Peach, Houston, Taylor, Talbot, Marion, Crawford, Muscogee, Macon and Schley Counties (Reference 9).

The above protected flora and fauna were not designated as terrestrial sensitive environments for the soil or air pathways due to the fact that none of the protected species were observed on-site or off-site during the reconnaissance.

### 5.3 Surface Water Sample Locations

No surface water samples were taken to identify a release to Big Indian Creek. Probable point of entry (PPE) was chosen for the unnamed tributary to Big Indian Creek based on the surface runoff and topography of the area.

surface runoff and topography of the area.

5.4 Surface Water Conclusions

A potential release of contaminants to surface water is not suspected because of the distance to the PPE. No drinking water intakes have been identified but a recreational fishery has been identified. The surface water pathway is not of concern.

## 6.0 SOIL EXPOSURE AND AIR PATHWAY

6.1 Physical Conditions

The site is active. The property is fenced with three (3) locking gates (Reference 10). The gate on Preston Ave was observed to be kept locked at all times. The other two (2) gates on Railroad St. are open during regular business hours but are kept locked at night.

6.2 Soil and Air Targets

No more than five (5) workers were observed at the site (Reference 10). The site is in an industrial area and is bounded to by the following:

North - Central of Georgia Railroad
South - Woolfolk Chemical Works
East - Open Field
West - Industrial Buildings

The total population within four (4) miles of the site is 9349. (Reference 4).

6.3 Soil Sample Locations

Table 1 shows the sample locations description of the samples, and the analytical results of samples taken during the site reconnaissance (Reference 10). A total of four (4) soil samples were taken at the site and analyzed for VOCs. All samples were taken within the fenced enclosure. The samples were taken at the following depths using direct push technology.

| Sample No. | Depth in feet BLS | PID Hit (Y/N) |
|---|---|---|
| 1 | 12-14 | N |
| 2 | 10-12 | N |
| 3 | 12-16 | N |
| 4 | 5-6 | N |

The purpose of these samples was to see if there was a connection between present or past activities at the site with Perc ground water contamination found in an on-site monitoring well (Well 4-C) with a screened interval of about 260-270 feet BLS (Reference 3). This well is completed in the Tuscaloosa aquifer which is also the aquifer utilized by City Wells 1 and 2.

## 6.4 Soil Analytical Results

The soil analytical results shown in Table 1 show no detectable contamination with Perc or any other VOC.

## 6.5 Conclusions

Since there were no detectable VOCs in the soils at different depth above the water table, it can be concluded that this site did not contribute VOC contamination to the ground water in the Tuscaloosa aquifer that supplies the City of Fort Valley Municipal Wells 1 and 2. Since no VOCs were detected by continuous PID monitoring (Reference 10) during the direct push sampling, it was concluded that air emissions were not a concern.

# 7.0 SUMMARY AND CONCLUSIONS

The purpose of this SI was to prove or disprove the hypothesis that the Site is or was a source of tetrachloroethylene (Perc) to the ground water flowing to the City of Fort Valley Municipal Wells 1 and 2. All soil samples at the site consisted of a red sandy clay (Reference 13). This clay corresponds to a clay layer that occurred in four monitoring wells within 1/4 mile of the site that were recently completed by the Georgia Geologic Survey (Reference 13). This clay layer extended from about 1-2 feet BLS to about 30 feet BLS where it was in contact with a kaolin clay layer. Monitoring well cluster 4C, 21 and 4T constructed as part of the Wolfolk Chemical Works NPL Investigation (Figure 4) shows a sandy clay from land surface to about 17 feet BLS, a kaolin clay layer from about 30-43 feet BLS, and a sandy clay from 55-70 feet BLS. The occurrance of these clay layers plus the fact that no Perc was detected in MW-4C (screened just above the kaolin clay layer) leads to the conclusion that the Perc contamination in City Wells 1 and 2 cannot be attributed to the Site.

The Geologic Survey and the Hazardous Waste Management Branches of the Georgia Environmental Protection Division are conducting an on going investigation into the source or sources of the Perc in Fort Valley City Wells 1 and 2 . The information from other SIs that are presently being conducted in the immediate area of City Wells 1 and 2 and the data from GSB monitoring wells presently under construction will be used to help pinpoint the source or sources.

# References


1. USDA (1977): Soil Survey of Peach and Houston Counties, Georgia.

2. Draft Remedial Investigation Report, Woolfolk Chemical Works Site-Fort Valley, Georgia, CH2M Hill, July 1992

3. Work Plan for Investigating the Relation Between PCE Found in Fort Valley Water Supply Wells and the Woolfolk Chemical Works Superfund Site, March 17, 1997.

4. Frost Associates (1997) CENTRAX Data.

5. McFarlene, Roger, U.S. Geological Survey, Phone Call (770) 903-9100, 11 December 1997.

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7. Schleger, Steve, Georgia Department of Natural Resources, Wildlife Resources Division, Fort Valley, Phone Call (912) 825-6151, 12 December 1997.

8. Odom, Ron R., Georgia's Protected Wildlife, Georgia Department of Natural Resources, Game and Fish Division, Endangered Wildlife Program, 15 September 1977.

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10. Site Reconnaissance and Sampling Trip Report.

11. December 11, 1996 EPD Geologic Survey Branch Memorandum.

12. Mr. Steven W. Lindsey, President Anthoine Machine Works, Verbal Communication.

13. Larry Papetti, Georgia Geologic Survey, Personal Communication

14. GA. EPD Files

15. Brad Addison, GA. EPD Drinking Water Program, Personal Communication.

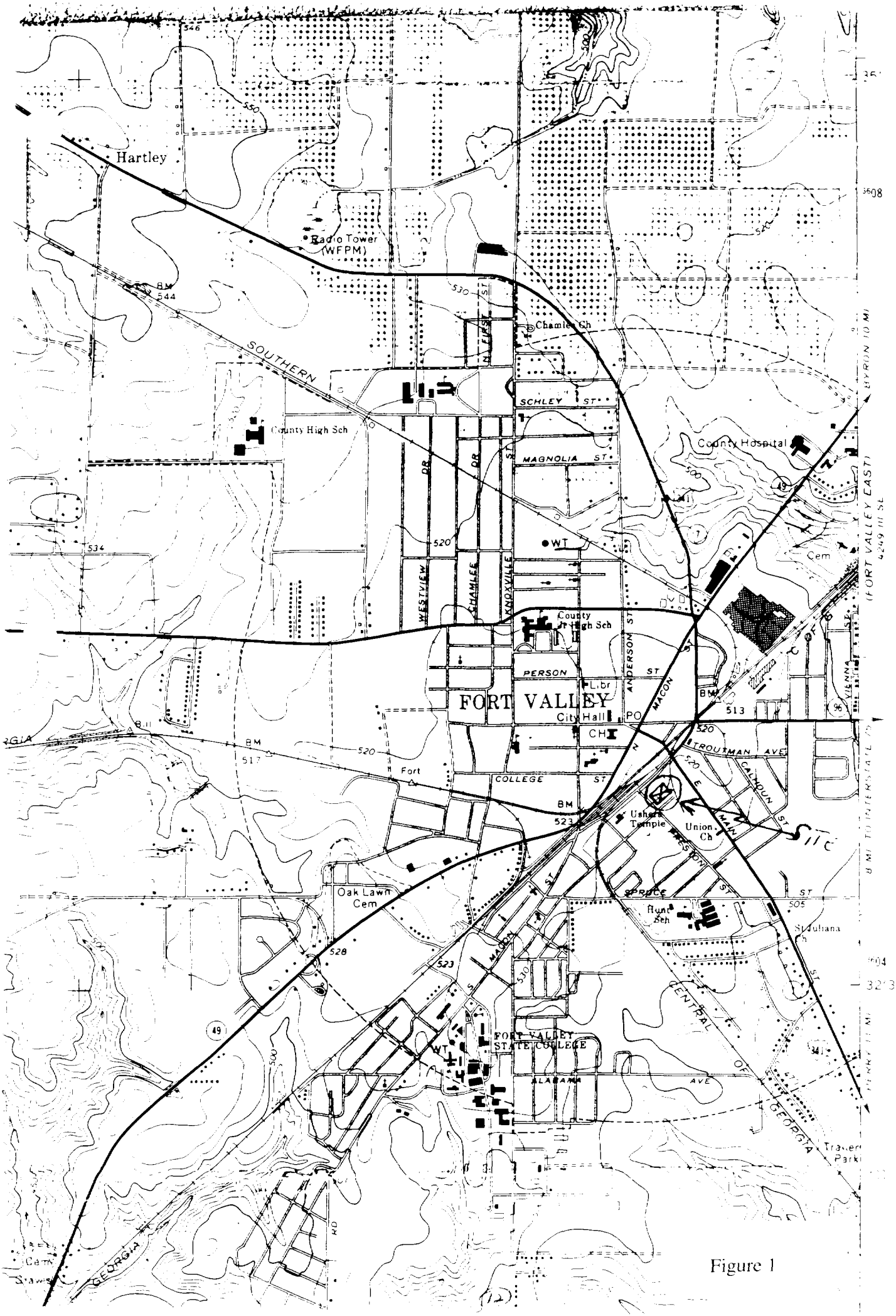

Hartley
Radio Tower (WFPM)
SOUTHERN
Chamlee Sch
SCHLEY ST
County High Sch
MAGNOLIA ST
County Hospital
WESTVIEW DR
CHAMLEE DR
KNOXVILLE ST
ANDERSON ST
MACON ST
County Jr High Sch
PERSON ST
Libr
FORT VALLEY
City Hall
PO
CH
TROUTMAN AVE
CALHOUN ST
COLLEGE ST
Fort
Usher Temple
Union Ch
MAIN ST
SPRUCE ST
Oak Lawn Cem
Hunt Sch
St Juliana
MADISON ST
FORT VALLEY STATE COLLEGE
ALABAMA AVE
CENTRAL OF GEORGIA
Traxler Park
GEORGIA
Cem
(FORT VALLEY EAST)
VIENNA
BYRON 10 MI
8 MI TO INTERSTATE 75
32°30'

Figure 1

# SITE MAP

# ANTHONINE MACHINE WORKS

# FORT VALLEY, GEORGIA

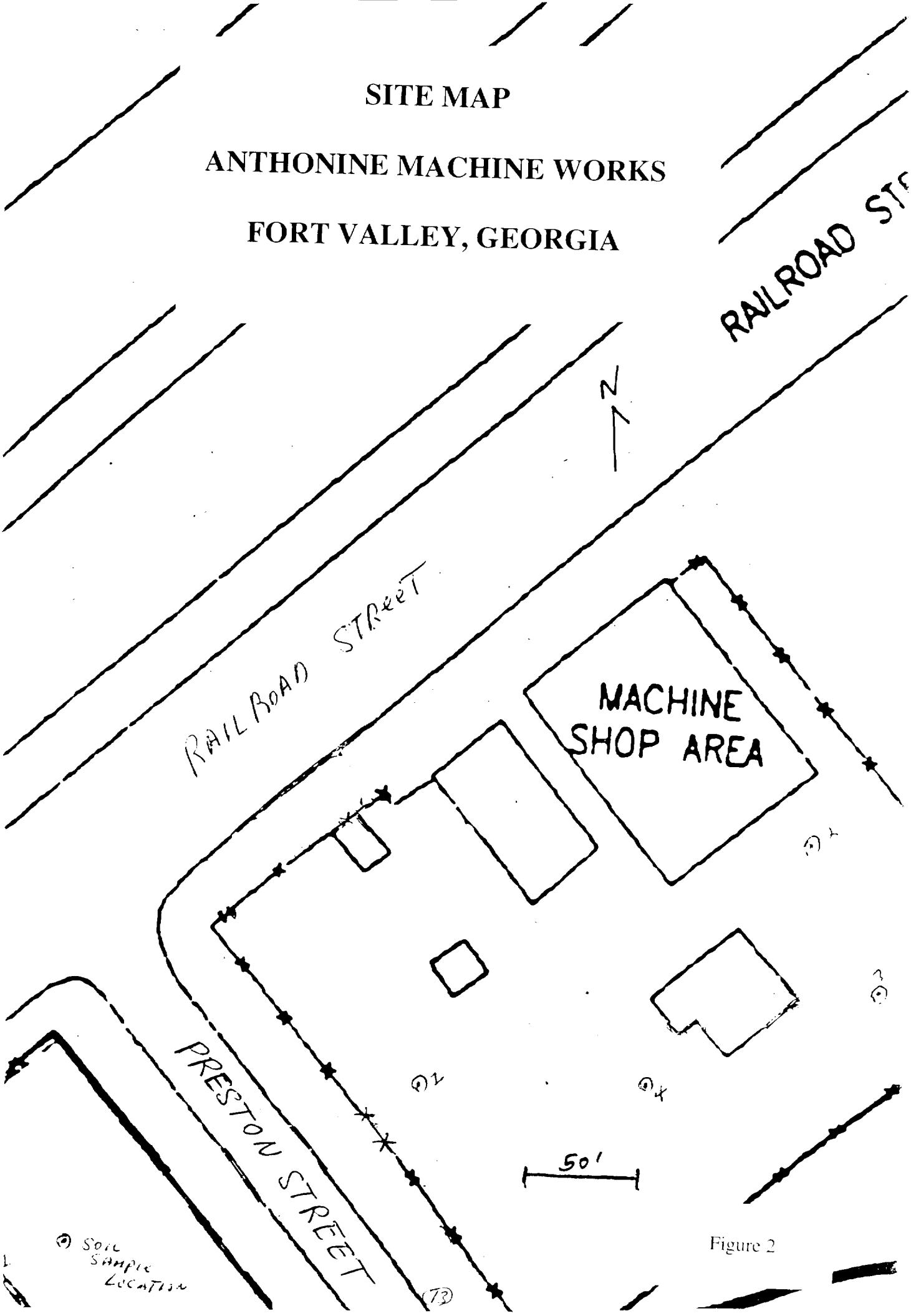
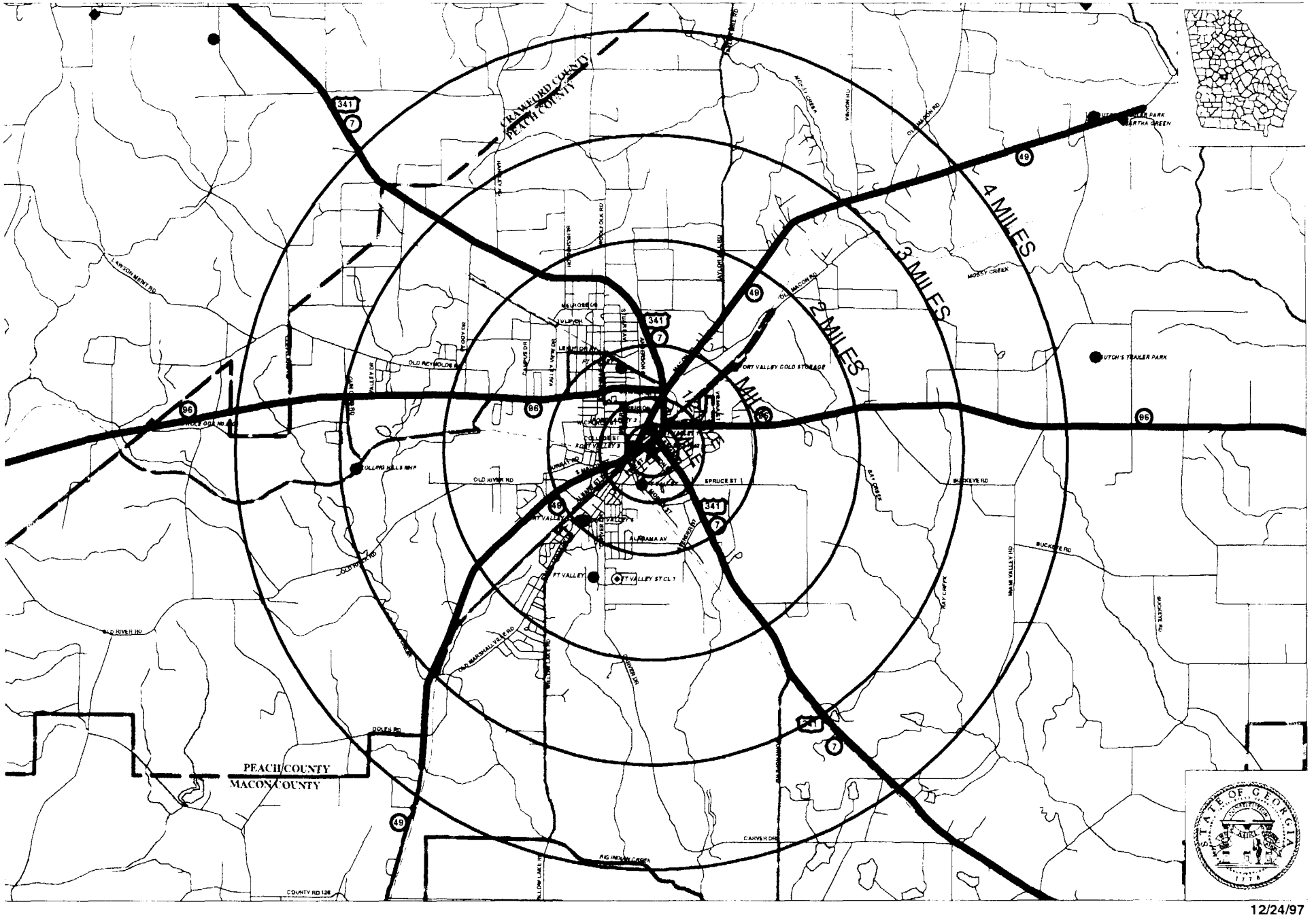



Figure 2




12/24/97

Figure 3

(14)

Census Block Group with >zero non-public supply well
Census Block Group served by public water
Public Supply Well
Surface Water Intake
Domestic
Unused W
Spring
Industrial Well
Commercial Well
Irrigation Well
Livestock well
Well - Unknown use
Other Well
County Boundary
Road
Major Highway
Stream/River
Railroad
Wetland

# ANTHOINE MACHINE WORKS
# RAILROAD STREET
# FORT VALLEY, PEACH COUNTY

**1/4, 1/2, 1, 2, 3 and 4 MILE RADII Well l ions**

**32 33' 4.8" LAT / 83 53' 9.3" LO.**

SOURCES: Georgia Public Water Source Inventory, 1994; US Census Bureau 1990; Ga. Water Source Inv., USGS, 1995

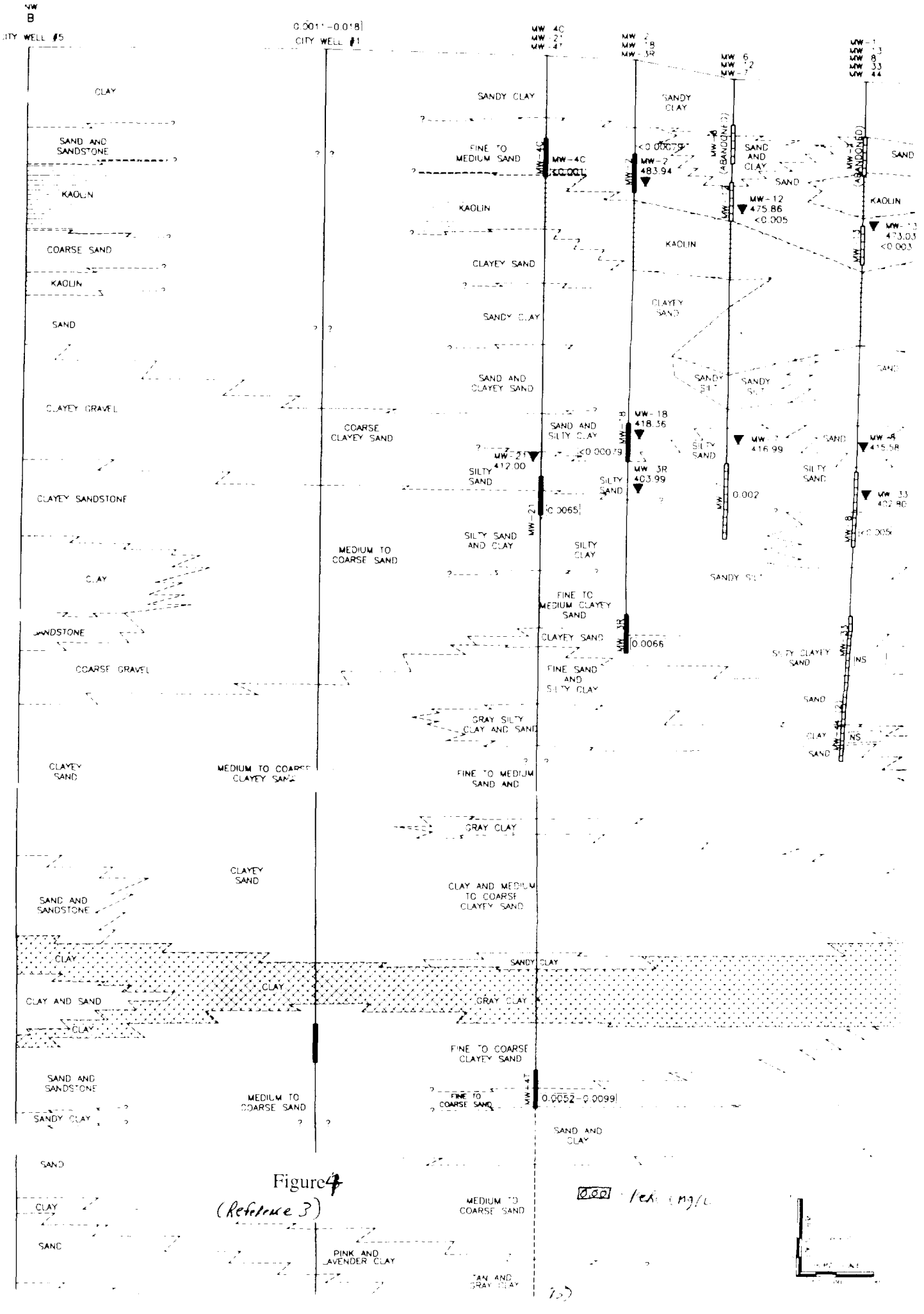
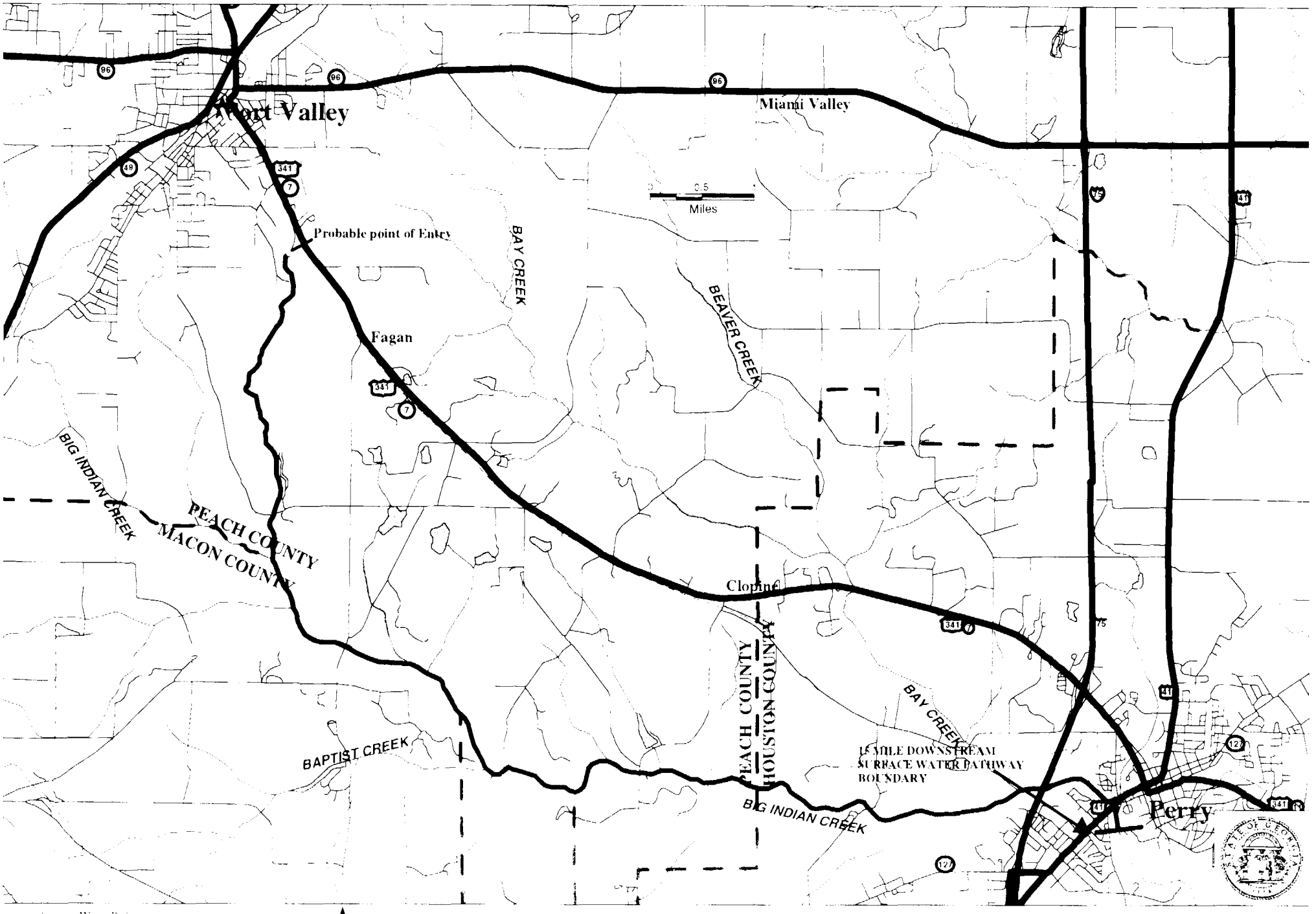
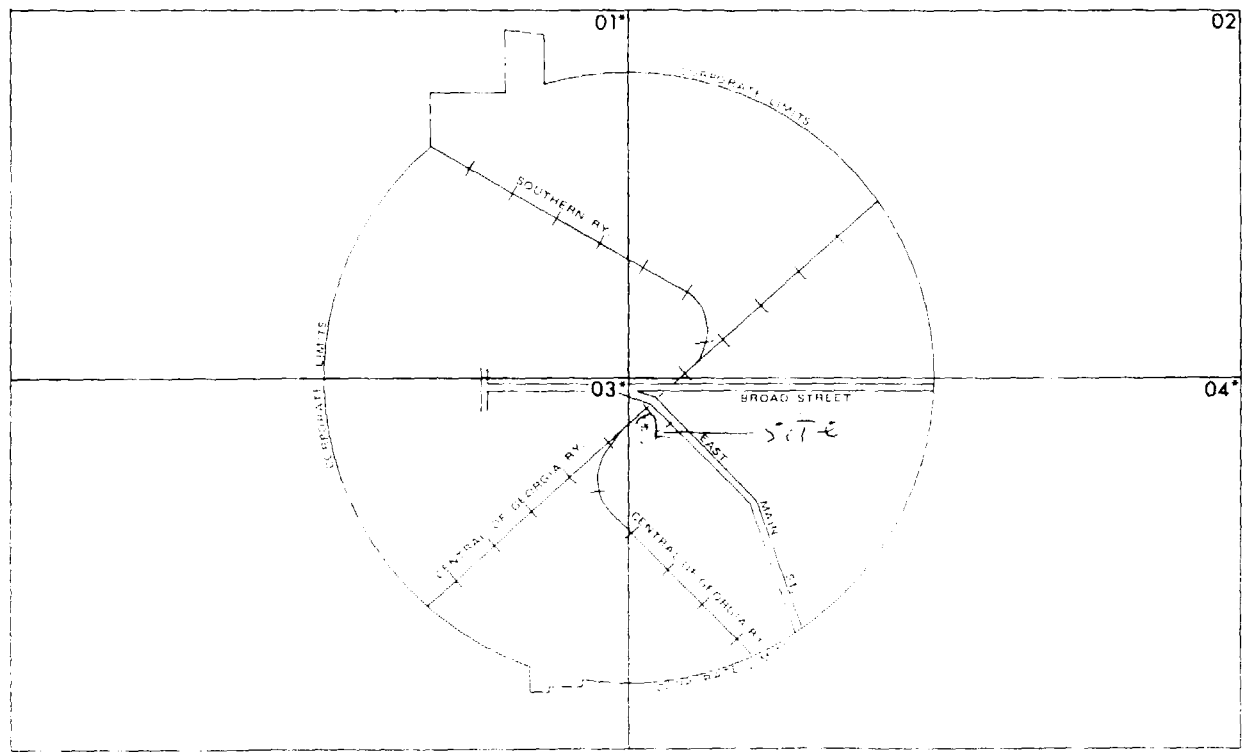



Figure 4
(Reference 3)




ANTHOINE MACHINE WORKS - FORT VALLEY, PEACH COUNTY
15 MILE SURFACE WATER DOWNSTREAM PATHWAY

Source: '99 Census Bureau TIGER US EPA GIRAS Landuse GA DOT Wetlands




*NOT PRINTED (ALL ZONE C)

KEY TO SYMBOLS

ZONE DESIGNATIONS* WITH DATE OF IDENTIFICATION ie. 12/2/74

ZONE C
ZONE A
DATE
ZONE C

Base Flood Elevation Line ——513——

Base Flood Elevation (513' MSL)

Elevation Reference Mark RM2

River Mile · M15

*EXPLANATION OF ZONE DESIGNATIONS

A flood insurance map displays the zone designations for a community according to areas of designated flood hazards. The zone designations used by FIA are

| Zone Symbol | Category |
|---|---|
| A | Area of special flood hazards (SFH) and without base flood elevations determined |
| A1 through A30 | Area of special flood hazards (SFH) with base flood elevations. Zones are assigned according to flood hazard factors and date of SFH identification |
| AO | Area of special flood hazards that have shallow flood depths (less than two feet) and or undetermined flow paths. Base flood elevations are not determined |
| V | Area of special flood hazards with velocity (tidal or flood) hazards. Zones are assigned according to flood hazard factors and date of SFH identification |
| B | Area of moderate flood hazards |
| C | Area of minimal flood hazards |
| D | Area of undetermined but possible flood hazards |

CONSULT NFIA SERVICING COMPANY OR LOCAL INSURANCE AGENT OR BROKER TO DETERMINE IF PROPERTIES IN THIS COMMUNITY ARE ELIGIBLE FOR FLOOD INSURANCE.

INITIAL IDENTIFICATION DATE JULY 26, 1974

MAP REVISED JANUARY 9, 1976
TO REFLECT FLOOD NEAR FLOOD BOUNDARY & ADD STRIP

MAP REVISED JUNE 25, 1978
TO REFLECT INVERSION FROM [illegible]

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

FLOOD HAZARD BOUNDARY MAP H [illegible] 04
FLOOD INSURANCE RATE MAP I [illegible] 04

**MAP INDEX**

CITY OF FORT VALLEY, GA
(PEACH CO.)

COMMUNITY NO 130148B

Figure 6

# APPENDIX 1

# Site Investigation Sampling Plan

# ANTHOINE MACHINE WORKS

GA0001020874

Fort Valley, Georgia

SEPTEMBER 30, 1997

Prepared by:
Robert Pierce, Geologist
Georgia Environmental Protection Division
Hazardous Waste Management Branch

Approved by:
David Yardumian
Unit Coordinator
Hazardous Waste Managemt Branch

## TABLE OF CONTENTS


| Section No. | Section Title | Page No. |
|---|---|---|
| 1.0 | Introduction | 1 |
| 2.0 | Site Description/Location | 1 |
| 3.0 | Operational History & Waste Characteristics | 1 |
| 4.0 | Quality Control Procedures | 1 |
| 5.0 | Investigation Derived Waste Plan | 2 |
| 6.0 | Project Management | 2 |
| 7.0 | Field Equipment/Health & Safety | 2. |
| 8.0 | Project Schedule | 2 |
| 9.0 | Collection of Non-Sampling Data | 2 |
| 10.0 | Sampling Activities | 2 |
| 11.0 | Quality Assurance | 3 |
| 12.0 | Field Activities | 3 |

## 1.0 INTRODUCTION

Under Authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization of 1986 (SARA), and pursuant to grant commitments to the U. S. Environmental Protection Agency (USEPA) Region IV, the State of Georgia Environmental Protection Division (EPD) is conducting a site inspection (SI) at the Anthoine Machine Works site in Fort Valley, Peach County, Georgia. The purpose of the (SI) is to collect information at the Anthoine Machine Works Site sufficient to assess the threat posed to human health and the environment, and to determine the need for additional investigation under CERCLA/SARA or other authority. The scope of the SI includes review of available file information, sampling of waste and environmental media to test preliminary assessment (PA) hypotheses and document hazard ranking system (HRS) factor values and scores, and collecting non-sampling information.

## 2.0 SITE DESCRIPTION/LOCATION

The Anthonine Machine Works Site was identified on the Georgia Wellhead Protection Plan for the City of Fort Valley as a potential source of Tetrachloroethylene (PCE) in City of Fort Valley municipal wells 1 and 2. The plan was prepared by the Georgia Geologic Survey Branch (GSB) of the Georgia Environmental Protection Division and is dated 10/25/96. A separate GSB memo dated 12/11/96 specifically evaluates potential sources of PCE in these municipal wells, and lists the machine works as a potential PCE source. Anthonine Machine Works is located at 311 Railroad St., Fort Valley, Georgia 31030 (Latitude 32°33'04.8"N, Longitude 83°53'09.3"W). The site is in downtown Fort Valley at the intersection of Railroad and Preston Streets. The surrounding land use is industrial. The Central of Georgia Railroad tracks are just across Railroad St. to the NorthWest, and the former Woolfolk Chemical Works bounds the machine works' property to the southeast. The site property is bounded to the northeast by a vacant field, and to the southwest by Preston Street.

## 3.0 OPERATIONAL HISTORY & WASTE CHARACTERISTICS

Anthonine Machine Works has been in Fort Valley Since the late 1800's. The original facility is shown in a 1930 Sanborn Fire Insurance Map at the south east corner of Preston and Railroad Streets approximately 200 feet southwest of its present location. Currently, organic solvents are used to wash parts at a small cleaning station. Spent solvents are currently being removed and replaced by Safety Kleen, Inc.

## 4.0 QUALITY CONTROL PROCEDURES

In order to avoid cross contamination, dedicated scoops, dishes, and coring equipment will be used as much as possible.

## 5.0 INVESTIGATION-DERIVED WASTE PLAN

Since only soil will be sampled, all soil not collected as a sample will be placed back in the hole from which it was removed.

## 6.0 PROJECT MANAGEMENT

The project manager for the Anthoine Machine Works SI sampling will be Robert Pierce of the Georgia Environmental Protection Division's Hazardous Waste Management Branch. The project manager will also serve as the site safety officer, and will collect and manage all samples. Four (4) soil samples are proposed for this site.

## 7.0 FIELD EQUIPMENT/HEALTH AND SAFETY

Safety monitoring equipment will consist of an Hnu PID which will be used at all sampling locations prior and during sampling. Protective clothing will be Level D, with latex gloves worn during sampling operations. Hard hats, ear protection, and steel toed shoes will be worn at all times around the direct push soil probe.

## 8.0 PROJECT SCHEDULE

The samples will be collected the week of October 27 1997, and will be taken to the Georgia Environmental Protection Laboratory either late the same day or on the following day. The laboratory turn around time is uncertain but should be about 4 weeks.

## 9.0 COLLECTION OF NON-SAMPLING DATA

Only immediately apparent visual data will be collected.

## 10.0 SAMPLING ACTIVITIES

This site is located in the vicinity of several potential sources of tetrachloroethylene (PCE), and City Wells 1 and 2. These two city wells utilize the Tuscaloosa aquifer and have shown PCE contamination above the MCL. An existing Tuscaloosa monitoring well located on the Anthonine Machine Works Site has shown detectable amounts of PCE. Since we know that PCE ground water contamination exists at depth under the site, we are proposing four (4) soil samples be taken above the shallow water table which is probably 30 feet BLS. The samples will be analyzed for VOCs. If these samples show PCE contamination, it may be reasonable to attribute at least part of the municipal well contamination to downward migration of PCE from the facility. A sample location map is attached.

## 11.0 QUALITY ASSURANCE

Sample containers preservatives, and holding times will conform to the USEPA Region IV SOP/QAM dated May 1996.

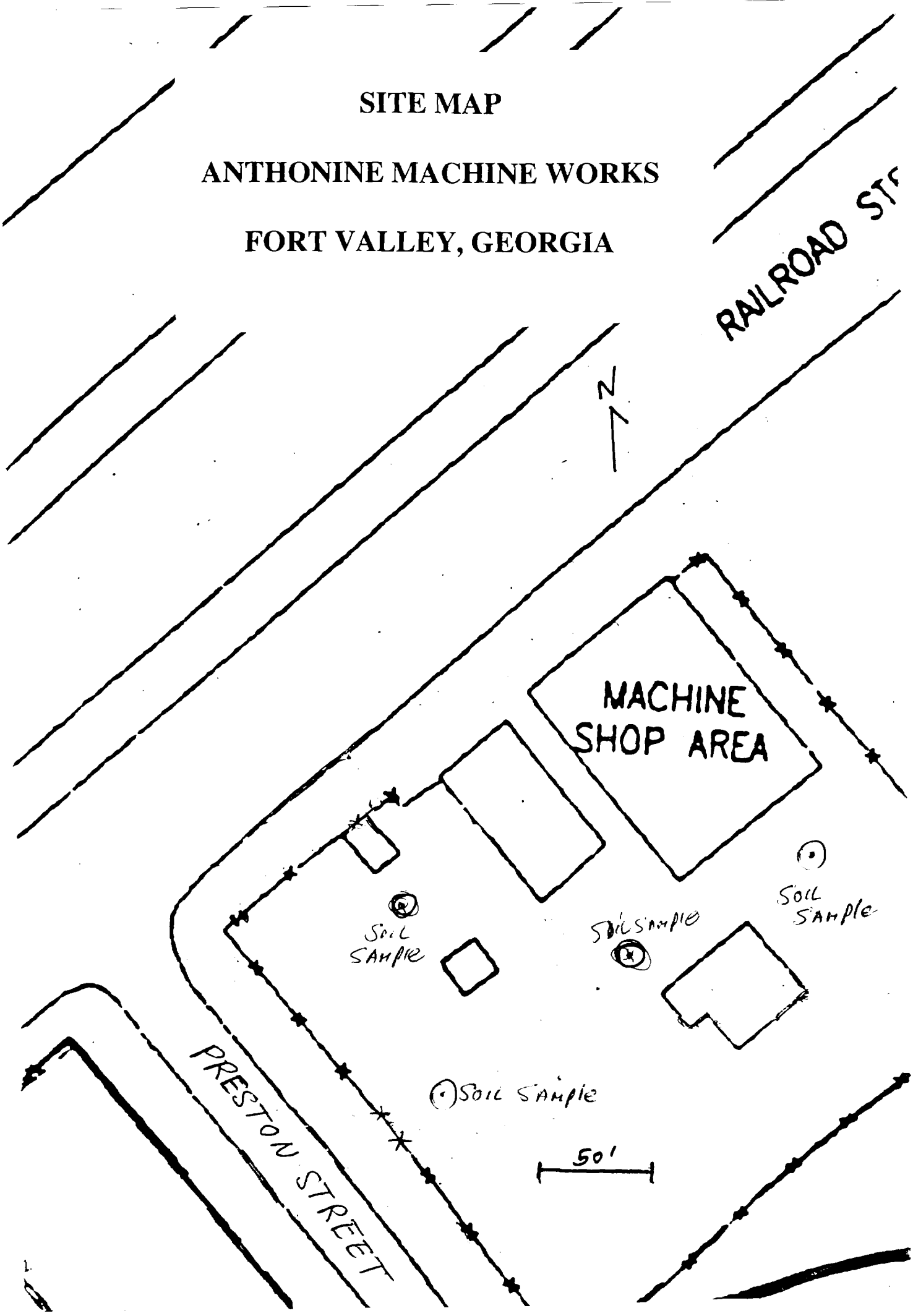
## 12.0 FIELD ACTIVITIES

Samples will be collected the week of October 27, 1997 using direct push technology. There will be three people involved. Two people will operate the direct push soil probe, and the third person will serve as safety officer as well as collect and manage the samples. Chain of custody protocol will be observed.

# SITE MAP

# ANTHONINE MACHINE WORKS

# FORT VALLEY, GEORGIA



# APPENDIX 2

# EPD HAZARDOUS WASTE MANAGEMENT BRANCH

FLOYD TOWER EAST, SUITE 1154, 205 BUTLER STREET, ATLANTA, GA 30344
PHONE 404-656-7802 FAX 404-651-9425

## CHAIN OF CUSTODY

FACILITY:

| SAMPLE # | HWMB LOG # | LAB # | DESCRIPTION | ANALYZE FOR | PRESERV Y/N | COLLECT BY (NAME) | DATE | TIME | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 7369 | | | | | | | | |
| 2 | 7370 | | | | | | | | |
| 3 | 7371 | | | | | | | | |
| 4 | 7372 | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

### TRANSFER RECORD

| TRANSFERRED BY (NAME) | TO (NAME) (IF FINAL: LAB NAME) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (NAME) | DATE |
|---|---|---|---|---|---|---|
| Bob Pierie | EPD LAB | 10/30/97 | 940 | HAND | Mike Basinajian | 10/30/97 |
| | | | | | | |
| | | | | | | |

Sample #1

# HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
## REQUEST FOR LABORATORY ANALYSIS

GHL

Facility Name/Location: Anthoine Machine Works / Fort Valley, GA

Sample Collected By/Phone: Bob Pierce 404-656-2833

Collection Date: 10/29/97

Date Submitted To Lab: 10/30/97

HWMB LOG NUMBER: 7369

*(File a separate Request Sheet for each sample point)*

Georgia Dept. of Natural Resources

AB84433 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC ANTHOINE MACHINE WORKS HW7369
Sample collector: B PEIRCE

Analysis Needed By: Routine ✓ Other (sp

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | ✓ | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

Concentration of Organics Requested (estimated): High ___ Low ✓ Other (e.g., rinse blank - specify) ___

Describe Sample Including Source And Known Properties (e.g., pH, concentration):
Soil Sample from machine works' Property — Possible PCE Contamination.

Applicable Hazardous Waste Codes (if known) ___ ___ ___

Special Precautions: ___

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ |
| Volatiles | ✓ |
| Pesticides | ___ |
| Herbicides | ___ |
| Organophosphorous Pesticides | ___ |
| PCB | ___ |
| BETX | ___ |
| Total Petroleum Hydrocarbon | ___ |

Organics Special Request: ___

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

2 4 OZ. JARS
___ 8 OZ. JARS
___ 16 OZ. JARS

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

Additional Specific Organics For TCLP: ___

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ___

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | [signature] | Date: | 10/29/97 | Received By (EPD Lab): | MCB |
| Approved By (HWMB): | [signature] | Date: | 10/30 | Date (EPD Lab): | 10/30/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | B PEIRCE | **Sample ID :** | **AB84433** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/29/97 |
| **Time Received:** | 10:59 | **Time Collected:** | -0- |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7369 |
| **Sample Site:** | ANTHOINE MACHINE WORKS HW7369 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 44.6 | | ug/kg | SMA | 11/05/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/05/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 48.9 | | ug/kg | SMA | 11/05/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits


**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 'ethylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.9 | | ug/kg | SMA | 11/05/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/05/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/05/97 |

**mple comments :**

*End of Report*



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits


**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

SAMPLE #2

# HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
## REQUEST FOR LABORATORY ANALYSIS

GHL

Facility Name/Location: Anthoine Machine Works / Fort Valley, GA

Sample Collected By/Phone: Bob Pierce 404-656-2833

Collection Date: 10/29/97

Date Submitted To Lab: 10/30/97

HWMB LOG NUMBER: 7370

*(File a separate Request Sheet for each sample point)*

Georgia Dept. of Natural Resources

AB84434 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC ANTHOINE MACHINE WORKS HW7370
Sample collector: B PEIRCE

Analysis Needed By: Routine ✓ Other (specify)

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | ✓ | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

Concentration of Organics Requested (estimated): High ___ Low ✓ Other (e.g., rinse blank - specify) ___

Describe Sample Including Source And Known Properties (e.g., pH, concentration):
Soil Sample from machine works' property - Possible PCE contamination.

Applicable Hazardous Waste Codes (if known) ___ ___ ___

Special Precautions: ___

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ |
| Volatiles | ✓ |
| Pesticides | ___ |
| Herbicides | ___ |
| Organophosphorous Pesticides | ___ |
| PCB | ___ |
| BETX | ___ |
| Total Petroleum Hydrocarbon | ___ |

Organics Special Request: ___

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

2 4 OZ. JARS
___ 8 OZ. JARS
___ 16 OZ. JARS

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

Additional Specific Organics For TCLP: ___

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ___

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | [illegible] | Date: | 10/29/97 | Received By (EPD Lab): | MCB |
| Approved By (HWMB): | DK | Date: | 10/30 | Date (EPD Lab): | 10/30/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | B PEIRCE | **Sample ID :** | **AB84434** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/29/97 |
| **Time Received:** | 10:59 | **Time Collected:** | -0- |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7370 |
| **Sample Site:** | ANTHOINE MACHINE WORKS HW7370 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 43.6 | | ug/kg | SMA | 11/04/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 46.8 | | ug/kg | SMA | 11/04/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 'ethylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | ı-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | SMA | 11/04/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 45.1 | | ug/kg | SMA | 11/04/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/04/97 |

**ᐧmple comments :**

*End of Report*



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits


**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# REQUEST FOR LABORATORY ANALYSIS

Facility Name/Location: Anthoine Machine Works / Fort Valley, GA

Sample Collected By/Phone: Bob Pierce 404-656-2833

Collection Date: 10/29/97

Date Submitted To Lab: 10/30/97

HWMB LOG NUMBER: 7371

*(File a separate Request Sheet for each sample point)*

Georgia Dept. of Natural Resources

AB84435 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC ANTHOINE MACHINE WORKS HW7371
Sample collector: B PEIRCE

Analysis Needed By: Routine ✓ Oth

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | | Soil/Sediment | ✓ | Sludge | |
| Ground Water | | Surface Water | | Drinking Water Well | |

Concentration of Organics Requested (estimated): High ___ Low ✓ Other (e.g., rinse blank - specify) ___

Describe Sample Including Source And Known Properties (e.g., pH, concentration):
Soil Sample from machine works' Property - Possible PCE Contamination.

Applicable Hazardous Waste Codes (if known) ___ ___ ___

Special Precautions: ___

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | |
| Volatiles | ✓ |
| Pesticides | |
| Herbicides | |
| Organophosphorous Pesticides | |
| PCB | |
| BETX | |
| Total Petroleum Hydrocarbon | |

Organics Special Request: ___

1 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | |
| Mercury | |
| Metals Special Request: | |

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | | Pesticides | |
| Semi-Volatiles (Acid & Base/Neutral) | | Herbicides | |

Additional Specific Organics For TCLP: ___

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | | Additional Metals For TCLP: | |
| Mercury | | | |

ADDITIONAL ANALYSIS REQUESTED (see list on back): ___

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | [illegible] | Date: | 10/29/97 | Received By (EPD Lab): | MLB |
| Approved By (HWMB): | [illegible] | Date: | 10/30 | Date (EPD Lab): | 10/30/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | B PEIRCE | **Sample ID :** | **AB84435** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/29/97 |
| **Time Received:** | 10:59 | **Time Collected:** | -0- |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7371 |
| **Sample Site:** | ANTHOINE MACHINE WORKS HW7371 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |



PARAMETER CODE: EPA
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Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.2 | | ug/kg | SMA | 11/04/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 49.2 | | ug/kg | SMA | 11/04/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |

**Sample ID : AB84435**



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 45.1 | | ug/kg | SMA | 11/04/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/04/97 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

SAMPLE # 4

# HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
## REQUEST FOR LABORATORY ANALYSIS

GHL

Facility Name/Location: Anthoine Machine Works / Fort Valley, GA

Sample Collected By/Phone: Bob Pierce 404-656-2833

Georgia Dept. of Natural Resources

Collection Date: 10/29/97

Date Submitted To Lab: 10/30/97

HWMB LOG NUMBER: 7372

*(File a separate Reqest Sheet for each sample point)*

AB84436 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC ANTHOINE MACHINE WORKS HW7372
Sample collector: B PEIRCE

Analysis Needed By: Routine ✓ Ot

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | ✓ | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

Conncentration of Organics Requested (estimated): High ___ Low ✓ Other (e.g., rinse blank - specify) ___

Describe Sample Including Source And Known Properties (e.g., pH, concentration):
Soil Sample from machine works' Property - Possible PCE Contamination.

Applicable Hazardous Waste Codes (if known) ___ ___ ___

Special Precautions: ___

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ |
| Volatiles | ✓ |
| Pesticides | ___ |
| Herbicides | ___ |
| Organophosphorous Pesticides | ___ |
| PCB | ___ |
| BETX | ___ |
| Total Petroleum Hydrocarbon | ___ |

Organics Special Request: ___

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

___

___

___

2 4 OZ. JARS
8 OZ. JARS
— 16 OZ. JARS

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

Additional Specific Organics For TCLP: ___

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | ___ |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ___

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | [illegible] | Date: | 10/29/97 | Received By (EPD Lab): | MCB |
| Approved By (HWMB): | [illegible] | Date: | 10/30 | Date (EPD Lab): | 10/30/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | B PEIRCE | **Sample ID :** | **AB84436** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/29/97 |
| **Time Received:** | 10:59 | **Time Collected:** | -0- |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7372 |
| **Sample Site:** | ANTHOINE MACHINE WORKS HW7372 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ' 2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | ,,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.4 | | ug/kg | SMA | 11/04/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 49.2 | | ug/kg | SMA | 11/04/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits


**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.6 | | ug/kg | SMA | 11/04/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/04/97 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# APPENDIX 3

# FROST ASSOCIATES

88 Founders Village, Clinton, CT 06426
(860) 669-5859 FAX (860) 669-5859


September 16, 1997


RECEIVED
SEP 19 1997
ENVIRONMENTAL PROTECTION
HAZARDOUS WASTE MGMT BRANCH


To: Environmental Protection Division
205 Butler St., Floyd Towers East, Suite 1154
Atlanta, GA 30334

Attn: James Ussery

Fr: Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Anthoine Machine Works
3111 Railroad Street, East Valley, GA

CERCLIS:

Job: 05000.3000

Site Longitude: 83-53-09.3 83.885918
Site Latitude : 32-33-04.8 32.551331

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the included Block Groups. Boundary records are then sorted in adjacent side order to determine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adjacent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)}

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 populu tion and house count extracted from the Census Bureau's 1990 STF-1A files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

Anthoine Machine Works
3111 Railroad Street, East Valley, GA

| No. | City | Block Group ID | Blk Grp People | House Holds | Public Water | Drilled Wells | Dug Wells | Other |
|---|---|---|---|---|---|---|---|---|
| 1 | Zenith | 13079 0702 3 | 1021 | 358 | 35 | 298 | 42 | 0 |
| 2 | Marshallville | 13193 9801 1 | 889 | 327 | 245 | 66 | 28 | 0 |
| 3 | Marshallville | 13193 9801 2 | 1119 | 369 | 303 | 44 | 24 | 0 |
| 4 | Fort Valley | 13225 0402 1 | 1930 | 718 | 453 | 194 | 19 | 0 |
| 5 | Fort Valley | 13225 0402 2 | 1842 | 600 | 476 | 85 | 23 | 10 |
| 6 | Fort Valley | 13225 0404 1 | 4415 | 1258 | 1275 | 36 | 0 | 0 |
| 7 | Fort Valley | 13225 0404 2 | 1160 | 456 | 435 | 28 | 0 | 0 |
| 8 | Fort Valley | 13225 0404 3 | 132 | 49 | 4 | 24 | 4 | 0 |
| 9 | Fort Valley | 13225 0403011 | 2434 | 888 | 744 | 100 | 52 | 0 |
| 10 | Fort Valley | 13225 0403012 | 267 | 136 | 122 | 0 | 0 | 0 |
| 11 | Fort Valley | 13225 0403013 | 74 | 25 | 11 | 16 | 0 | 0 |
| 12 | Fort Valley | 13225 0403021 | 1773 | 728 | 702 | 45 | 0 | 0 |
| | Totals: | | 17056 | 5912 | 4805 | 936 | 192 | 10 |

Anthoine Machine Works
3111 Railroad Street, East Valley, GA

| City | Census Tract ID | Tract People | House Count | Public Water | Drilled Wells | Dug Wells | Other Sources |
|---|---|---|---|---|---|---|---|
| Fort Valley | 13225 0404 2 | 1160 | 456 | 435 | 28 | 0 | 0 |
| Fort Valley | 13225 0404 3 | 132 | 49 | 4 | 24 | 4 | 0 |
| Fort Valley | 13225 0403011 | 2434 | 888 | 744 | 100 | 52 | 0 |
| Fort Valley | 13225 0402 1 | 1930 | 718 | 453 | 194 | 19 | 0 |
| Fort Valley | 13225 0402 2 | 1842 | 600 | 476 | 85 | 23 | 10 |
| Fort Valley | 13225 0404 1 | 4415 | 1258 | 1275 | 36 | 0 | 0 |
| Fort Valley | 13225 0403012 | 267 | 136 | 122 | 0 | 0 | 0 |
| Fort Valley | 13225 0403013 | 74 | 25 | 11 | 16 | 0 | 0 |
| Fort Valley | 13225 0403021 | 1773 | 728 | 702 | 45 | 0 | 0 |
| | Sub Totals: | 14027 | 4858 | 4222 | 528 | 98 | 10 |
| Marshallville | 13193 9801 1 | 889 | 327 | 245 | 66 | 28 | 0 |
| Marshallville | 13193 9801 2 | 1119 | 369 | 303 | 44 | 24 | 0 |
| | Sub Totals: | 2008 | 696 | 548 | 110 | 52 | 0 |
| Zenith | 13079 0702 3 | 1021 | 358 | 35 | 298 | 42 | 0 |
| | Sub Totals: | 1021 | 358 | 35 | 298 | 42 | 0 |

Anthoine Machine Works
3111 Railroad Street, East Valley, GA

For Radius of 4 Mi., Circle Area = 50.265482

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 1 | Zenith | 13079 7023 | 54.974583 | 4.192962 | 7.63 |
| 2 | Marshallville | 13193 98011 | 32.482712 | 0.117840 | 0.36 |
| 3 | Marshallville | 13193 98012 | 44.204765 | 0.225304 | 0.51 |
| 4 | Fort Valley | 13225 4021 | 23.839167 | 9.292035 | 38.98 |
| 5 | Fort Valley | 13225 4022 | 25.240511 | 9.079605 | 35.97 |
| 6 | Fort Valley | 13225 403021 | 15.109613 | 6.578419 | 43.54 |
| 7 | Fort Valley | 13225 4042 | 3.236910 | 2.542618 | 78.55 |
| 8 | Fort Valley | 13225 4043 | 10.538867 | 0.960698 | 9.12 |
| 9 | Fort Valley | 13225 403011 | 11.290280 | 10.230000 | 90.61 |
| 10 | Fort Valley | 13225 403012 | 0.132098 | 0.132098 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533359 | 0.533359 | 100.00 |
| 12 | Fort Valley | 13225 4041 | 7.808229 | 6.380545 | 81.72 |
| | Totals: | | 229.391083 | 50.265484 | |

For Radius of 3 Mi., Circle Area = 28.274334

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.839167 | 4.748510 | 19.92 |
| 5 | Fort Valley | 13225 4022 | 25.240511 | 5.463719 | 21.65 |
| 6 | Fort Valley | 13225 403021 | 15.109613 | 3.958167 | 26.20 |
| 7 | Fort Valley | 13225 4042 | 3.236910 | 1.237692 | 38.24 |
| 8 | Fort Valley | 13225 4043 | 10.538867 | 0.107113 | 1.02 |
| 9 | Fort Valley | 13225 403011 | 11.290280 | 7.139364 | 63.23 |
| 10 | Fort Valley | 13225 403012 | 0.132098 | 0.132098 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533359 | 0.533359 | 100.00 |
| 12 | Fort Valley | 13225 4041 | 7.808229 | 4.954313 | 63.45 |
| | Totals: | | 97.729027 | 28.274334 | |

For Radius of 2 Mi., Circle Area = 12.566371

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.839167 | 1.936309 | 8.12 |
| 5 | Fort Valley | 13225 4022 | 25.240511 | 2.574607 | 10.20 |
| 6 | Fort Valley | 13225 403021 | 15.109613 | 2.069138 | 13.69 |
| 7 | Fort Valley | 13225 4042 | 3.236910 | 0.272168 | 8.41 |
| 9 | Fort Valley | 13225 403011 | 11.290280 | 2.807369 | 24.87 |
| 10 | Fort Valley | 13225 403012 | 0.132098 | 0.132098 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533359 | 0.142068 | 26.64 |
| 12 | Fort Valley | 13225 4041 | 7.808229 | 2.632614 | 33.72 |
| | Totals: | | 87.190163 | 12.566371 | |

Anthoine Machine Works
3111 Railroad Street, East Valley, GA

For Radius of 1 Mi., Circle Area = 3.141593

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.839167 | 0.525247 | 2.20 |
| 5 | Fort Valley | 13225 4022 | 25.240511 | 1.092645 | 4.33 |
| 6 | Fort Valley | 13225 403021 | 15.109613 | 0.658477 | 4.36 |
| 9 | Fort Valley | 13225 403011 | 11.290280 | 0.251101 | 2.22 |
| 10 | Fort Valley | 13225 403012 | 0.132098 | 0.106483 | 80.61 |
| 12 | Fort Valley | 13225 4041 | 7.808229 | 0.507641 | 6.50 |
| | Totals: | | 83.419899 | 3.141593 | |

For Radius of .5 Mi., Circle Area = 0.785398

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.839167 | 0.094180 | 0.40 |
| 5 | Fort Valley | 13225 4022 | 25.240511 | 0.301942 | 1.20 |
| 6 | Fort Valley | 13225 403021 | 15.109613 | 0.149142 | 0.99 |
| 12 | Fort Valley | 13225 4041 | 7.808229 | 0.240134 | 3.08 |
| | Totals: | | 71.997520 | 0.785398 | |

or Radius of .25 Mi., Circle Area = 0.196350

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.839167 | 0.000724 | 0.00 |
| 5 | Fort Valley | 13225 4022 | 25.240511 | 0.081808 | 0.32 |
| 6 | Fort Valley | 13225 403021 | 15.109613 | 0.004018 | 0.03 |
| 12 | Fort Valley | 13225 4041 | 7.808229 | 0.109799 | 1.41 |
| | Totals: | | 71.997520 | 0.196350 | |

Anthoine Machine Works
3111 Railroad Street, East Valley, GA

========== Site Data ==========

| | |
|---|---|
| Population: | 9351.00 |
| Households: | 3199.27 |
| Drilled Wells: | 309.19 |
| Dug Wells: | 66.59 |
| Other Water Sources: | 3.60 |

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

| | |
|---|---|
| Population: | 2977.05 |
| Households: | 1040.08 |
| Drilled Wells: | 127.33 |
| Dug Wells: | 24.90 |
| Other Water Sources: | 1.43 |

** Population On Private Wells: 435.73

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

| | |
|---|---|
| Population: | 3308.48 |
| Households: | 1114.02 |
| Drilled Wells: | 107.65 |
| Dug Wells: | 24.87 |
| Other Water Sources: | 1.14 |

** Population On Private Wells: 393.55

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

| | |
|---|---|
| Population: | 2309.55 |
| Households: | 760.48 |
| Drilled Wells: | 59.73 |
| Dug Wells: | 14.25 |
| Other Water Sources: | 0.59 |

** Population On Private Wells: 224.67

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

| | |
|---|---|
| Population: | 572.98 |
| Households: | 228.80 |
| Drilled Wells: | 11.15 |
| Dug Wells: | 2.22 |
| Other Water Sources: | 0.31 |

** Population On Private Wells: 33.47

Anthoine Machine Works
3111 Railroad Street, East Valley, GA

---- Within Ring: .5 Mile(s) and .25 Mile(s) ----

| | |
|---|---|
| Population: | 114.36 |
| Households: | 36.04 |
| Drilled Wells: | 2.53 |
| Dug Wells: | 0.28 |
| Other Water Sources: | 0.09 |

** Population On Private Wells: 8.92

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

| | |
|---|---|
| Population: | 68.58 |
| Households: | 19.85 |
| Drilled Wells: | 0.80 |
| Dug Wells: | 0.08 |
| Other Water Sources: | 0.03 |

** Population On Private Wells: 3.02

** Total Population On Private Wells: 1099.36

# APPENDIX 4

# *GEORGIA WELLHEAD PROTECTION PLAN*

*for*

*CITY of FORT VALLEY*

*PEACH COUNTY*

*Permit # 2250001*

*Expiration Date: July 27, 2001*

| | | | |
|---|---|---|---|
| *Field Survey By:* | *Jim Guentert, Sue Grunwald and Sandra Jo Robertson* | | *Date:* *09/23-27/96* |
| *Prepared By:* | *Sandra Jo Robertson* | | *Date:* *10/25/96* |
| *Checked By:* | | *Jim Guentert* | *Date:* 11/25/96 |
| *Checked By:* | | *Sue Grunwald* | *Date:* 11/5/96 |
| *Approved By:* | | *Roger Carter* | *Date:* 12/11/96 |

*Distribution:* *2 GGS Files;* *1 WRMB;* *1 Local Government*

## *SPECIAL NOTE*

At the time this Wellhead Protection Plan (WHPP) was prepared there had been detections in two wells of Perchloroethylene (PCE). Although no PCE has been detected in the treated drinking water, the Fort Valley Water Commission has expressed concern to the Environmental Protection Division and has requested the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources to assist in evaluating the situation. This WHPP, scheduled for preparation upon repermitting of the water system wells in the year 2002, was conducted earlier to assist in this effort.

A separate document, a memorandum dated December 11, 1996 and prepared by the Geologic Survey Branch of EPD, specifically evaluates potential sources of PCE. That memorandum is titled "Preliminary Identification of Potential Sources of Perchloroethylene in Fort Valley Municipal Wells 1 and 2."

# *SYSTEM INFORMATION*

| | |
|---|---|
| *Water System:* | City of Fort Valley |
| *County:* | Peach |
| *System ID. No.:* | 2250001 |
| *Expiration Date:* | 7/27/2001 |
| *Number of Wells:* | 8 (3 abandoned) |
| *System Type:* | municipal |
| *Population:* | 10,500 |
| *Class:* | 2 |
| *Region:* | 2 |
| *Province:* | Coastal Plain |
| *Aquifer Type:* | unconfined coastal plain |
| *Significant Recharge Area:** | yes |
| *Pollution Susceptibility:*** | higher susceptibility |
| *Supplier:* | City of Fort Valley Water System |
| *Contact:* | Mr. Glen Taylor |
| *Title:* | General Manager |
| *Address:* | City of Fort Valley<br>Utility Commission<br>P.O. Box 1529<br>Fort Valley, Georgia 31030-1529 |
| *Phone No.:* | 912-825-7701 |
| *Fax No.:* | 912-825-3177 |
| *WHPA Delineated:* | 09/20/96 |
| *PPSI Conducted:* | 09/23-27/96 |
| *Alternate Water Source:* | The City of Fort Valley has five connected wells. In the event one of the wells can no longer be used the other wells will supply the communities water needs until the well is operational or a new water source can be found. |

*Hydrologic Atlas 18, Most Significant Ground-Water Recharge Areas of Georgia, Georgia Department of Natural Resources, Atlanta, 1989.

**Hydrologic Atlas 20, Ground-Water Pollution Susceptibility Map of Georgia, Georgia Department of Natural Resources, Atlanta, 1992.

## *Part 1: DELINEATING THE WELLHEAD PROTECTION AREA*

see attached maps

### Well #1

(McLean #1)

| | |
|---|---|
| *Location description:* | Located on Central Avenue behind the water treatment plant near the intersection of Railroad St. |
| *Longitude:* | 83° 53' 10.3"W |
| *Latitude:* | 32° 33' 09.5"N |
| *Quadrangle:* | Fort Valley West |
| *Aquifer Type:* | unconfined coastal plain |
| *Delineation Method:* | volumetric flow equation |
| *Pumping Rate:* | 1000 gpm |
| *Cement Pad:* | present |
| *Well House:* | present (locked) |
| *Fence:* | present |
| *Locked Gate:* | present |
| *Control Zone:* | 15 foot radius |
| *Inner-Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1055 foot radius |

### Well #2

(Evans Well)

| | |
|---|---|
| *Location description:* | Located on N. Camellia Boulevard (Georgia Route 49) near the intersection of Miller St. and the railroad crossing. |
| *Longitude:* | 83° 53' 18.5"W |
| *Latitude:* | 32° 33' 02.3"N |
| *Quadrangle:* | Fort Valley West |
| *Aquifer Type:* | unconfined coastal plain |
| *Delineation Method:* | volumetric flow equation |
| *Pumping Rate:* | 1000 gpm |
| *Cement Pad:* | present |
| *Well House:* | present (locked) |
| *Fence:* | not present |
| *Locked Gate:* | not present |
| *Control Zone:* | 15 foot radius |
| *Inner-Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 985 foot radius |

## Well #3

(Jones #1)

| | |
|---|---|
| *Location description*: | Located at the intersection of Jones Alley and State College Drive next to the water treatment plant and across the street from Fort Valley State College |
| *Longitude:* | 83° 53' 50.6"W |
| *Latitude:* | 32° 32' 24.3"N |
| *Quadrangle:* | Fort Valley West |
| *Aquifer Type*: | unconfined coastal plain |
| *Delineation Method:* | volumetric flow equation |
| *Pumping Rate:* | 1000 gpm |
| *Cement Pad:* | present |
| *Well House:* | not present |
| *Fence:* | present |
| *Locked Gate:* | present |
| *Control Zone:* | 15 foot radius |
| *Inner-Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1100 foot radius |

## Well #4

(Jones #2)

| | |
|---|---|
| *Location description*: | Located on Charlevoix St. near the Jones Alley water treatment plant |
| *Longitude:* | 83° 53' 49.7"W |
| *Latitude:* | 32° 32' 29.5"N |
| *Quadrangle:* | Fort Valley West |
| *Aquifer Type*: | unconfined coastal plain |
| *Delineation Method:* | volumetric flow equation |
| *Pumping Rate:* | 1350 gpm |
| *Cement Pad:* | present |
| *Well House:* | not present |
| *Fence:* | present |
| *Locked Gate:* | present |
| *Control Zone:* | 15 foot radius |
| *Inner-Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1180 foot radius |

## Well #5

(Courthouse Well)

| | |
|---|---|
| *Location description:* | Located on Central Avenue next to the Courthouse |
| *Longitude:* | 83° 53' 19.5"W |
| *Latitude:* | 32° 33' 10.6"N |
| *Quadrangle:* | Fort Valley West |
| *Aquifer Type:* | unconfined coastal plain |
| *Delineation Method:* | volumetric flow equation |
| *Pumping Rate:* | 1500 gpm |
| *Cement Pad:* | present |
| *Well House:* | present (locked) |
| *Fence:* | not present |
| *Locked Gate:* | not present |
| *Control Zone:* | 15 foot radius |
| *Inner-Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1490 foot radius |

## Kell Well

| | |
|---|---|
| *Location description:* | Located on Railroad St. near the Camellia Boulevard intersection |
| *Longitude:* | 83° 53' 15.0"W |
| *Latitude:* | 32° 33' 05.5"N |
| *Quadrangle:* | Fort Valley West |
| *Status:* | plugged and abandoned, according to conversation with John Harmon (wellhead has been removed) |

## Nick Well

| | |
|---|---|
| *Location description:* | Located on Central Avenue next to the McLean water treatment plant within a brick storage building. |
| *Longitude:* | 83° 53' 12.3"W |
| *Latitude:* | 32° 33' 09.1"N |
| *Quadrangle:* | Fort Valley West |
| *Status:* | plugged and abandoned, according to conversation with John Harmon |

## Old City Well

| | |
|---|---|
| *Location description:* | Located next to Well #1 at the McLean water treatment plant. |
| *Longitude:* | 83° 53' 09.9"W |
| *Latitude:* | 32° 33' 09.6"N |
| *Quadrangle:* | Fort Valley West |
| *Status:* | plugged and abandoned, according to conversation with John Harmon (the wellhead has been removed and the well paved over with asphalt) |

# PART 2: POTENTIAL POLLUTION SOURCE (PPS) INVENTORY

(see APPENDIX A for reference of PPS Codes)

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 3. | T01 | access and secondary roads |
| 4. | S05 | sewer lines |
| 5. | S08 | water treatment facility (McLean water treatment plant)<br>83° 53' 10.9"W 32° 33' 09.8"N<br>Address: City of Fort Valley<br>Utility Commission<br>P.O. Box 1529<br>Fort Valley, Georgia 31030-1529 |
| 6. | O08 | vehicle parking (located through out the wellhead protection areas) |
| 7. | T03 | major highways and railroads / Norfolk Southern railroad line<br>Address: Norfolk Southern railroad line<br>Chief Dispatcher Atlanta, GA 404-529-1347<br>D.M. Cochran Track Supervisor 404-529-1933 |
| 8. | T05 | railroad depot and loading platform<br>grease, waste oil, and batteries<br>83° 53' 08.5"W 32° 33' 07.2"N<br>Address: Norfolk Southern Corp - Southern Railway System<br>Maintenance of Way<br>200 E. Main St.<br>Fort Valley, GA<br>912-825-7026<br>Chief Dispatcher Atlanta, GA 404-529-1347<br>D.M. Cochran Track Supervisor 404-529-1933 |
| 9. | I10 | storm water runoff |
| 10. | I13 | test well / monitoring well (25 ft. deep, encountered kaolin lens)<br>The well was drilled by the State of Georgia<br>83° 53' 09.8"W 32° 33' 09.4"N |
| 11. | W06 | garbage transfer stations /dumpsters<br>(located throughout the wellhead protection area)<br>BFI Waste Systems<br>4291 Interstate Dr.<br>Macon, Ga<br>912-474-5972 |
| 12. | B23 | storage of paint, fuels, and oils<br>(located in abandoned Nix well house)<br>83° 53' 12.3"W 32° 33' 09.1"N<br>Address: City of Fort Valley<br>Utility Commission<br>P.O. Box 1529<br>Fort Valley, Georgia 31030-1529 |

| PPS # | PPS Code | Description |
|---|---|---|
| 13. | T03 | major highway Georgia Route 49 |
| 14. | T03 | major highway Georgia Route 96 |
| 15. | T03 | major highway U.S. Route 341 |
| 16. | B02 | auto repair / body shop<br>automobile oils and fluids<br>used oils, fluids, and filters are recycled with EnviroSafety<br>83° 53' 15.0"W 32° 33' 08.5"N<br>Address: Peach Mac<br>200 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-8628 |
| 17. | B13 | laundromat / dry cleaner<br>150 gallon trichlorethylene stored within the building<br>filters recycled with EnviroSafety<br>83° 53' 15.5"W 32° 33' 08.0"N<br>Address: Fabra Care Cleaners<br>204 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-8211 |
| 18. | B05 | car wash<br>83° 53' 17.2"W 32° 33' 07.6"N<br>Address: Splish Splash Car Wash<br>208 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>no phone |
| 19. | B23 | tire and oil change<br>used oils are recycled<br>83° 53' 07.1"W 32° 33' 17.2"N<br>Address: Valley Tire Service<br>106 N. Camellia<br>Fort Valley, Georgia 31030<br>912-827-0029 |
| 20. | B23 | marine engine repair<br>waste oil, solvents, paint, fuel<br>83° 53' 10.5"W 32° 33' 19.4"N<br>Address: Mark's Marine Engine Service<br>Route 49 N.<br>Fort Valley, Georgia 31030<br>912-822-9929 |

| PPS # | PPS Code | Description |
|---|---|---|
| 21. | B23 | auto detailing / car wash / window tinting<br>(previously Butler Chevrolet new and used car sales lot)<br>83° 53' 09.0"W 32° 33' 19.2"N<br>Mose's Car Customs<br>121 N Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-0152 |
| 22. | F04 | underground fuel storage tanks / diesel<br>83° 53' 12.8"W 32° 33' 16.3"N<br>Address: Bell South<br>110 Anderson Ave.<br>Fort Valley, Georgia 31030<br>912-780-2800 |
| 23. | F05 | abandoned underground fuel storage tanks<br>83° 53' 18.0"W 32° 33' 15.4"N<br>Address: Fort Valley Fire Station 1<br>W. Church St.<br>Fort Valley, Georgia 31030<br>912-825-5190 |
| 24. | B10<br>F04 | gasoline station / service bay / engine repair / oil and fluid change<br>underground fuel storage tank<br>83° 53' 22.3"W 32° 32' 55.5"N<br>Address: C&M Auto<br>Samuel Jones St.<br>Fort Valley, Georgia 31030 |
| 25. | B10<br>F04 | gasoline station / service bay / oil and fluid change<br>underground fuel storage tank<br>83° 53' 22.0"W 32° 32' 56.9"N<br>Address: Walker Union 76 Service Sation<br>525 Railroad St.<br>Fort Valley, Georgia 31030<br>912-825-3239 |
| 26. | F04 | underground fuel storage tank<br>83° 53' 25.1"W 32° 32' 57.7"N<br>Address: Bobby's Minit Mart Grocery<br>Fina Gas Station<br>702 Orange St.<br>Fort Valley, Georgia 31030<br>912-825-5249 |
| 27. | B14 | machine shop<br>Safety clean wash for machine parts<br>83° 53' 09.3"W 32° 33' 04.8"N<br>Address: Anthoine Machine Works<br>311 Railroad St.<br>Fort Valley, Georgia 31030<br>912-825-5613 |

| PPS # | PPS Code | Description |
|---|---|---|
| 28. | B02 | auto repair / fuel and oil change<br>motor oils / fluids / waste oil and waste fluids<br>83° 53' 04.0"W 32° 33' 07.8"N<br>Address: Giles Garage<br>303 Martin Luther King Jr. St.<br>Fort Valley, Georgia 31030<br>912-825-3779 |
| 29. | F05<br>B05<br>B23 | abandoned underground fuel storage tanks<br>car wash<br>oil change / window tinting and detail<br>83° 53' 04.7" 32° 33' 08.4"<br>Address: Auto Shade<br>One Stop Auto Service<br>301 Martin Luther King Jr. St.<br>Fort Valley, Georgia 31030<br>912-825-1666 |
| 30. | B23 | tire / motor oil / fluid change<br>used oils and fluids are recycled<br>83° 53' 02.7"W 32° 33' 04.6"N<br>Address: Holcomb Tire Service<br>306 Martin Luther King Dr.<br>Fort Valley, Georgia 31030<br>912-825-5256 |
| 31. | A06 | fertilizer storage<br>liquid nitrogen storage tanks (have spill containment systems)<br>83° 53' 23.7"W 32° 33' 00.7"N<br>Address: Fort Valley Oil Company Fertilizers and Lime<br>304 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-5531 |
| 32. | A06 | fertilizer storage<br>83° 53' 20.3"W 32° 33' 01.6"N<br>Address: Fort Valley Oil Company Fertilizers and Lime<br>304 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-5531 |
| 33. | F01 | above ground fuel storage tanks<br>diesel / hydraulic fluid / engine oil ( has spill containment system)<br>83° 53' 22.0"W 32° 33' 02.7"N<br>Address: Fort Valley Oil Company Fertilizers and Lime<br>304 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-5531 |

| PPS # | PPS Code | Description |
|---|---|---|
| 34. | S08 | water treatment facility (Jones Alley water treatment plant)<br>83° 53' 51.5"W 32° 32' 24.5"N<br>Address: City of Fort Valley<br>Utility Commission<br>P.O. Box 1529<br>Fort Valley, Georgia 31030-1529 |
| 35. | F04 | underground fuel storage tanks<br>83° 53' 55.9"W 32° 32' 19.4"N<br>Address: Highway Haven Food Store #2<br>Community Plaza<br>Chevron gas station<br>1200 State College Drive<br>Fort Valley, Georgia 31030<br>912-825-9085 |
| 36. | B13 | laundromat / dry cleaning<br>83° 53' 56.0"W 32° 32' 19.2"N<br>Address: Coin-Op Laundry / Dry Cleaning<br>State College Drive<br>Fort Valley, Georgia 31030 |
| 37. | B23 | auto paint and body shop<br>paints / solvents<br>83° 53' 56.1"W 32° 32' 18.9"N<br>Address: Appling's Paint and Body Shop<br>1206 State College Drive<br>Fort Valley, Georgia 31030<br>912-825-1220 |
| 38. | S01 | domestic septic system<br>83° 53' 52.0"W 32° 32' 23.4"N<br>Address: 405 Jones Alley<br>Fort Valley, Georgia 31030 |
| 39. | I02 | domestic wells |
| 40. | H05 | hazardous waste NPL location<br>registered NPL clean-up site.<br>83° 53' 11.7"W 32° 33' 02.8"N |
| 41. | B14 | machine shop (historical)<br>There is only a vacant lot at this location now. Approximately 50 years ago Eberhard machine shop was located here.<br>83° 53' 09.0"W 32° 33' 05.4"N |
| 42. | B23 | knitting mill (historical)<br>The knitting mill was destroyed by a tornado in 1975.<br>83° 53' 10.0"W 32° 33' 07.8"N |
| 43. | B23 | power generating plant (historical)<br>A power generating plant was once located at the present day McLean water treatment plant.<br>83° 53' 10.3"W 32° 33' 09.5"N |

| PPS # | PPS Code | Description |
|---|---|---|
| 44. | B13 | dry cleaners (historical)<br>A dry cleaners was once located at the present day Splish Splash car wash.<br>83° 53' 17.2"W 32° 33' 07.6"N |
| 45. | B17 | printers (historical)<br>A print shop was once located here. The building is abandoned.<br>83° 53' 13.9"W 32° 33' 08.0"N |
| 46. | B23 | cotton storage warehouse / rail transfer area (historical)<br>Trains passed through this area where a warehouse that stored cotton was once located.<br>83° 53' 13.0"W 32° 33' 07.4"N |
| 47. | B23 | cotton seed oil mill (historical)<br>83° 53' 12.7"W 32° 33' 06.5"N |
| 48. | B13 | dry cleaners (historical)<br>A dry cleaners was once located in the alley approximately 50 feet north of well #1<br>83° 53' 10.0"W 32° 33' 10.1"N |
| 49. | B13 | dry cleaners (historical)<br>Located on GA Route 49, the building now houses a law office.<br>83° 53' 12.1"W 32° 33' 13.0"N |
| 50. | B13 | dry cleaners (historical)<br>Located on Church approximately 50 feet east of PPS #49<br>83° 53' 12.5"W 32° 33' 13.0"N |
| 51. | B23 | gasoline station (historical)<br>No evidence of the gasoline station today. Formerly located at the corner of Central Avenue and GA Route 49.<br>83° 53' 14.4"W 32° 33' 09.0"N |
| 52. | B23 | gasoline station (historical)<br>No evidence of the gasoline station today. Formerly located at the corner of College Street and GA Route 49.<br>83° 53' 17.1"W 32° 33' 05.3"N |

## *Well #1*

***Control Zone***
15 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 10. | I13 | test well / monitoring well |

***Inner-Management Zone:***
250 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 3. | T01 | access and secondary roads |
| 4. | S05 | sewer lines |
| 5. | S08 | water treatment facility (McLean water treatment plant) |
| 6. | O08 | vehicle parking |
| 7. | T03 | major highways and railroads / Norfolk Southern railroad |
| 8. | T05 | railroad depot and loading platform |
| 9. | I10 | storm water runoff |
| 11. | W06 | garbage transfer stations / dumpsters |
| 12. | B23 | storage of fuels, paints, and oils |
| 15. | T03 | major highway / U.S. Route 341 |
| 43. | B23 | power generating plant (historical, no longer presaent) |
| 48. | B13 | dry cleaners (historical, no longer present) |

***Outer-Management Zone***
1055 foot radius

*Note:* PPS's 1, 2, 3, 4, 6, 7, 8, 9, 11 and 15 are also found in the Outer-Management Zone.

| PPS # | PPS Code | Description |
|---|---|---|
| 13. | T03 | major highway Georgia Route 49 |
| 14. | T03 | major highway Georgia Route 96 |
| 16. | B02 | auto repair / body shop |
| 17. | B13 | laundromat / dry cleaners |
| 18. | B05 | car wash |
| 19. | B23 | tire and oil change |
| 20. | B23 | marine engine repair |
| 21. | B23 | auto detailing / car wash / window tinting |
| 22. | F04 | underground fuel storage tanks / diesel |
| 23. | F05 | abandoned underground fuel storage tanks |
| 27. | B14 | machine shop |
| 28. | B02 | auto repair / fuel and oil change |
| 29. | F05 | abandoned underground fuel storage tanks |
| | B05 | car wash |
| | B23 | oil change / window tinting and detail |
| 30. | B23 | tire / motor oil / fluid change |
| 39. | I02 | domestic wells |

## *Well #1* *(continued)*

***Outer-Management Zone continued***
1055 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 40. | H05 | hazardous waste NPL site (former Woolfolk Chemical Site) |
| 41. | B14 | machine shop (historical, no longer present) |
| 42. | B23 | knitting mill (historical, no longer present) |
| 44. | B13 | dry cleaners (historical, no longer present) |
| 45. | B17 | printers (historical, currently an unoccupied building) |
| 46. | B23 | cotton storage warehouse / rail transfer area (historical, no longer present) |
| 47. | B23 | cotton seed oil mill (historical, no longer present) |
| 49. | B13 | dry cleaners (historical, no longer present) |
| 50. | B13 | dry cleaners (historical, no longer present) |
| 51. | B23 | gasoline station (historical, no longer present) |
| 52. | B23 | gasoline station (historical, no longer present) |

## *Well #2*

***Control Zone***
15 foot radius
No Potential Pollution Sources

***Inner-Management Zone***
250 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 4. | S05 | sewer lines |
| 6. | O08 | vehicle parking |
| 7. | T03 | major highways and railroads / Norfolk Southern railroad |
| 9. | I10 | storm water runoff |
| 13. | T03 | major highway Georgia Route 49 |
| 42. | B23 | knitting mill (historical, no longer present) |

## *Well #2 (continued)*

***Outer-Management Zone continued***

985 foot radius

*Note:* PPS's 1, 2, 4, 6, 7, 9, and 13 are also found in the Outer-Management Zone.

| PPS # | PPS Code | Description |
|---|---|---|
| 3. | T01 | access and secondary roads |
| 5. | S08 | water treatment facility (McLean water treatment plant) |
| 8. | T05 | railroad depot and loading platform |
| 10. | I13 | test well / monitoring well |
| 11. | W06 | garbage transfer stations / dumpsters |
| 12. | B23 | storage of paint, fuels, and oils |
| 16. | B02 | auto repair / body shop |
| 17. | B13 | laundromat / dry cleaner |
| 18. | B05 | car wash |
| 24. | B10 | gasoline station / service bay / engine repair / oil change |
| | F04 | underground fuel storage tank |
| 25. | B10 | gasoline station / service bay / oil change |
| | F04 | underground fuel storage tank |
| 26. | F04 | underground fuel storage tank |
| 27. | B14 | machine shop |
| 31. | A06 | fertilizer storage / liquid nitrogen storage tanks |
| 32. | A06 | fertilizer storage |
| 33. | F01 | above ground fuel storage tanks |
| 39. | I02 | domestic wells |
| 40. | H05 | hazardous waste NPL site |
| 41. | B14 | machine shop (historical, no longer present) |
| 42. | B23 | knitting mill (historical, no longer present) |
| 43. | B23 | power generating plant (historical, no longer present) |
| 44. | B13 | dry cleaners (historical, no longer present) |
| 45. | B17 | printers (historical, currently an unoccupied building) |
| 46. | B23 | cotton storage warehouse / rail transfer area (historical, no longer present) |
| 47. | B23 | cotton seed oil mill (historical, no longer present) |
| 51. | B23 | gasoline station (historical, no longer present) |
| 52. | B23 | gasoline station (historical, no longer present) |

## *Well #3*

***Control Zone***
15 foot radius
No Potential Pollution Sources

***Inner-Management Zone***
250 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 3. | T01 | access and secondary roads |
| 4. | S05 | sewer lines |
| 6. | O08 | vehicle parking |
| 11. | W06 | garbage transfer stations / dumpsters |
| 34. | S08 | water treatment facility (Jones Alley water treatment plant) |
| 38. | S01 | domestic septic system |

***Outer-Management Zone***
1100 foot radius

*Note:* PPS's 1, 2, 3, 4, 6, and 11 are also found in the Outer-Management Zone.

| PPS # | PPS Code | Description |
|---|---|---|
| 7. | T03 | major highways and railroads / Norfolk Southern railroad |
| 35. | F04 | underground fuel storage tanks |
| 36. | B13 | laundromat / dry cleaning |
| 37. | B23 | auto paint and body shop |
| 39. | I02 | domestic wells |

## *Well #4*

***Control Zone***
15 foot radius
No Potential Pollution Sources

***Inner-Management Zone***
250 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 3. | T01 | access and secondary roads |
| 4. | S05 | sewer lines |
| 6. | O08 | vehicle parking |
| 11. | W06 | garbage transfer stations / dumpsters |

***Outer-Management Zone***
1180 foot radius

*Note:* PPS's 1, 2, 3, 4, 6, and 11 are also found in the Outer-Management Zone.

| PPS # | PPS Code | Description |
|---|---|---|
| 7. | T03 | major highways and railroads / Norfolk Southern railroad |
| 34. | S08 | water treatment facility (Jones Alley water treatment plant) |
| 35. | F04 | underground fuel storage tanks |
| 36. | B13 | laundromat / dry cleaning |
| 37. | B23 | auto paint and body shop |
| 38. | S01 | domestic septic system |
| 39. | I02 | domestic wells |

## *Well #5*

***Control Zone***
15 foot radius
No Potential Pollution Sources

***Inner-Management Zone***
250 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 3. | T01 | access and secondary roads |
| 4. | S05 | sewer lines |
| 6. | O08 | vehicle parking |
| 9. | I10 | storm water runoff |
| 11. | W06 | garbage transfer stations / dumpsters |

***Outer-Management Zone***
1490 foot radius

*Note:* PPS's 1, 2, 3, 4, 6, 9 and 11 are also found in the Outer-Management Zone.

| PPS # | PPS Code | Description |
|---|---|---|
| 5. | S08 | water treatment facility (McLean) |
| 7. | T03 | major highways and railroads |
| 8. | T05 | railroad depot and loading platform |
| 10. | I13 | test well / monitoring well |
| 11. | W06 | garbage transfer stations / dumpsters |
| 12. | B23 | storage of paint, fuels, and oils |
| 13. | T03 | major highway Georgia Route 49 |
| 15. | T03 | major highway U.S. Route 341 |
| 16. | B02 | auto repair / body shop |
| 17. | B13 | laundromat / dry cleaner |
| 18. | B05 | car wash |
| 19. | B23 | tire and oil change |
| 20. | B23 | marine engine repair |
| 21. | B23 | auto detailing / car wash / window tinting |
| 22. | F04 | underground fuel storage tanks / diesel |
| 23. | F05 | abandoned underground fuel storage tanks |
| 24. | B10 | gasoline station / service bay / engine repair / oil change |
| | F04 | underground fuel storage tank |
| 25. | B10 | gasoline station / service bay / oil change |
| | F04 | underground fuel storage tank |
| 26. | F04 | underground fuel storage tank |
| 27. | B14 | machine shop |
| 28. | B02 | auto repair / fuel and oil change |

## *Well #5 (continued)*

*Outer-Management Zone continued*

| PPS # | PPS Code | Description |
|---|---|---|
| 29. | F05 | abandoned underground fuel storage tanks |
| | B05 | car wash |
| | B23 | oil change / window tinting and detail |
| 30. | B23 | tire / motor oil / fluid change |
| 31. | A06 | fertilizer storage / liquid nitrogen storage tanks |
| 32. | A06 | fertilizer storage |
| 33. | F01 | above ground fuel storage tanks |
| 39. | I02 | domestic wells |
| 40. | H05 | hazardous waste NPL site |
| 41. | B14 | machine shop (historical, no longer present) |
| 42. | B23 | knitting mill (historical, no longer present) |
| 43. | B23 | power generating plant (historical, no longer present) |
| 44. | B13 | dry cleaners (historical, no longer present)) |
| 45. | B17 | printers (historical, currently an unoccupied building) |
| 46. | B23 | cotton storage warehouse / rail transfer area (historical, no longer present) |
| 47. | B23 | cotton seed oil mill (historical, no longer present) |
| 48. | B13 | dry cleaners (historical, no longer present) |
| 49. | B13 | dry cleaners (historical, no longer present) |
| 50. | B13 | dry cleaners (historical, no longer present) |
| 51. | B23 | gasoline station (historical, no longer present) |
| 52. | B23 | gasoline station (historical, no longer present) |

# *Part 3: MANAGEMENT PLAN*

***Local Wellhead Protection Ordinance***

No

***Responsibilities of the Georgia Environmental Protection Division***

Within the Inner- and Outer-Management Zones EPD shall :

- not issue any new permits for municipal solid waste, industrial waste and construction/demolition waste landfills;
- not issue any new permits for the land disposal of hazardous wastes;
- require all new facilities permitted to handle, treat, store or dispose of hazardous waste or hazardous materials perform such operations on an impermeable pad having a spill and leak collection system;
- require all new agricultural waste impoundments have an impermeable synthetic liner;
- not issue any new permits for land application of waste water or sludge;
- not issue any new permits for underground injection wells;
- not issue permits for any new quarries or underground mines unless a hydrogeological investigation is completed;
- require all new underground storage tanks meet the highest standards applicable under the UST Act;
- require all new waste water treatment basins to have an impermeable synthetic liner.

***Recommendations to Local Governments from the Georgia Environmental Protection Division (EPD)***

EPD recommends that the local governments develop and adopt a local Wellhead Protection Ordinance.

PPS #1. PPS code O07 utility poles

The City of Fort Valley should be aware that telephone and utility poles are treated with coal tar creosote or other wood preservatives.

PPS #2. PPS code O04 electrical transformers

The City of Fort Valley should periodically check electrical transformers for cracks and leaks in the event of accidental or storm damage. Damaged transformers should be reported to the local utility provider.

PPS #3. PPS code T01 access and secondary roads

The City of Fort Valley should report all hazardous waste and petroleum product spills or releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

PPS #4. PPS code S05 sewer lines

The City of Fort Valley should properly maintain sewer lines and repair all sewer line breaks and leaks. In the event of a sewer line break or leak The City of Fort Valley should report the incident to the Georgia Department of Natural Resources, Water Protection Branch, Municipal Permitting Program, 4244 International Parkway, Suite 110, Atlanta, Georgia 30354, (404) 362-2680.

PPS #5. PPS code S08 water treatment facility (McLean water treatment plant)

The City of Fort Valley should operate the water treatment facility in accordance with permit conditions and report problems to the Georgia Environmental Protection Division, Water Resources Management Branch, Drinking Water Permitting Program, 205 Butler St. SE, Floyd Tower East, Suite 1358, Atlanta, Georgia 30334, (404) 656-5660.

***Recommendations to Local Governments from the Georgia EPD continued***

PPS #6. PPS code O08 vehicle parking

The City of Fort Valley should recommend residents and business owners restrict vehicle parking to designated paved areas where available.

PPS #7. PPS code T03 major highways and railroads / Norfolk Southern railroad

The City of Fort Valley should report all hazardous waste or petroleum product spills or releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

PPS #8. PPS code T05 railroad depot and loading platform

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #9. PPS code I10 storm water runoff

The City of Fort Valley should be aware that storm water runoff from parking areas may contain volatile organic compounds. Storm water runoff from residential areas may contain pesticides and fertilizers.

PPS #10. PPS code I13 test well / monitoring well

The City of Fort Valley should require the monitoring well be properly secured and maintained. After the monitoring well is abandoned the City of Fort Valley should require the well be properly grouted and plugged according to the specifications of Circular 13 Grouting and Plugging of Domestic Water Wells in Georgia, available through the Georgia Geologic Survey Publications Office (404) 657-6127.

PPS #11. PPS code W06 garbage transfer station / dumpsters

Garbage transfer stations are considered to be solid waste transfer stations. The City of Fort Valley should recommend businesses properly dispose of solid wastes. For more information contact the Solid Waste Management Program (404) 362-2692.

PPS #12. PPS code B23 storage for fuels, paint, and oils

The City of Fort Valley should use best management practices in the operation of their business. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #13. PPS code T03 major highways and railroads / Georgia Route 49

The City of Fort Valley should report all hazardous waste or petroleum product spills or releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

PPS #14. PPS code T03 major highways and railroads / Georgia Route 96

The City of Fort Valley should report all hazardous waste or petroleum product spills or releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

***Recommendations to Local Governments from the Georgia EPD continued***

PPS #15. PPS code T03 major highways and railroads / Georgia Route 341

The City of Fort Valley should report all hazardous waste or petroleum product spills or releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

PPS #16. PPS code B02 auto repair / body shop

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #17. PPS code B13 laundromat / dry cleaner

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Hazardous materials should be properly disposed of. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

PPS #18. PPS code B05 car wash

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #19. PPS code B23 tire and oil change

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #20. PPS code B23 marine engine repair

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #21. PPS code B23 auto detailing / car wash / window tinting

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

*Recommendations to Local Governments from the Georgia EPD continued*

PPS #22. PPS code F04 underground fuel storage tanks / diesel

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS #23. PPS code F05 abandoned underground fuel storage tank

The City of Fort Valley should recommend owners of underground storage tanks adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15-.11 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS #24. PPS code B10 gasoline station / service bay / engine repair / oil and fluid change

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS code F04 underground fuel storage tank

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS #25. PPS code B10 gasoline station / service bay / oil and fluid change

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS code F04 underground fuel storage tank

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

***Recommendations to Local Governments from the Georgia EPD continued***

PPS #26. PPS code F04 underground fuel storage tank

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS #27. PPS code B14 machine shop

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Hazardous materials should be properly disposed of. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

PPS #28. PPS code B02 auto repair / fuel and oil change

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #29. PPS code F05 abandoned underground fuel storage tanks

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS code B05 car wash

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS code B23 oil change / window tinting and detail

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #30. PPS code B23 tire / motor oil / fluid change

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

***Recommendations to Local Governments from the Georgia EPD continued***

PPS #31. PPS code A06 fertilizer storage

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Liquid fertilizer should have a spill containment system. Spills should be reported to the Department of Natural Resources at 1-800-241-4133. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

PPS #32. PPS code A06 fertilizer storage

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

PPS #33. PPS code F01 above ground fuel storage tank

The City of Fort Valley should recommend businesses have a spill containment system large enough to contain the entire volume of material. Petroleum product spills or releases should be reported to the Department of Natural Resources at 1-800-241-4133. For more information concerning above ground fuel storage tanks contact the Georgia Office of Commissioner of Insurance, State Fire Marshall, Hazardous Materials, (404) 656-9798.

PPS #34. PPS code S08 water treatment facility (Jones Alley)

The City of Fort Valley should operate the water treatment facility in accordance with permit conditions and report problems to the Georgia Environmental Protection Division, Water Resources Management Branch, Drinking Water Permitting Program, 205 Butler St. SE, Floyd Tower East, Suite 1358, Atlanta, Georgia 30334, (404) 656-5660.

PPS #35. PPS code F04 underground fuel storage tanks

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS #36. PPS code B13 laundromat / dry cleaning

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Hazardous materials should be properly disposed of. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

PPS #37. PPS code B23 auto paint and body shop

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils, fluids, and paints should be properly disposed . A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Dr., Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

***Recommendations to Local Governments from the Georgia EPD continued***

PPS #38. PPS code S01 domestic septic system

The City of Fort Valley should recommend home owners properly operate and maintain their septic system. Contact the Peach County Health Department for more information concerning proper septic tank operation and maintenance.

PPS #39. PPS code I02 domestic wells

The City of Fort Valley should recommend property owners protect their own wells from pollutants. Well owners should periodically test for water quality. If problems are identified by the water test, contact a water treatment specialist for recommendations. For more information contact the Georgia Cooperative Extension Service Branch office in Peach County.

The City of Fort Valley should recommend property owners properly grout and plug abandoned wells according to the specifications of Circular 13 Grouting and Plugging of Domestic Water Wells in Georgia, available through the Georgia Geologic Survey Publications Office (404) 657-6127. For more information contact the Department of Natural Resources, Georgia Geologic Survey, 19 Martin Luther King Jr. Dr. SW, Atlanta, Georgia, 30334 (404) 656-3214.

PPS #40. PPS code H05 hazardous waste NPL location

The hazardous waste clean up activities are currently under the direction of the Georgia Department of Natural Resources, Hazardous Waste Management Branch. For more information contact the Department of Natural Resources, Hazardous Waste Management Branch, 205 Butler Street, S.E., Floyd Towers East, Suite 1154, Atlanta, Georgia, 30334 (404) 656-7802.

PPS #41. PPS code B14 machine shop (historical, no longer present)

Historical information. The machine shop was in operation during the 1920's.

PPS #42. PPS code B23 knitting mill (historical, no longer present)

Historical information. The knitting mill was destroyed by a tornado in 1975.

PPS #43. PPS code B23 power generating plant (historical, no longer present)

Historical information. The power plant used to be in the same location currently occupied by McLean water treatment plant.

PPS #44. PPS code B13 dry cleaners (historical, no longer present)

Historical information. The dry cleaners used to be in the same location currently occupied by Splish Splash car wash.

PPS #45. PPS code B17 printers (historical, currently an unoccupied building))

Historical information. The printing company has moved from this location.

PPS #46. PPS code B23 cotton storage warehouse / rail transfer area (historical, no longer present)

Historical information. The cotton storage warehouse / rail transfer area was removed and the location is now a vacant lot. Remnants of the track are still evident.

PPS #47. PPS code B23 cotton seed oil mill (historical, no longer present)

Historical information. The cotton storage warehouse / rail transfer area was removed and the location is now a vacant lot.

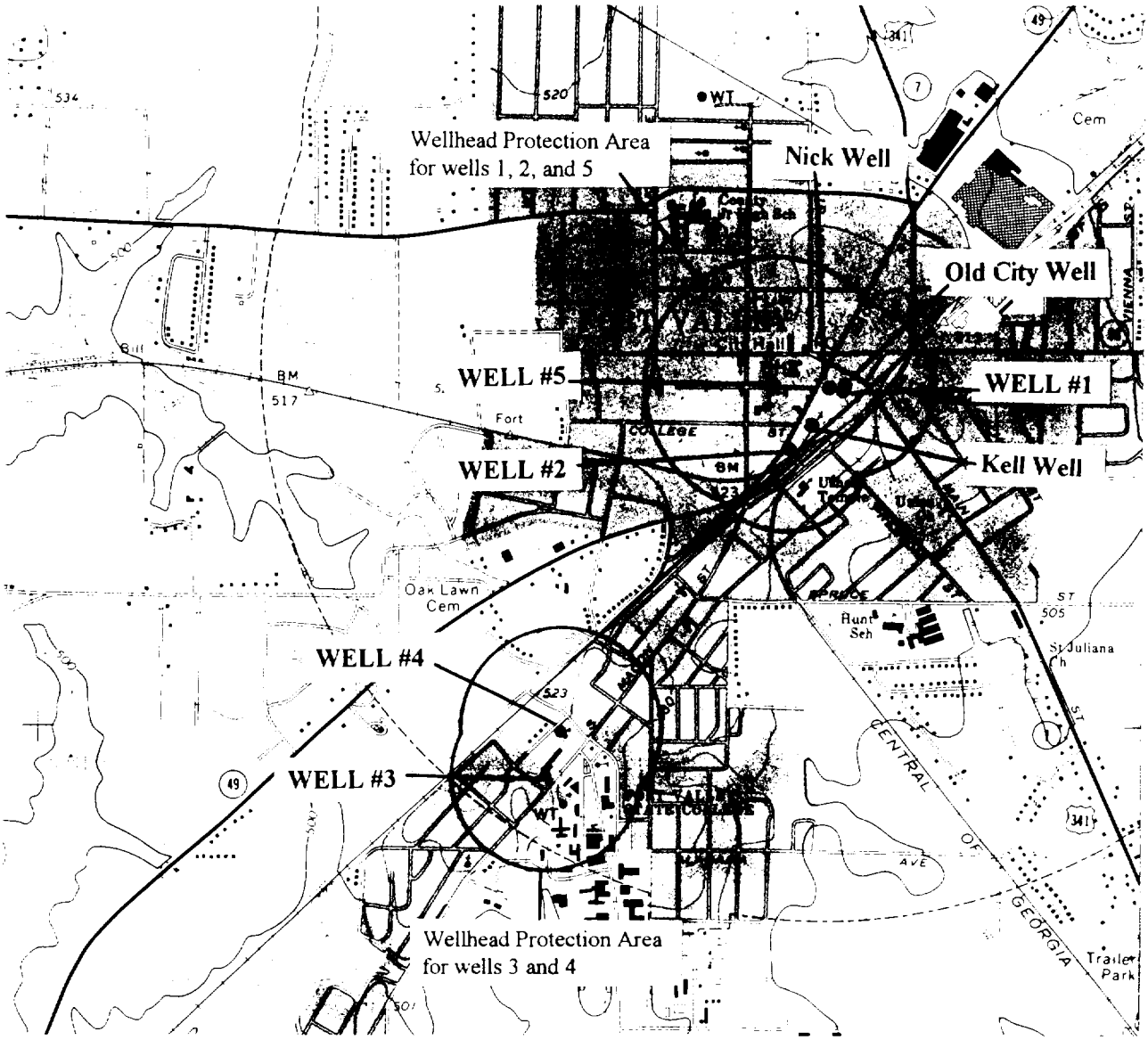
***Recommendations to Local Governments from the Georgia EPD continued***

PPS #48. PPS code B13 dry cleaners (historical, no longer present)
Historical information.
PPS #49. PPS code B13 dry cleaners (historical, no longer present)
Historical information.
PPS #50. PPS code B13 dry cleaners (historical, no longer present)
Historical information.
PPS #51. PPS code B23 gasoline station (historical, no longer present)
Historical information.
PPS #52. PPS code B23 gasoline station (historical, no longer present)
Historical information.

## *Part 4: CONTINGENCY PLAN*

The City of Fort Valley has five connected wells. In the event one of the wells can no longer be used the other wells will supply the communities water needs until the well is operational or a new water source can be found.

# City of Fort Valley
# Wellhead Protection Areas

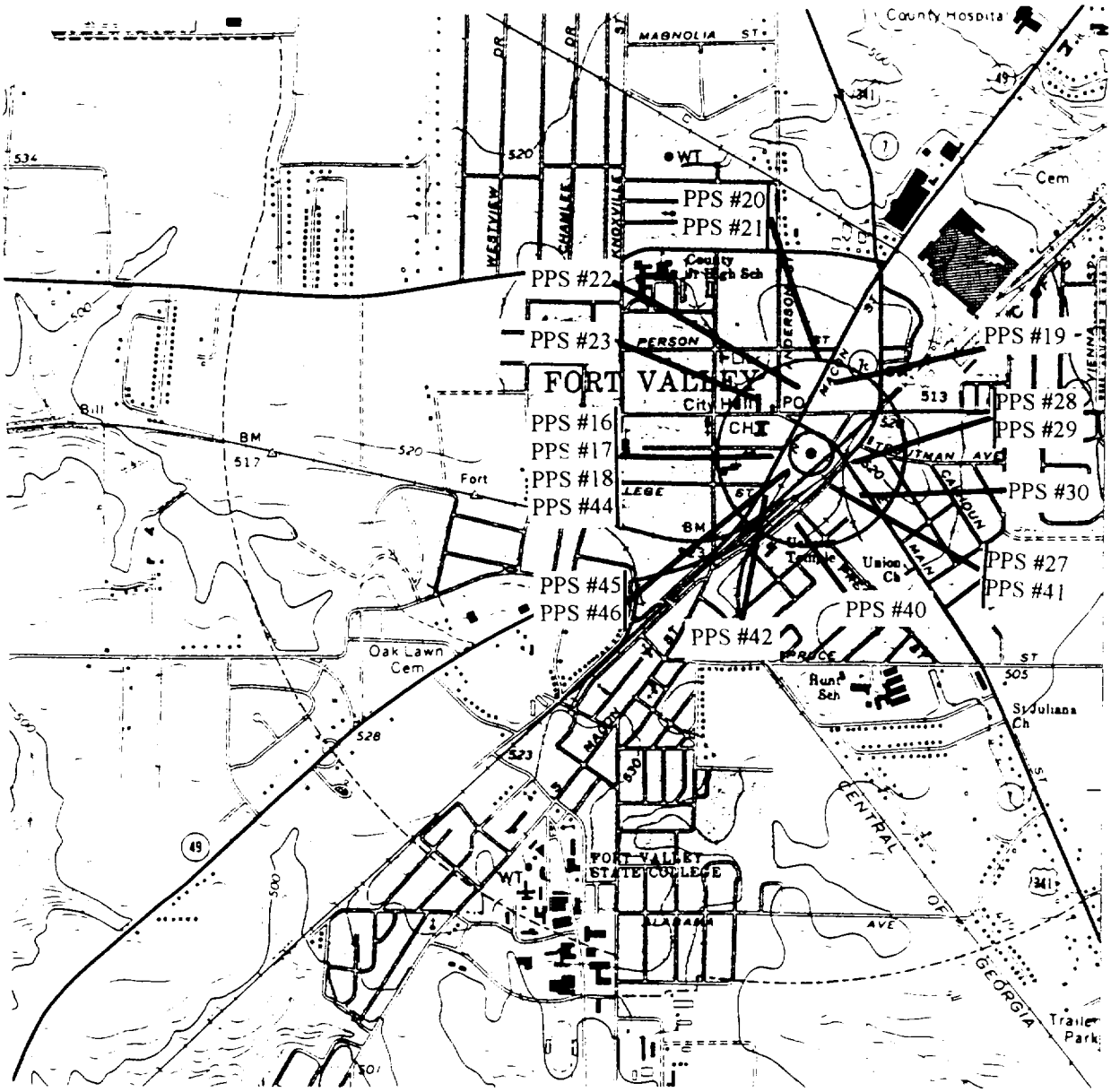



*Quadrangle:* Fort Valley West

| | Well #1 | Well #2 | Well #3 | Well #4 | Well #5 |
|---|---|---|---|---|---|
| *Longitude:* | 83° 53' 10.3"W | 83° 53' 18.5"W | 83° 53' 50.6"W | 83° 53' 49.7"W | 83° 53' 19.5"W |
| *Latitude:* | 32° 33' 09.5"N | 32° 33' 02.3"N | 32° 32' 24.3"N | 32° 32' 29.5"N | 32° 33' 10.6"N |
| *CZ:* | 15 foot radius | 15 foot radius | 15 foot radius | 15 foot radius | 15 foot radius |
| *IMZ:* | 250 foot radius | 250 foot radius | 250 foot radius | 250 foot radius | 250 foot radius |
| *Omz:* | 1055 foot radius | 985 foot radius | 1100 foot radius | 1180 foot radius | 1490 foot radius |

| | Kell Well | Nick Well | Old City Well |
|---|---|---|---|
| *Longitude:* | 83° 53' 15.0"W | 83° 53' 12.3"W | 83° 53' 09.9"W |
| *Latitude:* | 32° 33' 05.5"N | 32° 33' 09.1"N | 32° 33' 09.6"N |
| *Status:* | abandoned | abandoned | abandoned |

# City of Fort Valley
## Well #1
## Wellhead Protection Area

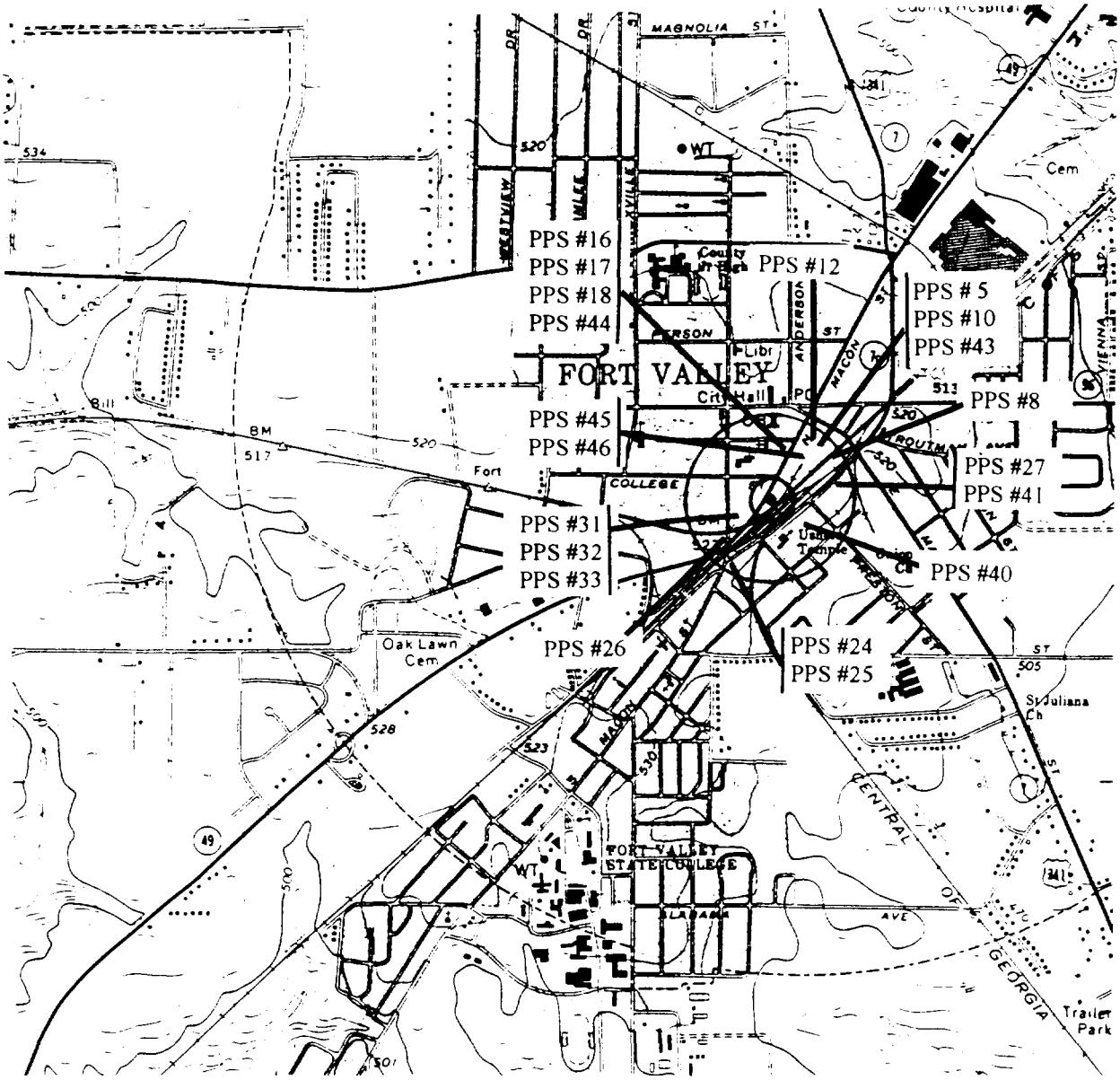



| | |
|---|---|
| *Quadrangle:* | Fort Valley West |
| *Longitude:* | 83° 53' 10.3"W |
| *Latitude:* | 32° 33' 09.5"N |
| *Control Zone:* | 15 foot radius |
| *Inner- Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1055 foot radius |

Potential Pollution Sources (PPS) of the IMZ are not shown on this map

Potential Pollution Sources (PPS) not shown on this map are listed on pages 11 and 12

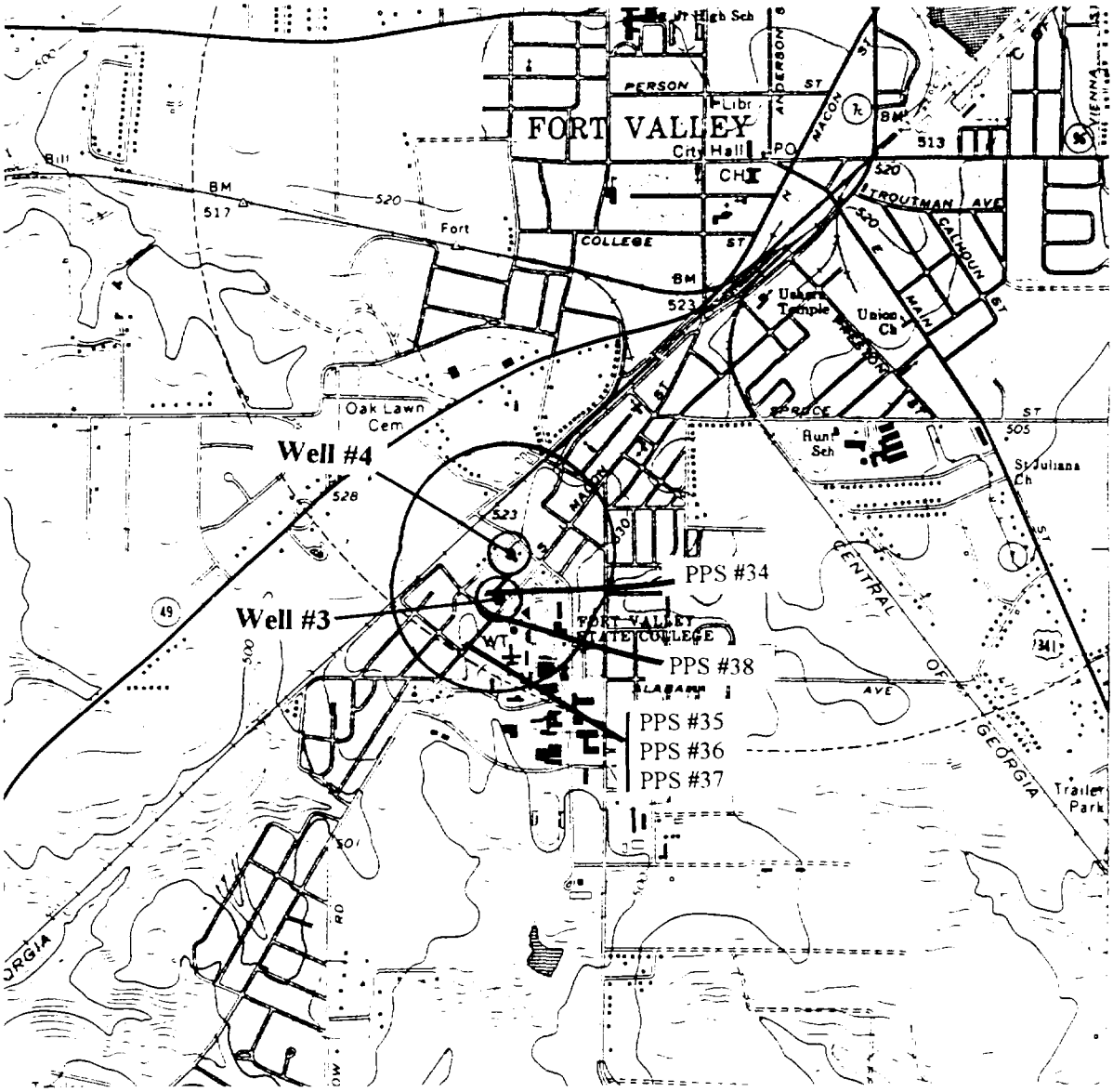
# City of Fort Valley
# Well #2
# Wellhead Protection Area




| | |
|---|---|
| *Quadrangle:* | Fort Valley West |
| *Longitude:* | 83° 53' 18.5"W |
| *Latitude:* | 32° 33' 02.3"N |
| *Control Zone:* | 15 foot radius |
| *Inner- Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 985 foot radius |

Potential Pollution Sources (PPS) of the IMZ are not shown on this map
Potential Pollution Sources (PPS) not shown on this map are listed on page 12 and 13

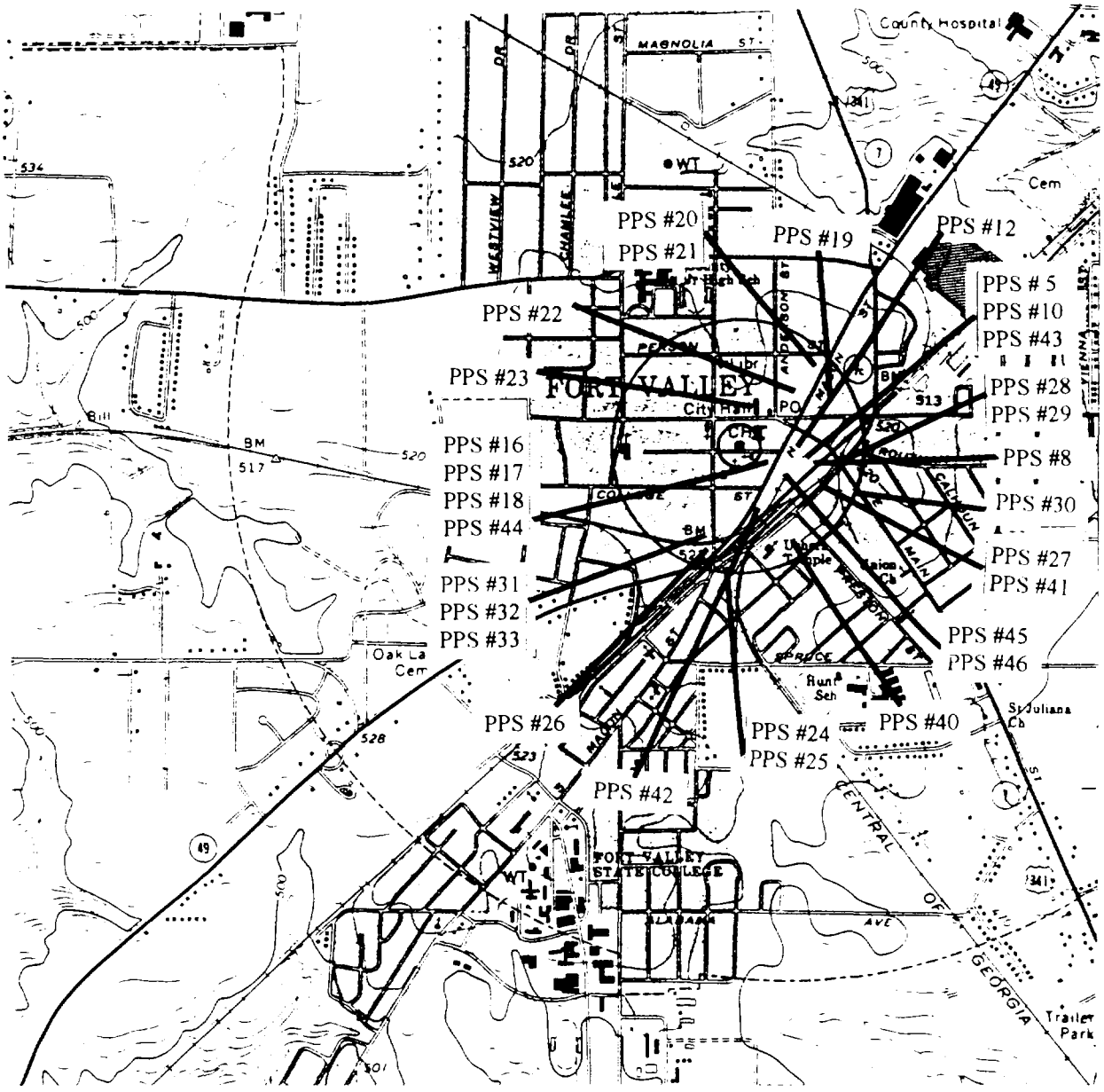
City of Fort Valley
Wells #3 and #4
Wellhead Protection Area




| | Well #3 | Well #4 |
|---|---|---|
| *Quadrangle:* | Fort Valley West | Fort Valley West |
| *Longitude:* | 83° 53' 50.6"W | 83° 53' 49.7"W |
| *Latitude:* | 32° 32' 24.3"N | 32° 32' 29.5"N |
| *Control Zone:* | 15 foot radius | 15 foot radius |
| *Inner-Management Zone:* | 250 foot radius | 250 foot radius |
| *Outer-Management Zone:* | 1100 foot radius | 1180 foot radius |

Potential Pollution Sources (PPS) not shown on this map are listed on pages 14 and 15

# City of Fort Valley
# Well #5
# Wellhead Protection Area




| | |
|---|---|
| *Quadrangle:* | Fort Valley West |
| *Longitude:* | 83° 53' 19.5"W |
| *Latitude:* | 32° 33' 10.6"N |
| *Control Zone:* | 15 foot radius |
| *Inner- Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1490 foot |

Potential Pollution Sources (PPS) of the IMZ are not shown on this map
Potential Pollution Sources (PPS) not shown on this map are listed on pages 16 and 17

# Radius Calculations for identifying the Outer-Management Zone

VOLUMETRIC FLOW EQUATION

$$R = \sqrt{\frac{QT}{\pi n H}}$$

R = WHPA RADIUS
Q = PUMPING RATE OF WELL
n = AQUIFER POROSITY
H = OPEN INTERVAL (NO GROUT) OR
LENGTH OF WELL SCREEN
T = TRAVEL TIME TO WELL

## Well #1

Q = 1000 gpm
n = 0.25
H = 402 feet
T = 5 years
R = 1,055 feet

## Well #2

Q = 1000 gpm
n = 0.25
H = 461 feet
T = 5 years
R = 985 feet

## Well #3

Q = 1000 gpm
n = 0.25
H = 372 feet
T = 5 years
R = 1,100 feet

## Well #4

Q = 1350 gpm
n = 0.25
H = 433 feet
T = 5 years
R = 1,180 feet

## Well #5

Q = 1500 gpm
n = 0.25
H = 303 feet
T = 5 years
R = 1,490 feet

# APPENDIX A
# INVENTORY OF POTENTIAL POLLUTION SOURCES

**AGRICULTURE**
A01 Agricultural Fields
A02 Agriculture Waste Impoundments
A03 Animal Burials
A04 Animal Feed Lots
A05 Commercial Animal Enclosures
A06 Fertilizer/Pesticide Storage
A07 Grain Storage Bins
A08 Irrigation Wells
A09 Pesticide Mixing Areas
A10 Other

**BUSINESS AND INDUSTRY**
B01 Asphalt Plant
B02 Auto Repair/Body Shop/Salvage Washes
B03 Auto/Truck/Boat/Equipment Dealers
B04 Business using Solvents/Paints
B05 Car Wash
B06 Chemical Production/Mixing/Storage
B07 Deicing Applications
B08 Electroplaters/Metal Finishers
B09 Fleet Service Facility
B10 Gasoline Station Service Bay
B11 Golf Courses/Nurseries
B12 Industrial Facilities
B13 Laundromats/Dry Cleaners
B14 Machine Shops
B15 Photo Processors
B16 Power Generating Facilities
B17 Printers
B18 Refineries
B19 Refinishing
B20 Salvage Operations
B21 Stockpiles
B22 Wood Chemical Treatment Facilities
B23 Other

**FUEL STORAGE**
F01 Above Ground Storage Tanks
F02 Fuel Storage Facility
F03 Oil/Gas Pipeline
F04 Underground Storage Tanks
F05 Other

**HAZARDOUS MATERIALS**
H01 Facilities Handling Hazardous Waste
H02 Hazardous Waste Disposal
H03 Hazardous Waste Management Units
H04 Radioactive Disposal and Storage
H05 Other

**INJECTION AND INFILTRATION**
I01 Abandoned Wells
I02 Domestic Wells
I03 Drainage Canals
I04 Holding Pond/Lagoon
I05 Infiltration Galleries
I06 Injection Wells
107 Neighboring Polluted Wells
I08 Salt Water Intrusion/Upconing
I09 Sinkholes Modified/Natural
I10 Storm Water Runoff/Infiltration
I11 Swamps/Wetlands/Flood plain
I12 Urban Runoff
I13 Other

**KNOWN POLLUTION**
P01 Accident Spill Locations
P02 Hazardous Waste Sites
P03 Other

**LANDFILLS**
L01 Construction Waste Landfills
L02 Industrial Waste Landfills
L03 Municipal Solid Waste Landfills
L04 Others, Active or Abandoned

**MINING AND CONSTRUCTION**
M01 Borrow Pits
M02 Construction Excavations
M03 Detonation Sites
M04 Mining Operations
M05 Quarries/Underground Mines
M06 Other

**SEWAGE AND WATER TREATMENT**
S01 Domestic Septic Systems
S02 Lift Station
S03 Non-Domestic Septic Systems
S04 Sewage Treatment Plant
S05 Sewer Lines
S06 Treatment Lagoons/Ponds
S07 Waste Water Treatment Basin
S08 Water Treatment Facilities
S09 Other

**TRANSPORTATION**
T01 Access and Secondary Roads
T02 Airports
T03 Major Highways and Railroads
T04 Transportation Corridors
T05 Other

**WASTE DISPOSAL SITES**
W01 Abandoned Disposal Site
W02 Abandoned Drums
W03 Cesspools
W04 Drum Storage/Disposal/Recycling
W05 Dumps
W06 Garbage Transfer Stations
W07 Land Application Systems
W08 Open Pit Burning
W09 Recycling Facilities
W10 Sludge Application
W11 Sludge Producing Facility
W12 Waste Piles
W13 Other

**OTHER**
O01 Atmospheric Pollution Percolation
O02 Abandoned Cars/Vehicles
O03 Cemeteries
O04 Electrical Transformers
O05 Military Base/Depot
O06 Utility Corridors
O07 Utility Poles
O08 Vehicle Parking Areas
O09 Other

Rev:11/28/94 sjr

# APPENDIX 5

Georgia Department of Natural Resources
205 Butler Street, S.E., Suite 1162 Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Environmental Protection Division
Harold F. Reheis, Director
404/656-2833 404/656-7802

November 4, 1997

**TRIP REPORT (SI Reconnaissance)**

**SITE NAME & LOCATION:** Anthoine Machine Works

**TRIP BY:** Bob Pierce

**ACCOMPANIED BY:** Steve White
Eddie Williams
Thomas Williams

**DATE OF TRIP:** October 29, 1997

**OFFICIALS CONTACTED:** Mr. Steven W. Lindsey, President (912-825-5613)

**REFERENCE:** Site Investigation (SI) Site Reconnaissance & Sampling Trip

**COMMENTS:**

Arrived at the site 2:20 PM and presented credentials. Anthoine Machine Works (the site) is located at the intersection of Railroad and Preston Streets in down town Fort Valley. The site is in an industrial district. It is bounded to the north by the Central of Georgia Railroad, the south by Woolfolk Chemical Works, the east by an open field, and the west by industrial buildings. The site is active and is surrounded by a fence with three locking gates. The gate on Preston Street was observed with observed always to be locked. The two gates on Railroad Street are open during business hours but are kept locked at night.

After checking in with Mr. Lindsey, we proceeded to take soil core samples with a Model 5400 GeoProbe soil boring machine mounted in the bed of a pickup truck. Only soil samples were taken because the presence of ground water containing Perchloroethelyene (Perc) had been established in EPA's on-going Superfund investigation of the Woolfolk Chemical Works site which is located at the southern boundary of the machine works. If soil contamination were to be found at depth immediately below the machine works, then

it may be possible to attribute at least a portion of the Perc found in Fort Valley City wells 1 and 2 to Anthoine Machine Works.

Soil Sample Descriptions

| Sample No. | Sample Interval (Feet BLS) | Description | Comments |
|---|---|---|---|
| 1 | 12 -14 | Red clay, some sand | No PID Hits* |
| 2 | 10 -12 | Plastic red clay | No PID Hits* |
| 3 | 12 - 16 | Plastic red clay (moist) | No PID Hits* |
| 4 | 5 - 6 | Plastic red clay (moist) | No PID Hits* |
| *PID was run continuously during entire coring operation and did not register above background. | | | |

**RECOMMENDATIONS & FOLLOW UP REQUIRED:**

If the laboratory results show the presence of Perc, then more investigation will be required.

**PHOTOGRAPHS:** None

**SAMPLES:** Four

**ATTACHMENTS:** Sample location map

# APPENDIX 6

# SITE INSPECTION WORKSHEETS

| CERCLIS IDENTIFICATION NUMBER |
|---|
| GA0001020874 |

| SITE LOCATION | | | |
|---|---|---|---|
| SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE<br>Anthoine Machine Works | | | |
| STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFIER<br>311 Railroad Street | | | |
| CITY<br>Fort Valley | STATE<br>GA | ZIP CODE<br>31030 | TELEPHONE<br>(912) 825-5610 |
| COORDINATES: LATITUDE and LONGITUDE<br>32°33'04.8" N 83°53'09.3" W | TOWNSHIP, RANGE, AND SECTION | | |

| OWNER/OPERATOR IDENTIFICATION | | | | | |
|---|---|---|---|---|---|
| OWNER<br>Steven W. Lindsey | | | OPERATOR | | |
| OWNER ADDRESS<br>Same as Above | | | OPERATOR ADDRESS | | |
| CITY | | | CITY | | |
| STATE | ZIP CODE | TELEPHONE<br>( ) | STATE | ZIP CODE | TELEPHONE<br>( ) |

| SITE EVALUATION | | |
|---|---|---|
| AGENCY/ORGANIZATION<br>Georgia DNR- EPD | | |
| INVESTIGATOR<br>Robert Pierce | | |
| CONTACT<br>Steve White | | |
| ADDRESS<br>205 Butler St, SW Rm 1154 E. | | |
| CITY<br>Atlanta | STATE<br>GA | ZIP CODE<br>30334 |
| TELEPHONE<br>(404) 656-2833 | | |

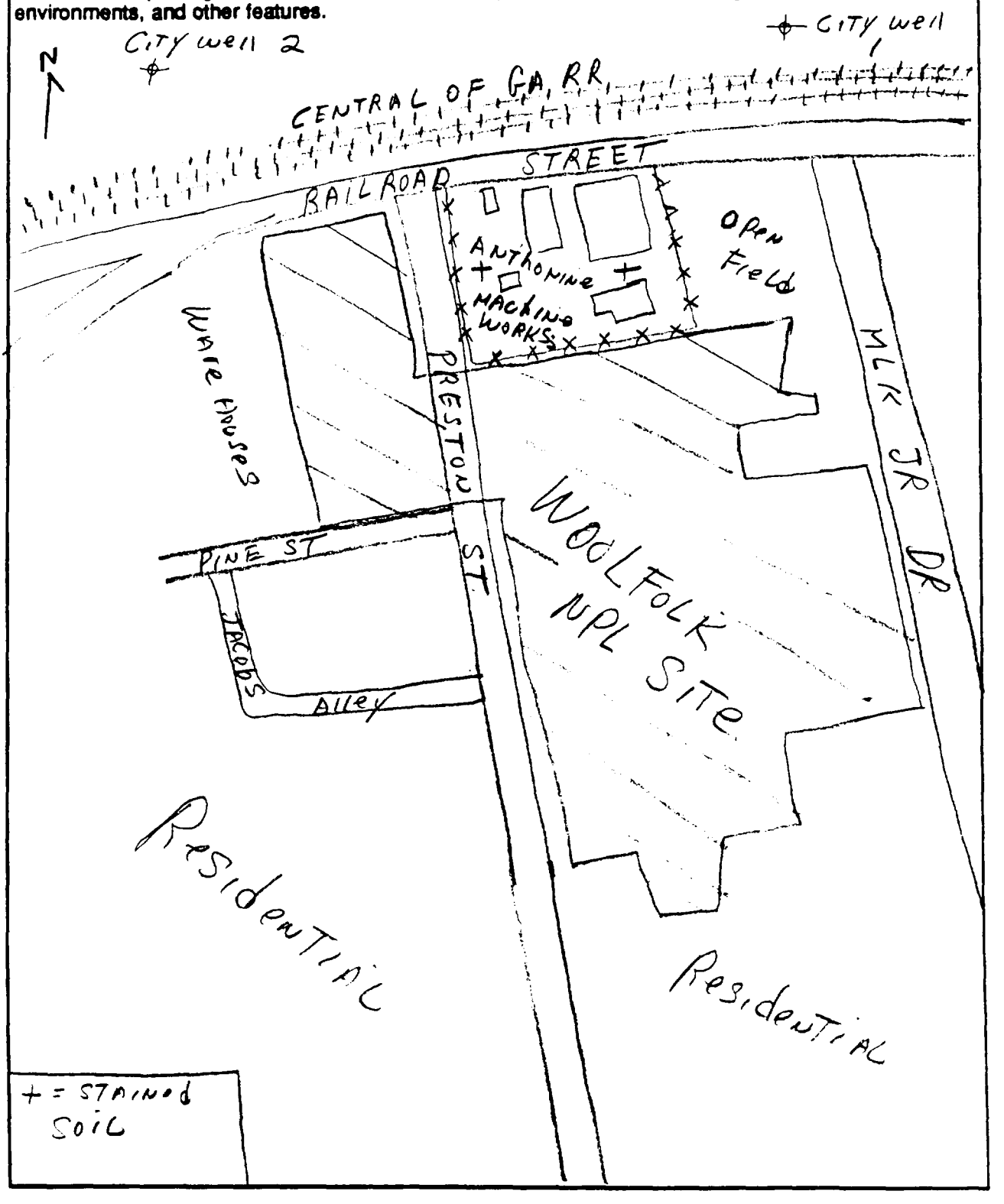
## GENERAL INFORMATION

**Site Description and Operational History**:

Anthoine Machine Works has been at this site since 1975. The original facility shown in a 1930 Sanborn Fire Insurance Map was at the southeast corner of Preston and Railroad Streets approximately 200 feet southwest of its present location (Reference 11). Other facilities located at this site were a saw mill and a planing mill (Reference 12). These industries are no longer there and only the machine shop remains at the site. The site is active and machining operations and are the only activities conducted at the site. The site currently has 5 buildings with the largest being the machine shop, and the other 4 used for storage or work areas. Present waste operations are limited to parts washing at a small cleaning station with waste solvents removed by a hazardous waste transporter company. The present operator of the site is Mr. Steven W. Lindsey. The site measures approximately 235' x 250' and is fenced. The facility is a conditionally exempt small quantity generator (Reference 14).

## GENERAL INFORMATION (continued)

**Site Sketch:** Provide a sketch of the site. Indicate all pertinent features of the site and nearby environments including sources of wastes, areas of visible and buried wastes, buildings, residences, access roads, parking areas, fences, fields, drainage patterns, water bodies, vegetation, wells, sensitive environments, and other features.



GENERAL INFORMATION

**Source Description**

The Contaminant of concern is Perchloroethelyene (Perc) which is a common solvent used in parts washing and dry cleaning. Perc has been found above the MCL in Fort Valley Municipal Wells 1 and 2. The most probable pathway for Perc to get from the Site to City wells 1 and 2 would be through soil infiltration as a result such possible occurrences as past spills and/or improper disposal practices. Any Perc migrating through the soil may find its way to the ground water by migration either through structural or lithologic inhomogeneities in the clay strata or through abandoned wells.

**Hazardous Waste Quantity (HWQ) Calculation**

The source type would be contaminated soil. Since the site has been used as a machine shop for about 100 years, all the soil within the fenced boundary was considered potentially contaminated. The site measures 235 x 250 feet or 58,750 $ft^2$ contaminated soil. SI Table 1 states that a contaminated soil area of $\leq$ 3.4 million $ft^2$ has a HWQ of 10. However, since actual contamination targets exist, the HWQ default is 100.

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## SI TABLE 1: HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

| | | Single Source Sites (assigned HWQ scores) | |
|---|---|---|---|
| (Column 1)<br>TIER | (Column 2)<br>Source Type | (Column 3)<br>HWQ = 10 | (Column 4)<br>HWQ = 100 |
| **A**<br>Hazardous Constituent Quantity | N/A | HWQ = 1 if Hazardous Constituent Quantity data are complete<br><br>HWQ = 10 if Hazardous Constituent Quantity data are not complete | >100 to 10,000 lbs |
| **B**<br>Hazardous Wastestream Quantity | N/A | ≤ 500,000 lbs | >500,000 to 50 million lbs |
| **C**<br>Volume | Landfill | ≤ 6.75 million $ft^3$<br>≤ 250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ |
| | Surface impoundment | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| | Drums | ≤1,000 drums | >1,000 to 100,000 drums |
| | Tanks and non-drum containers | ≤50,000 gallons | >50,000 to 5 million gallons |
| | Contaminated soil | ≤6.75 million $ft^3$<br>≤250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ |
| | Pile | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| | Other | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| **D**<br>Area | Landfill | ≤340,000 $ft^2$<br>≤7.8 acres | >340,000 to 34 million $ft^2$<br>>7.8 to 780 acres |
| | Surface impoundment | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres |
| | Contaminated soil | ≤3.4 million $ft^2$<br>≤78 acres | > 3.4 million to 340 million $ft^2$<br>> 78 to 7,800 acres |
| | Pile | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres |
| | Land treatment | ≤27,000 $ft^2$<br>≤0.62 acres | >27,000 to 2.7 million $ft^2$<br>>0.62 to 62 acres |

## SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

**Site Name:** ANTOINE MACHINE WORKS

**References** _____

**Sources:** NONE

1. ~~CONTAMINATED SOIL~~
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 

| SOURCE | HAZARDOUS SUBSTANCE | TOXICITY | GROUND WATER PATHWAY | | SURFACE WATER PATHWAY | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | OVERLAND/FLOOD MIGRATION | | | | | | | GROUND WATER TO SURFACE WATER | | | |
| | | | GW Mobility (HRS Table 3-8) | Tox/ Mobility Value (HRS Table 3-9) | Per (HRS Tables 4-10 and 4-11) | Tox/Per Value (HRS Table 4-12) | Bioac Pot. (HRS Table 4-15) | Tox/ Pers/ Bioac Value (HRS Table 4-16) | Ecotox (HRS Table 4-19) | Ecotox/ Pers (HRS Table 4-20) | Ecotox/ Pers/ Bioacc Value (HRS Table 4-21) | Tox/ Mob/ Pers Value (HRS Table 4-26) | Tox/ Mob/ Pers/ Bioacc Value (HRS Table 4-28) | Ecotox/ Mob/ Pers Value (HRS Table 4-29) | Ecotox/ Mob/ Per/ Bioacc Value (HRS Table 4-30) |
| | PERC | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
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### Ground Water Observed Release Substances Summary Table

On SI Table 4, list the hazardous substances associated with the site detected in ground water samples for that aquifer. Include only those substances directly observed or with concentrations significantly greater than background levels. Obtain toxicity values from the Superfund Chemical Data Matrix (SCDM). Assign mobility a value of 1 for all observed release substances regardless of the aquifer being evaluated. For each substance, multiply the toxicity by the mobility to obtain the toxicity/mobility factor value; enter the highest toxicity/mobility value for the aquifer in the space provided.

### Ground Water Actual Contamination Targets Summary Table

If there is an observed release at a drinking water well, enter each hazardous substance meeting the requirements for an observed release by well and sample ID on SI Table 5 and record the detected concentration. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population using the well as a Level I target. If these percentages are less than 100% or all are N/A, evaluate the population using the well as a Level II target for that aquifer.

## SI TABLE 4: GROUND WATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

| Sample ID | Hazardous Substance | Bckgrd. Conc. | Toxicity/ Mobility | References |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | Highest Toxicity/Mobility | | |

## SI TABLE 5: GROUND WATER ACTUAL CONTAMINATION TARGETS

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

## GROUND WATER PATHWAY
## GROUND WATER USE DESCRIPTION

**Describe Ground Water Use within 4 Miles of the Site:**
Describe generalized stratigraphy, aquifers, municipal and private wells

**Show Calculations of Ground Water Drinking Water Populations for each Aquifer:**
Provide apportionment calculations for blended supply systems.
County average number of persons per household: _____ Reference _____

## GROUND WATER USE PATHWAY
## GROUND WATER USE DESCRIPTION

Describe Ground Water Use within 4 Miles of the Site:

The stratigraphy of the area consists of inter bedded layers of sand, sandy clay, and kaolin clay which range in age from the Upper Cretaceous to the Lower Paleocene (References 2 and 3). The shallow most aquifer is the Clayton which is a sandy clay underlain by a fairly continuous layer of kaolin clay which serves as the lower confining unit for this aquifer. Ground water in the Clayton aquifer occurs under water table conditions and is about 20-30 feet below land surface. The main aquifer in the Fort Valley area is the Tuscaloosa which is about 250 feet below land surface. This aquifer is overlain by the Ripley/Blufftown - Eutaw semiconfining unit. The Tuscaloosa is the aquifer utilized by the public water supply wells in the area. The City of Fort Valley supplies water from the Tuscaloosa aquifer to about 8200 people utilizing 5 wells pumping to a single distribution system. City Wells 1, 2 and 5 are within 1/4 mile of the site. City wells 3 and 4 are within 2 miles of the site. The only other known public water supply within 4 miles of the site is Collins Mobile Home Park (one well)which is about 2.8 miles west of the site (Figure 3).

**Show Calculations of Ground Water Drinking Water Populations for Each Aquifer:**

The aquifer in the Fort Valley area most utilized as a source of drinking water is the Tuscaloosa aquifer. There are no known blended supply systems within the 4 mile target area.

# GROUND WATER PATHWAY WORKSHEET

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4. | | | |
| 2. POTENTIAL TO RELEASE: Depth to aquifer: 20 feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3. | 340 | | |
| LR = | 340 | | |

| TARGETS | | | |
|---|---|---|---|
| Are any wells part of a blended system? Yes____ No ✓<br>If yes, attach a page to show apportionment calculations. | | | |
| 3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5).<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ **Total =** | N/A | | |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1. | 142 | | |
| 5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles, assign 0. | 20 | | |
| 6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a ground water observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0. | 20 | | |
| 7. RESOURCES: Assign a score of 5 if one or more ground water resource applies; assign 0 if none applies.<br><br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering of commercial livestock<br>• Ingredient in commercial food preparation<br>• Supply for commercial aquaculture<br>• Supply for a major or designated water recreation area, excluding drinking water use | 0 | | |
| **Sum of Targets T=** | 182 | | |

## SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS

### SI Table 6a: Other Than Karst Aquifers

| Distance from Site | Pop. | Nearest Well (choose highest) | Population Served by Wells within Distance Category | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to $\frac{1}{4}$ mile | 69 | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | 53 | |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | 114 | 18 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | 102 | |
| > $\frac{1}{2}$ to 1 mile | 573 | 9 | 1 | 5 | 17 | 52 | 167 | 523 | 1,669 | 5,224 | 16,684 | 52,239 | 166,835 | 522,385 | 167 | |
| > 1 to 2 miles | 2310 | 5 | 0.7 | 3 | 10 | 30 | 94 | 294 | 939 | 2,939 | 9,385 | 29,384 | 93,845 | 293,842 | 294 | |
| > 2 to 3 miles | 3308 | 3 | 0.5 | 2 | 7 | 21 | 68 | 212 | 678 | 2,122 | 6,778 | 21,222 | 67,777 | 212,219 | 678 | |
| >3 to 4 miles | 2977 | 2 | 0.3 | 1 | 4 | 13 | 42 | 131 | 417 | 1,306 | 4,171 | 13,060 | 41,709 | 130,596 | 131 | |

**Nearest Well =** 20 **Sum =** 1425

## SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS (continued)

### SI Table 6b: Karst Aquifers

| Distance from Site | Pop. | Nearest Well (choose highest) | Population Served by Wells within Distance Category | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to $\frac{1}{4}$ mile | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | | |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | | 20 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | | |
| > $\frac{1}{2}$ to 1 mile | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| > 1 to 2 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| > 2 to 3 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| >3 to 4 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |

**Nearest Well =** [ ]

**Sum =** [ ]

## GROUND WATER PATHWAY WORKSHEET (concluded)

| WASTE CHARACTERISTICS | Score | Data Type | Does not Apply |
|---|---|---|---|
| 8. If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to ground water. | 100 | | |
| 9. Assign the highest ground water toxicity/mobility value from SI Table 3 or 4. | 0 | | |
| 10. Multiply the ground water toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7) | | | |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

WC = 0

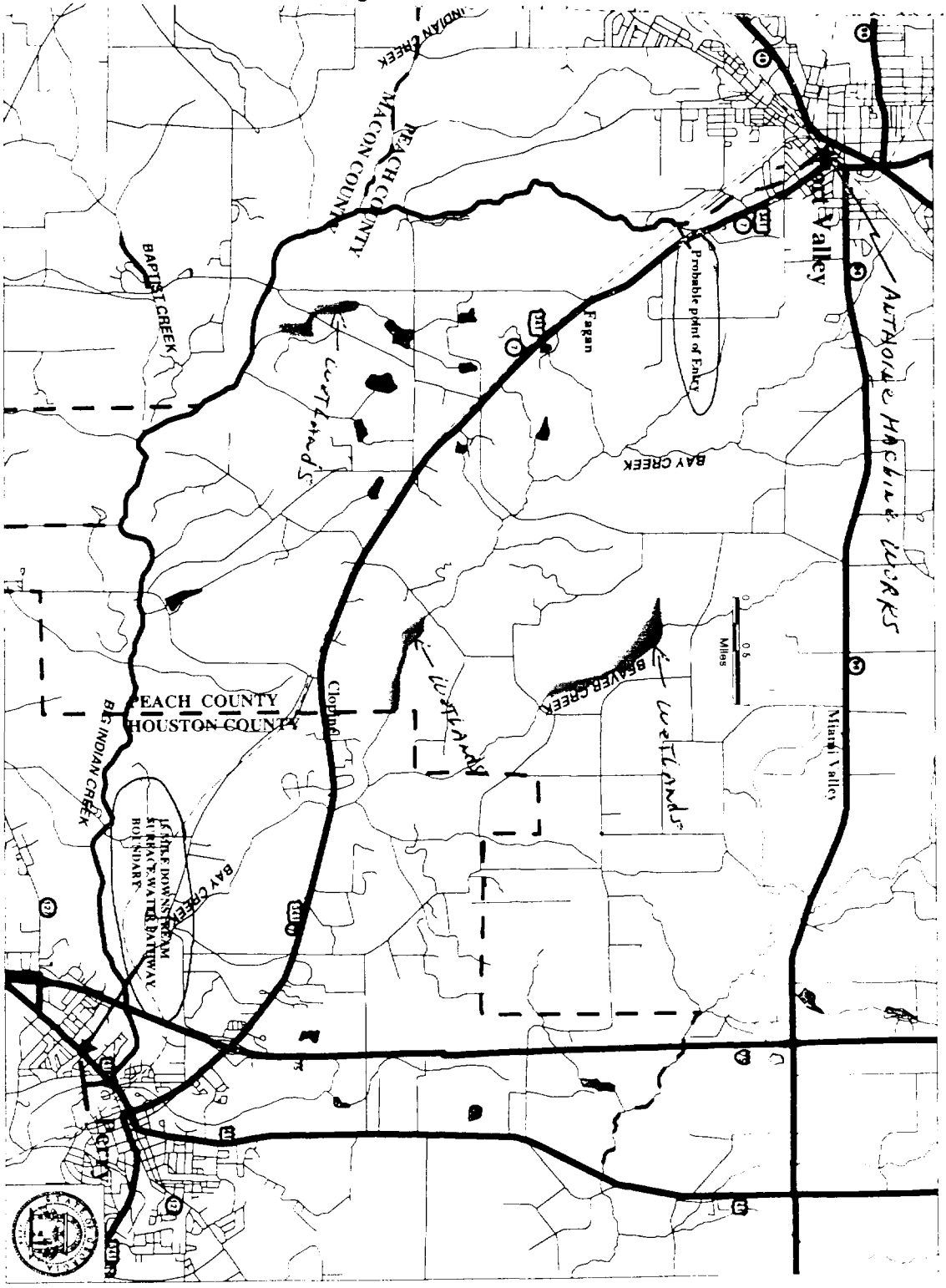
Multiply LR by T and by WC. Divide the product by 82,500 to obtain the ground water pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

**GROUND WATER PATHWAY SCORE:** $\frac{LR \times T \times WC}{82,500}$

0 (Maximum of 100)

# SURFACE WATER PATHWAY

**Sketch of the Surface Water Migration Route:**



## SI TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES (As observed Release)

| Sample ID | Hazardous Substance | Bckgrd. Conc. | Toxicity/ Persistence | Toxicity/ Persis./ Bioaccum | Ecotoxicity/ Persis/ Ecobioaccum | References |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | N/A | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | Highest Values | | | | |

## SI TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# SURFACE WATER PATHWAY
## LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

| LIKELIHOOD OF RELEASE- OVERLAND/FLOOD MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. | | | 6 |
| 2. POTENTIAL TO RELEASE: Distance to surface water: ____(feet) If sampling data do not support a release to surface water in the watershed, use the table below to assign a score from the table below based on distance to surface water and flood frequency. | | | |

| | |
|---|---|
| Distance to surface water <2500 feet | 500 |
| Distance to surface water >2500 feet, and: | |
| Site in annual or 10-yr floodplain | 500 |
| Site in 100-yr floodplain | 400 |
| Site in 500-yr floodplain | 300 |
| Site outside 500-yr floodplain | 100 |

Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2

LR = 100

| LIKELIHOOD OF RELEASE GROUND WATER TO SURFACE WATER MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.<br><br>NOTE: Evaluate ground water to surface water migration only for a surface water body that meets all of the following conditions:<br><br>1) A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0.<br>2) No aquifer discontinuity is established between the source and the above portion of the surface water body.<br>3) The top of the uppermost aquifer is at or above the bottom of the surface water.<br>Elevation of top of uppermost aquifer _____<br>Elevation of bottom of surface water body _____ | N/A | | |
| 2. POTENTIAL TO RELEASE: Use the ground water potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2. | | | |

LR = _____

## SURFACE WATER PATHWAY
### LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET (CONTINUED)

| DRINKING WATER THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type, flow, and number of people served by each drinking water intake within the target distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5.<br><br>Intake Name / Water Body Type / Flow / People Served<br>_____ _____ _____ _____<br>_____ _____ _____ _____<br>_____ _____ _____ _____<br><br>Are any intakes part of a blended system? Yes _____ No _____<br>If yes, attach a page to show apportionment calculations.<br><br>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8).<br><br>_____ , _____<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ **Total =** | 0 | | |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1. | 0 | | |
| 5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0. | 0 | | |
| 6. RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign 0 if none applies.<br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering of commercial livestock<br>• Ingredient in commercial food preparation<br>• Major or designated water recreation area, excluding drinking water use | 0 | | |
| **SUM OF TARGETS T=** | 0 | | |

## SI TABLE 9 (From HRS Table 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY N/A

| Type of Surface Water Body | Pop. | Nearest Intake | Number of people | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,000 | 10,001 to 30,000 | |
| Minimal Stream (<10 cfs) | | 20 | 0 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | |
| Small to moderate stream (10 to 100 cfs) | | 2 | 0 | 0.4 | 2 | 5 | 16 | 52 | 163 | 521 | 1,633 | |
| Moderate to large stream (> 100 to 1,000 cfs) | | 0 | 0 | 0.04 | 0.2 | 0.5 | 2 | 5 | 16 | 52 | 163 | |
| Large Stream to river (>1,000 to 10,000 cfs) | | 0 | 0 | 0.004 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | 5 | 16 | |
| Large River (> 10,000 to 100,000 cfs) | | 0 | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 16 | |
| Very Large River (>100,000 cfs) | | 0 | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Shallow ocean zone or Great Lake (depth < 20 feet) | | 0 | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | |
| Moderate ocean zone or Great Lake (Depth 20 to 200 feet) | | 0 | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Deep ocean zone or Great Lake (depth > 200 feet) | | 0 | 0 | 0 | 0 | 0 | 0.001 | 0.003 | 0.008 | 0.03 | 0.08 | |
| 3-mile mixing zone in quiet flowing river (≥ 10 cfs) | | 10 | 0 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | |

Nearest Intake = [ ]  Sum = [ ]

References _____

Replace w/ HRS Table 4-14

## SURFACE WATER PATHWAY

### Human Food Chain Actual Contamination Targets Summary Table

On SI Table 16, list the hazardous substances detected in sediment, aqueous, sessile benthic organisms tissue, or fish tissue samples (taken from fish caught within the boundaries of the observed release) by sample ID and concentration. Evaluate fisheries within the boundaries of observed releases detected by sediment or aqueous samples as Level II, if at least one observed release substance has a bioaccumulation potential factor value of 500 or greater (see SI Table 7). Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For FDA/AL benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate this portion of the fishery as subject to Level I concentrations. If the percentages are less than 100% or all are N/A, evaluate the fishery as a Level II target.

### Sensitive Environment Actual Contamination Targets Summary Table

On SI Table 11, list each hazardous substance detected in aqueous or sediment samples at or beyond wetlands or a surface water sensitive environment by sample ID. Record the concentration. If contaminated sediments or tissues are detected at or beyond a sensitive environment, evaluate the sensitive environment as Level II. Obtain benchmark concentrations from SCDM. For AWQC/AALAC benchmarks, determine the highest percentage of benchmark of the substances detected in aqueous samples. If benchmark concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage equals or exceeds 100%, evaluate that part of the sensitive environment subject to Level I concentrations. If the percentage is less than 100%, or all are N/A, evaluate the sensitive environment as Level II.

N/A

## SI TABLE 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED (as obtained from release)

Fishery ID: _____ Sample Type _____ Level I _____ Level II _____ References _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Benchmark Concentration (FDAAL) | % of Benchmark | Cancer Risk Concentration. | % of Cancer Risk Concentration | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

## SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

N/A

| Sample ID | Hazardous Substance | Conc.. (µg/L) | Benchmark Concentration (AWQC or AALAC) | % of Benchmark | References |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | Highest Percent | | |

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

| Sample ID | Hazardous Substance | Conc.. (µg/L) | Benchmark Concentration (AWQC or AALAC) | % of Benchmark | References |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | Highest Percent | | |

## SURFACE WATER PATHWAY (continued)
## HUMAN FOOD CHAIN THREAT WORKSHEET

| HUMAN FOOD CHAIN THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page. | | | |

Fishery Name_____ Water Body_____ Flow_____cfs

Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

Fishery Name_____ Water Body_____ Flow_____cfs

Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

Fishery Name_____ Water Body_____ Flow_____cfs

Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

FOOD CHAIN INDIVIDUAL

7. ACTUAL CONTAMINATION FISHERIES: N/A

If analytical evidence indicates that a fishery has been exposed to a hazardous substance with a bioaccumulation factor greater than or equal to 500 (SI Table 10), assign a score of 50 if there is a Level I fishery. Assign 45 if there is a Level II fishery, but no Level I fishery.

8. POTENTIAL CONTAMINATION FISHERIES:

If there is a release of a substance with a bioaccumulation factor greater than or equal to 500 to a watershed containing fisheries within the target distance limit, but there are no Level I or Level II fisheries, assign a score of 20.

If there is no observed release to the watershed, assign a value for potential contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit:

| Lowest Flow | FCI Value |
|---|---|
| <10 cfs | 20 |
| 10 to 100 cfs | 2 |
| >100 cfs, coastal tidal waters, oceans, or Great Lakes | 0 |
| 3-mile mixing zone in quiet flowing river | 10 |

**FCI Value =**

**SUM OF TARGETS T =**

## SURFACE WATER PATHWAY (continued)
## ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

| ENVIRONMENTAL THREAT TARGETS | Score | Data Type | Rels |
|---|---|---|---|
| Record the water body type and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance-limit, assign a score of 0 at the bottom of the page. | | | |

| Environment Name | Water Body Type | Flow |
|---|---|---|
| | | cfs |
| | | cfs |
| | | cfs |
| | | cfs |
| | | cfs |

**9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS:** If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table 11, and assign a factor value for the environment (SI Tables 13 and 14).

| Environment Name | Environment Type and Value (SI Tables 13 & 14) | Multiplier (10 for Level I, 1 for Level II) | Product |
|---|---|---|---|
| | | x = | |
| | | x = | |
| | | x = | |
| | | x = | |
| | | Sum = | |

N/A

**10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:**

| Flow | Dilution Weight (SI Table 12) | Environment Type and Value (SI Tables 13 & 14) | Pot. Cont. | Product |
|---|---|---|---|---|
| cfs | x | x | 0.1 = | |
| cfs | x | x | 0.1 = | |
| cfs | x | x | 0.1 = | |
| cfs | x | x | 0.1 = | |
| cfs | x | x | 0.1 = | |
| | | | Sum = | |

NO SENSITIVE ENVIRONMENTS PRESENT IN SW PATHWAY

T =

## SI TABLE 12 (HRS Table 4-13): SURFACE WATER DILUTION WEIGHTS

| Type of Surface Water Body | | Assigned Dilution Weight |
|---|---|---|
| **Descriptor** | **Flow Characteristics** | |
| Minimal stream | < 10 cfs | 1 |
| Small to moderate stream | 10 to 100 cfs | 0.1 |
| Moderate to large stream | > 100 to 1,000 cfs | 0.01 |
| Large stream to river | > 1,000 to 10,000 cfs | 0.001 |
| Large river | > 10,000 to 100,000 cfs | 0.0001 |
| Very large river | > 100,000 cfs | 0.00001 |
| Coastal tidal waters | Flow not applicable; depth not applicable | ~~0.001~~ 0.0001 |
| Shallow ocean zone or Great Lake | Flow not applicable; depth less than 20 feet | ~~0.001~~ 0.0001 |
| Moderate depth ocean zone or Great Lake | Flow not applicable; depth 20 to 200 feet | ~~0.0001~~ 0.00001 |
| Deep ocean zone or Great Lake | Flow not applicable; depth greater than 200 feet | 0.000005 |
| 3-mile mixing zone in quiet flowing river | 10 cfs or greater | 0.5 |

## SI TABLE 13 (HRS TABLE 4-23): SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

| *SENSITIVE ENVIRONMENT* | *ASSIGNED VALUE* |
|---|---|
| Critical habitat for Federal designated endangered or threatened species<br>Marine Sanctuary<br>National Park<br>Designated Federal Wilderness Area<br>Ecologically important areas identified under the Coastal Zone Wilderness Act<br>Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act<br>Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes)<br>National Monument (air pathway only)<br>National Seashore Recreation Area<br>National Lakeshore Recreation Area | 100 |
| Habitat known to be used by Federal designated or proposed endangered or threatened species<br>National Preserve<br>National or State Wildlife Refuge<br>Unit of Coastal Barrier Resources System<br>Coastal Barrier (undeveloped)<br>Federal land designated for the protection of natural ecosystems<br>Administratively Proposed Federal Wilderness Area<br>Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary<br>Migratory pathways and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time<br>Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding<br>National river reach designated as recreational | 75 |
| Habitat known to be used by State designated endangered or threatened species<br>Habitat known to be used by a species under review as to its Federal endangered or threatened status<br>Coastal Barrier (partially developed)<br>Federally designated Scenic or Wild River | 50 |
| State land designated for wildlife or game management<br>State designated Scenic or Wild River<br>State designated Natural Area<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |
| State designated areas for the protection of maintenance of aquatic life under the Clean Water Act | 5 |
| Wetlands See SI Table 14 (Surface Water Pathway) or SI Table 23 (Air Pathway) | 0 |

## SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

| Total Length of Wetlands | Assigned Value |
|---|---|
| Less than 0.1 mile | 0 |
| 0.1 to 1 mile | 25 |
| Greater than 1 to 2 miles | 50 |
| Greater than 2 to 3 miles | 75 |
| Greater than 3 to 4 miles | 100 |
| Greater than 4 to 8 miles | 150 |
| Greater than 8 to 12 miles | 250 |
| Greater than 12 to 16 miles | 350 |
| Greater than 16 to 20 miles | 450 |
| Greater than 20 miles | 500 |

## SURFACE WATER PATHWAY (concluded)
### WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

**WASTE CHARACTERISTICS** — Score

| | |
|---|---|
| ~~14~~ 11. If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, assign the calculated hazardous waste quantity score, or a score of 100, whichever is greater. | 0 |
| ~~15~~ 12. Assign the highest value from SI Table 7 (observed release) or SI Table 3 (no observed release) for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat. | |

| | Substance Value | HWQ | Product | WC Score (from Table) (Maximum of 100) | |
|---|---|---|---|---|---|
| Drinking Water Threat Toxicity/Persistence | x | = | | | max 100 |
| Food Chain Threat Toxicity/Persistence Bioaccumulation | x | = | | | 1000 |
| Environmental Threat Ecotoxicity/Persistence/ Ecobioaccumulation | x | = | | | 1000 |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 to <1E + 09 | 100 |
| 1E + 09 to <1E + 10 | 180 |
| 1E + 10 to <1E + 11 | 320 |
| 1E + 11 to <1E + 12 | 560 |
| 1E + 12 or greater | 1000 |

**SURFACE WATER PATHWAY THREAT SCORES**

| Threat | Likelihood of Release (LR) Score | Targets (T) Score | Pathway Waste Characteristics (WC) Score (determined above) | Threat Score $\frac{LR \times T \times WC}{82,500}$ |
|---|---|---|---|---|
| Drinking Water | 0 | 0 | max (100) | (maximum of 100) |
| Human Food Chain | 0 | 0 | max 1000 | (maximum of 100) |
| Environmental | 0 | 0 | max 1000 | (maximum of 60) |

**SURFACE WATER PATHWAY SCORE (Drinking Water Threat + Human Food Chain Threat + Environmental Threat)** — (maximum of 100): 0

## SOIL EXPOSURE PATHWAY

If there is no observed contamination (e.g., ground water plume with no known surface source), do not evaluate the soil exposure pathway. Discuss evidence for no soil exposure pathway.

### Soil Exposure Resident Population Targets Summary

For each property (duplicate page 35 as necessary):

If there is an area of observed contamination on the property and within 200 feet of a residence, school, or day care center, enter on Table 15 each hazardous substance by sample ID. Record the detected concentration. Obtain cancer risk, and reference dose concentrations from SCDM. Sum the cancer risk and reference dose percentages for the substances listed. If cancer risk or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the residents and students as Level I. If both percentages are less than 100% or all are N/A, evaluate the targets as Level II.

No Observed Contamination

## SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Residence ID: _____ Level I ____ Level II ____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

N/A

Residence ID: _____ Level I ____ Level II ____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Residence ID: _____ Level I ____ Level II ____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# SOIL EXPOSURE PATHWAY WORKSHEET
# RESIDENT POPULATION THREAT

| LIKELIHOOD OF EXPOSURE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0. | 0 | | 8 |
| LE = | 0 | | |

| TARGETS | | | |
|---|---|---|---|
| 2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on ~~or~~ within 200 feet of areas of observed contamination (HRS section 5.1.3).<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ Sum = | | | |
| 3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (*i.e.*, no Level I or Level II targets), assign 0 (HRS Section 5.1.3). | | | |
| 4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities ~~with~~ areas of observed contamination associated with the site. and within 200' of | | | |

| Number of Workers | Score |
|---|---|
| 0 | 0 |
| 1 to 100 | 5 |
| 101 to 1,000 | 10 |
| >1,000 | 15 |

| | | | |
|---|---|---|---|
| 5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination. | | | |

| Terrestrial Sensitive Environment Type | Value |
|---|---|
| | |
| | |
| | |
| | |
| | |

| | | | |
|---|---|---|---|
| Sum = | | | |
| 6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on an area of observed contamination at the site; assign 0 if none applies.<br>• Commercial agriculture<br>• Commercial silviculture<br>• Commercial livestock production or commercial livestock grazing | | | |
| Total of Targets T= | | | |

## SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

| *TERRESTRIAL SENSITIVE ENVIRONMENT* | *ASSIGNED VALUE* |
|---|---|
| Terrestrial critical habitat for Federal designated endangered or threatened species<br>National Park<br>Designated Federal Wilderness Area<br>National Monument | 100 |
| Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species<br>National Preserve (terrestrial)<br>National or State terrestrial Wildlife Refuge<br>Federal land designated for protection of natural ecosystems<br>Administratively proposed Federal Wilderness Area<br>Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding | 75 |
| Terrestrial habitat used by State designated endangered or threatened species<br>Terrestrial habitat used by species under review for Federal designated endangered or threatened status | 50 |
| State lands designated for wildlife or game management<br>State designated Natural Areas<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |

# SOIL EXPOSURE PATHWAY WORKSHEET
## NEARBY POPULATION THREAT

N/A

| LIKELIHOOD OF EXPOSURE | Score | Data Type | Ref. |
|---|---|---|---|
| 7. Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6) Value _____ | | | |
| Area of Contamination (from SI Table 18 or HRS Table 5-7) Value _____ | | | |
| Likelihood of Exposure (from SI Table 19 or HRS Table 5-8) | | | |
| LE = | | | |

| TARGETS | Score | Data Type | Ref. |
|---|---|---|---|
| 8. Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated. | | | |
| 9. Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (*i.e.*, populations that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS Table 5-10). Sum the population values and multiply by 0.1. | | | |
| T = | | | |

## SI TABLE 17 (HRS TABLE 5-6): ATTRACTIVENESS/ACCESSIBILITY VALUES

| Area of Observed Contamination | Assigned Value |
|---|---|
| Designated recreational area | 100 |
| Regularly used for public recreation (for example, vacant lots in urban area) | 75 |
| Accessible and unique recreational area (for example, vacant lots in urban area) | 75 |
| Moderately accessible (may have some access improvements–for example, gravel road) with some public recreation use | 50 |
| Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use | 25 |
| Accessible with no public recreation use | 10 |
| Surrounded by maintained fence or combination of maintained fence and natural barriers | 5 |
| Physically inaccessible to public, with no evidence of public recreation use | 0 |

## SI TABLE 18 (HRS TABLE 5-7): AREA OF CONTAMINATION FACTOR VALUES

| Total area of the areas of observed contamination (square feet) | Assigned Value |
|---|---|
| ≤ to 5,000 | 5 |
| > 5,000 to 125,000 | 20 |
| > 125,000 to 250,000 | 40 |
| > 250,000 to 375,000 | 60 |
| > 375,000 to 500,000 | 80 |
| > 500,000 | 100 |

## SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

N/A

| AREA OF CONTAMINATION FACTOR VALUE | ATTRACTIVENESS/ACCESSIBILITY FACTOR VALUE | | | | | | |
|---|---|---|---|---|---|---|---|
| | 100 | 75 | 50 | 25 | 10 | 5 | 0 |
| 100 | 500 | 500 | 375 | 250 | 125 | 50 | 0 |
| 80 | 500 | 375 | 250 | 125 | 50 | 25 | 0 |
| 60 | 375 | 250 | 125 | 50 | 25 | 5 | 0 |
| 40 | 250 | 125 | 50 | 25 | 5 | 5 | 0 |
| 20 | 125 | 50 | 25 | 5 | 5 | 5 | 0 |
| 5 | 50 | 25 | 5 | 5 | 5 | 5 | 0 |

## SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

| Travel Distance Category (miles) | Pop. | Number of people within the travel distance category | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,001 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | |
| Greater than 0 to $\frac{1}{4}$ | | 0 | 0.1 | 0.4 | 1.0 | 4 | 13 | 41 | 130 | 408 | 1,303 | 4,081 | 13,034 | |
| Greater than $\frac{1}{4}$ to $\frac{1}{2}$ | | 0 | 0.05 | 0.2 | 0.7 | 2 | 7 | 20 | 65 | 204 | 652 | 2,041 | 6,517 | |
| Greater than $\frac{1}{2}$ to 1 | | 0 | 0.02 | 0.1 | 0.3 | 1 | 3 | 10 | 33 | 102 | 326 | 1,020 | 3,258 | |

Reference(s) _____ Sum =

## SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

**WASTE CHARACTERISTICS**

| | | |
|---|---|---|
| 10. | Assign the hazardous waste quantity score calculated for soil exposure | |
| 11. | Assign the highest toxicity value from SI Table ~~16~~ 15 or 3 | |
| 12. | Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: | WC = |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

**RESIDENT POPULATION THREAT SCORE:**

(Likelihood of Exposure, Question 1;
Targets = Sum of Questions 2, 3, 4, 5, 6)

$$\frac{LE \times T \times WC}{82,500}$$

**NEARBY POPULATION THREAT SCORE:**

(Likelihood of Exposure, Question 7;
Targets = Sum of Questions 8, 9)

$$\frac{LE \times T \times WC}{82,500}$$

**SOIL EXPOSURE PATHWAY SCORE:**
**Resident Population Threat + Nearby Population Threat**

0
(Maximum of 100)

## AIR PATHWAY

### Air Pathway Observed Substances Summary Table

On SI Table 21, list the hazardous substances detected in air samples of a release from the site. Include only those substances with concentrations significantly greater than background levels. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For NAAQS/NESHAPS benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate targets in the distance category from which the sample was taken and any closer distance categories as Level I. If the percentages are less than 100% or all are N/A, evaluate targets in that distance category and any closer distance categories that are not Level I as Level II.

## SI TABLE 21: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Sample ID: N/A Level I ____ Level II ____ Distance from Sources (mi) ____ References ____

| Hazardous Substance | Conc. (µg/m³) | Gaseous Particulate | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Sample ID: ____ Level I ____ Level II ____ Distance from Sources (mi) ____ References ____

| Hazardous Substance | Conc. (µg/m³) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Sample ID: ____ Level I ____ Level II ____ Distance from Sources (mi) ____ References ____

| Hazardous Substance | Conc. (µg/m³) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# AIR PATHWAY WORKSHEET

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to air, assign a score of 550. Record observed release substances on SI Table 21. | | | |
| 2. POTENTIAL TO RELEASE: If sampling data do not support a release to air, assign a score of 500. Optionally, evaluate air migration gaseous and particulate potential to release (HRS Section 6.1.2). | | | |
| LR = | 0 | | |

| TARGETS | | | |
|---|---|---|---|
| 3. ACTUAL CONTAMINATION POPULATION: Determine the number of people within the target distance limit subject to exposure from a release of a hazardous substance to the air.<br>a) Level I: _____ people x 10 = _____<br>b) Level II: _____ people x 1 = _____ Total = | | | |
| 4. POTENTIAL TARGET POPULATION: Determine the number of people within the target distance limit not subject to exposure from a release of a hazardous substance to the air, and assign the total population score from SI Table 22. Sum the values and multiply the sum by 0.1. | | | |
| 5. NEAREST INDIVIDUAL: Assign a score of 50 if there are any Level I targets. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Population exists, assign the Nearest Individual score from SI Table 22. | | | |
| 6. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (SI Table 13) and wetland acreage values (SI Table 23) for environments subject to exposure from the release of a hazardous substance to the air. | N/A | | |
| 7. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release. | | | |
| 8. RESOURCES: Assign a score of 5 if one or more air resources apply within 1/2 mile of a source; assign a 0 if none applies.<br>• Commercial agriculture<br>• Commercial silviculture<br>• Major or designated recreation area | | | |
| T = | | | |

| *Sensitive Environment Type* | *Value* |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

| *Wetland Acreage* | *Value* |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

## SI TABLE 22 (From HRS TABLE 6-17): VALUES FOR POTENTIAL CONTAMINATION AIR TARGET POPULATIONS N/A

| Distance from Site | Pop. | Nearest Individual (choose highest) | Number of People within the Distance Category | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | |
| On a source | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | |
| 0 to $\frac{1}{4}$ mile | | * | 1 | 4 | 13 | 41 | 131 | 408 | 1,304 | 4,081 | 13,034 | 40,812 | 130,340 | 408,114 | |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | | 2 | 0.2 | 0.9 | 3 | 9 | 28 | 88 | 282 | 882 | 2,815 | 8,815 | 28,153 | 88,153 | |
| > $\frac{1}{2}$ to 1 mile | | 1 | 0.06 | 0.3 | 0.9 | 3 | 8 | 26 | 83 | 261 | 834 | 2,612 | 8,342 | 26,119 | |
| > 1 to 2 miles | | 0 | 0.02 | 0.09 | 0.3 | 0.8 | 3 | 8 | 27 | 83 | 266 | 833 | 2,659 | 8,326 | |
| > 2 to 3 miles | | 0 | 0.009 | 0.04 | 0.1 | 0.4 | 1 | 4 | 12 | 38 | 120 | 375 | 1,199 | 3,755 | |
| >3 to 4 miles | | 0 | 0.005 | 0.02 | 0.07 | 0.2 | 0.7 | 2 | 7 | 28 | 73 | 229 | 730 | 2,285 | |
| | **Nearest Individual =** | | | | | | | | | | | | | **Sum =** | |

**References** _____

* Score = 20 if the Nearest Individual is within $\frac{1}{8}$ mile of a source; score = 7 if the Nearest Individual is between $\frac{1}{8}$ and $\frac{1}{4}$ mile of a source.

N/A

## SI TABLE 23 (HRS TABLE 6-18): AIR PATHWAY VALUES FOR WETLAND AREA

| Wetland Area | Assigned Value |
|---|---|
| < 1 acre | 0 |
| 1 to 50 acres | 25 |
| > 50 to 100 acres | 75 |
| > 100 to 150 acres | 125 |
| > 150 to 200 acres | 175 |
| > 200 to 300 acres | 250 |
| > 300 to 400 acres | 350 |
| > 400 to 500 acres | 450 |
| > 500 acres | 500 |

## SI TABLE 24: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS

| Distance | Distance Weight | Sensitive Environment Type and Value (from SI Tables 13 and 20) | Product |
|---|---|---|---|
| On a Source | 0.10 | x | |
| | | x | |
| 0 to 1/4 mile | 0.025 | x | |
| | | x | |
| | | x | |
| 1/4 to 1/2 mile | 0.0054 | x | |
| | | x | |
| | | x | |
| 1/2 to 1 mile | 0.0016 | x | |
| | | x | |
| | | x | |
| 1 to 2 miles | 0.0005 | x | |
| | | x | |
| | | x | |
| 2 to 3 miles | 0.00023 | x | |
| | | x | |
| | | x | |
| 3 to 4 miles | 0.00014 | x | |
| | | x | |
| | | x | |
| > 4 miles | 0 | x | |

**Total Environments Score =** [ ]

## AIR PATHWAY (concluded)

### WASTE CHARACTERISTICS

| | |
|---|---|
| 9. If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculated HWQ score for sources available to air migration. | |
| 10. Assign the highest air toxicity/mobility value from SI Table 21. 83 | |
| 11. Multiply the air pathway toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: | WC = |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

**AIR PATHWAY SCORE:** $\frac{LE \times T \times WC}{82,500}$ 0 (maximum of 100)

| SITE SCORE CALCULATION | S | $S^2$ |
|---|---|---|
| GROUND WATER PATHWAY SCORE ($S_{GW}$) | 0 | |
| SURFACE WATER PATHWAY SCORE ($S_{SW}$) | 0 | |
| SOIL EXPOSURE ($S_S$) | 0 | |
| AIR PATHWAY SCORE ($S_A$) | 0 | |
| SITE SCORE $\sqrt{\frac{S_{GW}^2+S_{SW}^2+S_S^2+S_A^2}{4}}$ = | | 0 |

**COMMENTS**

The purpose of this SI was to determine if any of the Perchloroethelyene found above the MCL in the City of Fort Valley's wells 1 and 2 could be attributed to the machine works site. The most probably pathway would have been the downward movement of contamination through the soil as a result of accidents, spills or improper disposal. The absence of any VOC contamination in the soil above the shallow water table beneath the site indicated that the Perc in the City wells cannot be attributed to the site.

Within 1/2 mile of the site there are at least 5 additional potential past or present sources for the Perc found in these city wells. These sources would be within the radius of influence of these 2 wells so that any Perc that reached the Tuscaloosa aquifer could potentially reach either of these wells.

This SI is part of a larger investigation to determine the source or sources of the Perc in the city wells. This investigation includes additional SIs as well as data from 5 shallow and 5 deep monitoring wells presently being constructed by the Geologic Survey Branch of the Georgia Environmental Protection Division.

## AIR PATHWAY (concluded)

### WASTE CHARACTERISTICS

| | | |
|---|---|---|
| 9. | If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculated HWQ score for sources available to air migration. | |
| 10. | Assign the highest air toxicity/mobility value from SI Table 21. 83 | |
| 11. | Multiply the air pathway toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: | WC = |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

**AIR PATHWAY SCORE:** $\frac{LE \times T \times WC}{82,500}$ 0 (maximum of 100)

| SITE SCORE CALCULATION | S | $S^2$ |
|---|---|---|
| GROUND WATER PATHWAY SCORE ($S_{GW}$) | 0 | |
| SURFACE WATER PATHWAY SCORE ($S_{SW}$) | 0 | |
| SOIL EXPOSURE ($S_S$) | 0 | |
| AIR PATHWAY SCORE ($S_A$) | 0 | |
| SITE SCORE $\sqrt{\frac{S_{GW}^2+S_{SW}^2+S_S^2+S_A^2}{4}}$ = | | 0 |

**COMMENTS**

The purpose of this SI was to determine if any of the Perchloroethelyene found above the MCL in the City of Fort Valley's wells 1 and 2 could be attributed to the machine works site. The most probably pathway would have been the downward movement of contamination through the soil as a result of accidents, spills or improper disposal. The absence of any VOC contamination in the soil above the shallow water table beneath the site indicated that the Perc in the City wells cannot be attributed to the site.

Within 1/2 mile of the site there are at least 5 additional potential past or present sources for the Perc found in these city wells. These sources would be within the radius of influence of these 2 wells so that any Perc that reached the Tuscaloosa aquifer could potentially reach either of these wells.

This SI is part of a larger investigation to determine the source or sources of the Perc in the city wells. This investigation includes additional SIs as well as data from 5 shallow and 5 deep monitoring wells presently being constructed by the Geologic Survey Branch of the Georgia Environmental Protection Division.

DRAFT

# Site Investigation Sampling Plan

## ANTHOINE MACHINE WORKS

GA0001020874

Fort Valley, Georgia

SEPTEMBER 30, 1997

Prepared by:
Robert Pierce, Geologist
Georgia Environmental Protection Division
Hazardous Waste Management Branch

Approved by:
David Yardumian
Unit Coordinator
Hazardous Waste Managemt Branch

DRAFT

# TABLE OF CONTENTS


| Section No. | Section Title | Page No. |
|---|---|---|
| 1.0 | Introduction | 1 |
| 2.0 | Site Description/Location | 1 |
| 3.0 | Operational History & Waste Characteristics | 1 |
| 4.0 | Quality Control Procedures | 1 |
| 5.0 | Investigation Derived Waste Plan | 2 |
| 6.0 | Project Management | 2 |
| 7.0 | Field Equipment/Health & Safety | 2. |
| 8.0 | Project Schedule | 2 |
| 9.0 | Collection of Non-Sampling Data | 2 |
| 10.0 | Sampling Activities | 2 |
| 11.0 | Quality Assurance | 3 |
| 12.0 | Field Activities | 3 |

DRAFT

## 1.0 INTRODUCTION

Under Authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization of 1986 (SARA), and pursuant to grant commitments to the U. S. Environmental Protection Agency (USEPA) Region IV, the State of Georgia Environmental Protection Division (EPD) is conducting a site inspection (SI) at the Anthoine Machine Works site in Fort Valley, Peach County, Georgia. The purpose of the (SI) is to collect information at the Anthoine Machine Works Site sufficient to assess the threat posed to human health and the environment, and to determine the need for additional investigation under CERCLA/SARA or other authority. The scope of the SI includes review of available file information, sampling of waste and environmental media to test preliminary assessment (PA) hypotheses and document hazard ranking system (HRS) factor values and scores, and collecting non-sampling information.

## 2.0 SITE DESCRIPTION/LOCATION

The Anthonine Machine Works Site was identified on the Georgia Wellhead Protection Plan for the City of Fort Valley as a potential source of Tetrachloroethylene (PCE) in City of Fort Valley municipal wells 1 and 2. The plan was prepared by the Georgia Geologic Survey Branch (GSB) of the Georgia Environmental Protection Division and is dated 10/25/96. A separate GSB memo dated 12/11/96 specifically evaluates potential sources of PCE in these municipal wells, and lists the machine works as a potential PCE source. Anthonine Machine Works is located at 311 Railroad St., Fort Valley, Georgia 31030 (Latitude 32°33'04.8"N, Longitude 83°53'09.3"W). The site is in downtown Fort Valley at the intersection of Railroad and Preston Streets. The surrounding land use is industrial. The Central of Georgia Railroad tracks are just across Railroad St. to the NorthWest, and the former Woolfolk Chemical Works bounds the machine works' property to the southeast. The site property is bounded to the northeast by a vacant field, and to the southwest by Preston Street.

## 3.0 OPERATIONAL HISTORY & WASTE CHARACTERISTICS

Anthonine Machine Works has been in Fort Valley Since the late 1800's. The original facility is shown in a 1930 Sanborn Fire Insurance Map at the south east corner of Preston and Railroad Streets approximately 200 feet southwest of its present location. Currently, organic solvents are used to wash parts at a small cleaning station. Spent solvents are currently being removed and replaced by Safety Kleen, Inc.

## 4.0 QUALITY CONTROL PROCEDURES

In order to avoid cross contamination, dedicated scoops, dishes, and coring equipment will be used as much as possible.

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## 5.0 INVESTIGATION-DERIVED WASTE PLAN

Since only soil will be sampled, all soil not collected as a sample will be placed back in the hole from which it was removed.

## 6.0 PROJECT MANAGEMENT

The project manager for the Anthoine Machine Works SI sampling will be Robert Pierce of the Georgia Environmental Protection Division's Hazardous Waste Management Branch. The project manager will also serve as the site safety officer, and will collect and manage all samples. Two (2) soil samples are proposed for this site.

## 7.0 FIELD EQUIPMENT/HEALTH AND SAFETY

Safety monitoring equipment will consist of an Hnu PID which will be used at all sampling locations prior and during sampling. Protective clothing will be Level D, with latex gloves worn during sampling operations. Hard hats, ear protection, and steel toed shoes will be worn at all times around the direct push soil probe.

## 8.0 PROJECT SCHEDULE

The samples will be collected on October 29 1997, and will be taken to the Georgia Environmental Protection Laboratory either late the same day or on the following day. The laboratory turn around time is uncertain but should be about 4 weeks.

## 9.0 COLLECTION OF NON-SAMPLING DATA

Only immediately apparent visual data will be collected.

## 10.0 SAMPLING ACTIVITIES

This site is located in the vicinity of several potential sources of tetrachloroethylene (PCE), and City Wells 1 and 2. These two city wells utilize the Tuscaloosa aquifer and have shown PCE contamination above the MCL. An existing Tuscaloosa monitoring well located on the Anthonine Machine Works Site has shown detectable amounts of PCE. Since we know that PCE ground water contamination exists at depth under the site, we are proposing two (2) soil samples be taken above the shallow water table which is probably 30 feet BLS. The samples will be analyzed for VOCs. If these samples show PCE contamination, it may be reasonable to attribute at least part of the municipal well contamination to downward migration of PCE from the facility. A sample location map is attached.

## 11.0 QUALITY ASSURANCE

One duplicate soil sample will be collected. Sample containers preservatives, and holding times will conform to the USEPA Region IV SOP/QAM dated May 1996.

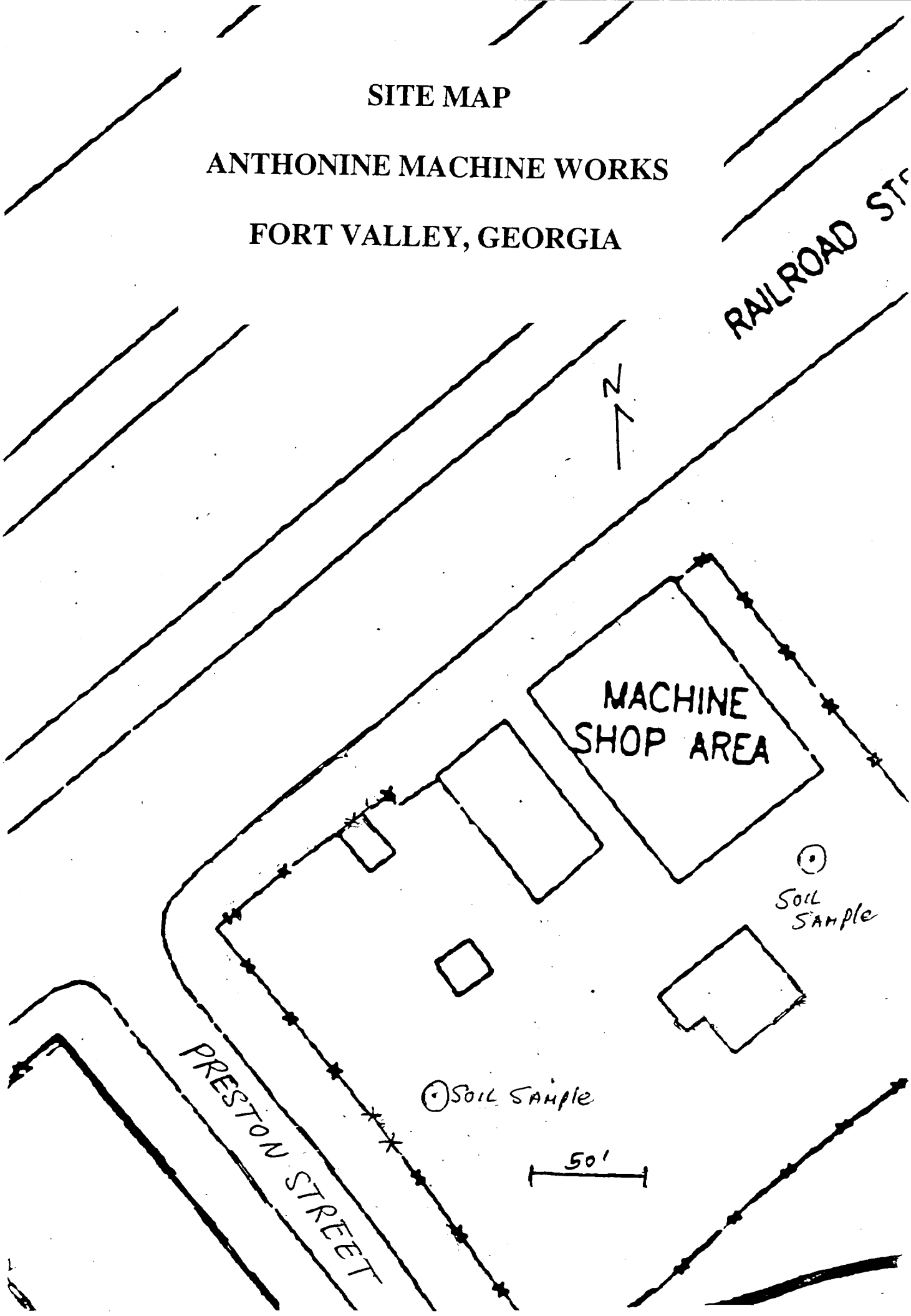
## 12.0 FIELD ACTIVITIES

Samples will be collected on October 29, 1997 using direct push technology. There will be three people involved. Two people will operate the direct push soil probe, and the third person will serve as safety officer as well as collect and manage the samples. Chain of custody protocol will be observed.

# SITE MAP

# ANTHONINE MACHINE WORKS

# FORT VALLEY, GEORGIA



# REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV



**EPA ID:** GA0001974948 **Site Name:** FORMER MAIN STREET DRY CLEANER **State ID:** 34449

**Alias Site Names:**

**City:** FORT VALLEY **County or Parish:** PEACH **State:** GA

**Refer to Report Dated:** 12/01/97 **Report Type:** SITE INSPECTION 001

**Report Developed by:**

**DECISION:**

- [X] **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**
  - [X] **1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)**
  - [ ] **1b. Site may qualify for action, but is deferred to:**
- [ ] **2. Further Assessment Needed Under CERCLA:**
  - **2a. Priority:** [ ] **Higher** [ ] **Lower**
  - **2b. Other: (recommended action)**

**DISCUSSION/RATIONALE:**

Soil and groundwater samples collected during this SI indicate that the former dry cleaners on Main Street is not a threat to human health or the environment. Additional assessment or investigation of this site is not warranted at this time.

**Site Decision Made by:** ALAN W. YARBROUGH

**Signature:** Alan W. Yarbrough **Date:** 08/25/98

**EPA Form # 9100-3**

Reviewed 7/8/98 Alan W. Galbraith

# SITE INSPECTION REPORT

**FORMER DRY CLEANERS ON MAIN STREET**
**FORT VALLEY, PEACH COUNTY, GEORGIA**
**CERCLIS ID No. GA0001974948**

**PREPARED FOR:**

**U.S. ENVIRONMENTAL PROTECTION AGENCY REGION IV**
**ATLANTA FEDERAL BUILDING**
**61 FORSYTH STREET, SW**
**ATLANTA, GEORGIA 30303-3415**

**PREPARED BY:**


**BRENT RABON, ENVIRONMENTAL ENGINEER**
**AND**
**EDDIE WILLIAMS, HYDROGEOLOGIST**
**GEORGIA ENVIRONMENTAL PROTECTION DIVISION**
**205 BUTLER STREET, SE**
**FLOYD TOWER EAST, SUITE 1154**
**ATLANTA, GEORGIA 30334**


**REVIEWED BY:** B.K


**BRUCE KHALEGHI, UNIT COORDINATOR**
**FACILITIES COMPLIANCE PROGRAM**
**GEORGIA ENVIRONMENTAL PROTECTION DIVISION**


**DECEMBER 1997**

TABLE OF CONTENTS


1.0 INTRODUCTION . . . . . 1

2.0 SITE DESCRIPTION . . . . . 1
- 2.1 Location . . . . . 1
- 2.2 Site Description . . . . . 1
- 2.3 Operational History and Waste Characteristics . . . . . 3

3.0 WASTE/SOURCE SAMPLING . . . . . 5
- 3.1 Sample Locations . . . . . 5
- 3.2 Analytical Results . . . . . 5
- 3.3 Conclusions . . . . . 5

4.0 GROUND WATER PATHWAY . . . . . 5
- 4.1 Hydrogeology . . . . . 5
- 4.2 Targets . . . . . 9
- 4.3 Sample Locations . . . . . 11
- 4.4 Analytical Results . . . . . 12
- 4.5 Conclusions . . . . . 12

5.0 SURFACE WATER PATHWAY . . . . . 12
- 5.1 Hydrologic Setting . . . . . 12
- 5.2 Targets . . . . . 12
- 5.3 Sample Locations . . . . . 15
- 5.4 Conclusions . . . . . 15

6.0 SOIL EXPOSURE AND AIR PATHWAY . . . . . 15
- 6.1 Physical Conditions . . . . . 15
- 6.2 Soil and Air Targets . . . . . 16
- 6.3 Soil Sample Locations . . . . . 16
- 6.4 Soil Analytical Results . . . . . 16
- 6.5 Air Monitoring . . . . . 16
- 6.6 Conclusions . . . . . 17

7.0 SUMMARY AND CONCLUSIONS . . . . . 17

8.0 REFERENCES . . . . . 17

## List of Tables

Table 1: Sample Collection . . . . . 6
Table 2: Summary of Soil Sampling Analytical Data . . . . . 7
Table 3: Permitted Groundwater Supply Systems within a 4-mile Radius of the Site . . . . 10
Table 4: Private Wells within a 4-mile Radius of the Site . . . . . 11

## List of Figures

Figure 1: Former Dry Cleaners on Main Street Location on City of Fort Valley Map . . . . 2
Figure 2: Site Sketch . . . . . 4
Figure 3: Sampling Locations . . . . . 8
Figure 4: 15 Mile Surface Water Downstream Pathway . . . . . 13
Figure 5: City of Fort Valley Stormwater Line Map . . . . . 14

## List of Appendices

Appendix A: City of Fort Valley Plates
Plate 1 - Topographic Quadrangle Maps
Plate 2 - Wetlands Quadrangle Maps
Plate 3 - Flood Hazard Rate Map
Appendix B: Site Inspection Worksheets
Appendix C: Chain of Custody Forms and Laboratory Reports for Site Inspection Samples
Appendix D: Frost Associates CENTRACTS Report
Appendix E: Site Inspection Sampling Plan
Appendix F: Superfund Chemical Data Matrix Sheets for Analytes Discovered during Site Inspection
Appendix G: Site Inspection Photographs

## 1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Hazardous Waste Management Branch of the Georgia Environmental Protection Division (GA EPD) conducted a Site Inspection (SI) at the site known as the Former Dry Cleaners on Main Street located in the City of Fort Valley, Peach County, Georgia.

The purpose of this investigation was to collect information concerning conditions at the Former Dry Cleaners on Main Street sufficient to assess the threat posed to human health and the environment and to determine the need for additional investigation under CERCLA or other authority, and, if appropriate, support site evaluation using the Hazard Ranking System (HRS) for proposal to the National Priorities List (NPL). The investigation included reviewing available file information, sampling environmental media to test hypotheses presented in the Summary Preliminary Assessment dated June 3, 1997 (Reference 1), and interviewing nearby residents/business owners in order to evaluate and document a comprehensive target survey.

## 2.0 SITE DESCRIPTION AND HISTORY

### 2.1 Location

The Former Dry Cleaners on Main Street was located in what is now an alley between the McLean Water Plant and Main Street at a location approximately 50 feet northwest of Fort Valley Municipal Supply Well No. 1 in Fort Valley, Georgia. The geographic coordinates are latitude 32°33'10.1" North and longitude 83°53'10.0" West, and the site is located on the Fort Valley East and West, Georgia United States Geologic Survey 7.5 minute Topographic Quadrangle Map, located in Appendix A (Plate 1) (Reference 1).

The regional climate of the site is temperate with an average annual temperature of 65 degrees Fahrenheit (°F). Summers are generally hot and humid with temperature averaging approximately 80 °F during the months of June, July and August. Winters are generally mild with temperatures averaging approximately 50 °F during the months of December, January and February. Annual precipitation at the site averages 44.3 inches, which typically is in the form of rainfall. Historically, the greatest amount of precipitation is experienced in July, with an average rainfall of 5.1 inches. The least amount of precipitation is received in October and November with a combined average rainfall of approximately 2.2 inches (Reference 7).

### 2.2 Site Description

The site is located within an area of mixed land usage which includes small businesses, restaurants, the McLean Water Plant of the Fort Valley Utilities Commission (location of Fort Valley Municipal Supply Well No. 1) and the Woolfolk Chemical Works Industrial Complex (Reference 2; Also See Figure 1). Tetrachloroethylene (PCE) has been detected in the Fort Valley Municipal Water Supply Wells Nos. 1 and 2 at concentration ranges of 1 ug/l to 18 ug/l and 1 ug/l to 16 ug/l, respectively (References 2 and 3), and the Former Dry Cleaners on Main

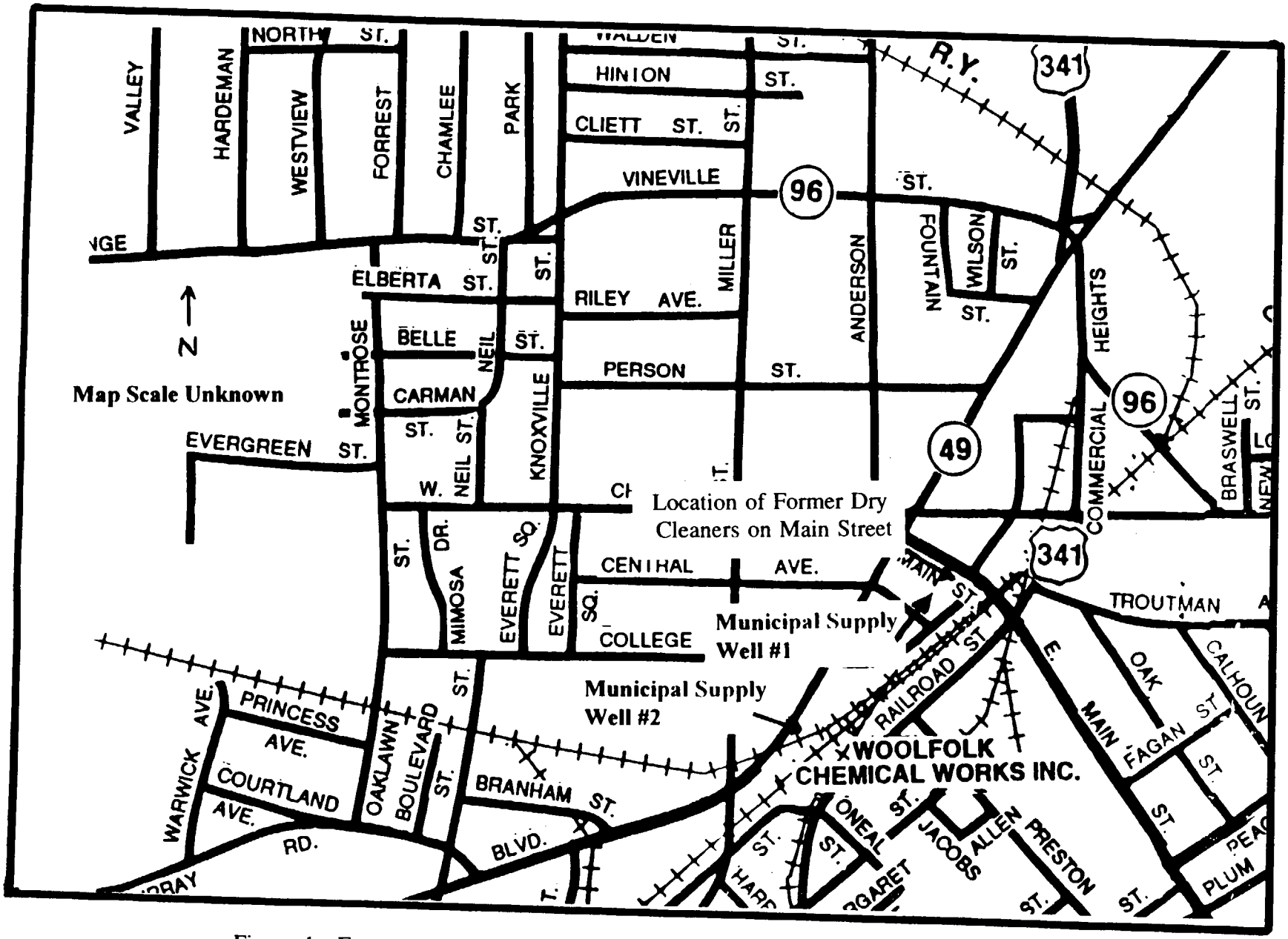



Figure 1: Former Dry Cleaners on Main Street Location on City of Fort Valley Map

Street is located within the wellhead protection area of both Municipal Water Supply Wells (Reference 1; Also See Figure 2). Also see the site photographs located in Appendix G of this Report.

## 2.3 Operational History and Waste Characteristics

Limited history is known of the Former Dry Cleaners on Main Street. According to Mr. Calvin Mason, the owner of this property, a Pressing Club associated with the Winona Hotel (also known as the Harris House) operated until approximately 1934 and was managed by Mr. Miles Johnson. According to Mr. Mason, the Pressing Club routinely dumped excess dry cleaning fluids on the ground and these fluids would drain from the Club along the then-unpaved preferential pathway shown in Figure 2. Mr. Mason also reported that a large number of pigs were killed on a farm in the City of Fort Valley in the early 1930s; these animals reportedly died from drinking contaminated water which drained from the Pressing Club and other businesses in the city at that time. The Winona Hotel was torn down in the early 1970s.

In February 1975, a tornado destroyed the Old Fort Valley Water and Light Building and heavily damaged the City of Fort Valley; Mr. Mason bought the property at 124 Main Street the following month. As part of the cleanup efforts in the aftermath of the tornado, the City of Fort Valley regraded the area behind Mr. Mason's store. During this effort in April 1978, an approximately 500-gallon Underground Storage Tank (UST) was discovered and removed. Mr. Mason stated that the tank contained a couple hundred gallons of liquid that he believed to be dry cleaning fluid and that the liquid and soils around the tank had a very strong kerosene-like odor. Contaminated soils were removed within the UST excavation to a depth of approximately eight (8) feet below the current ground surface (See location of UST No. 1 on Figure 2). Final disposition of the UST and the contaminated soils is unknown (References 1, 2, and 3).

During location of utility lines prior to sampling, Mr. Larry Dailey of the Fort Valley Utilities Commission stated that an additional approximately 500 gallon UST containing kerosene was excavated by the city in April 1978. Mr. Dailey and his staff located the former site of the Kerosene UST in the alley (See location of UST No. 2 on Figure 2), and the SI Work Plan was modified in the field in order to collect soil samples from two (2) discrete depths at this location (Reference 5).

The Former Dry Cleaners on Main Street Site where the approximately 500-gallon believed to be associated with the Winona Hotel Pressing Club was discovered is owned by Mr. Calvin Mason (See UST No. 1 in Figure 2); however, the City of Fort Valley owns the Alley behind 124 Main Street, the McLean Water Plant and the site of the Former Winona Hotel in the southwest quadrant of the site. The City of Fort Valley would, therefore, also own the property where the additional UST containing kerosene was discovered and excavated in April 1978 (See UST No. 2 in Figure 2) (Reference 5).

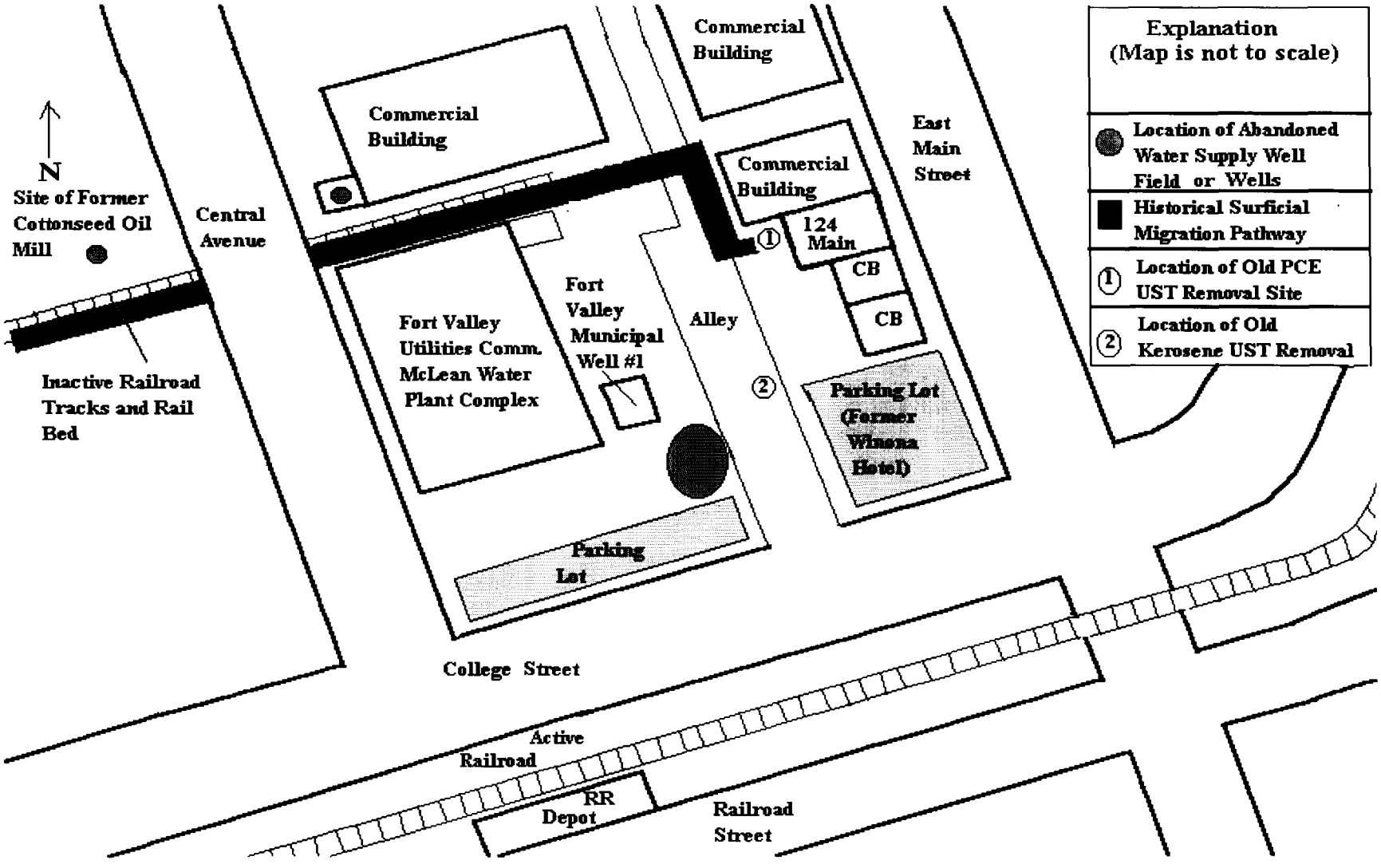



Figure 2. Site Sketch of Former Main Street Laundry (124 Main Street) Area, Fort Valley, Georgia

## 3.0 WASTE/SOURCE SAMPLING

### 3.1 Sample Locations

Two (2) USTs were identified as sources for this SI, and Table 1 presents sample numbers, locations, and other relevant information for all samples collected. Four (4) source soil samples were collected (See Figure 3) as follows:

- Two (2) soil samples (Sample Nos. 2A and 2B) were collected at the former location of the approximately 500-gallon UST attributed to the Winona Hotel Pressing Club;

- Two (2) soil samples (Sample Nos. 1A and 1B) were collected at the former location of the UST identified by the Fort Valley Utilities Commission as containing kerosene;

Soil sampling for this SI was conducted accordance with standard operating procedures specified in the U.S. Environmental Protection Agency (EPA) Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996.

### 3.2 Analytical Results

All soil samples were analyzed for volatile organic compounds (VOCs) utilizing EPA Method No. 8260 and for semivolatile organic compounds (SVOCs) utilizing EPA Method No. 8270A. A summary of soil sampling analytical results is located in Table 2. Toluene was detected in Sample No. 1A at 15.4 µg/kg; no other hazardous substances were detected in the four (4) source soil samples collected at the sources. Chain of Custody forms and Laboratory Reports for the soil samples collected during this SI are in Appendix C of this Report.

### 3.3 Conclusion

There is no evidence of residual hazardous substance contamination in the subsurface soils which remained after two (2) USTs which were excavated at levels which warrant further investigation or assessment. Toluene was detected at 15.4 µg/kg at the former location of the kerosene UST at a depth of eight (8) feet below ground surface. However, no toluene was detected in the deeper soil sample at the same location [i.e., twelve (12) feet below ground surface] and the detection is significantly below the soil exposure pathway benchmark of $7.8 \times 10^6$ µg/kg.

## 4.0 GROUND WATER PATHWAY

### 4.1 Hydrogeology

The City of Fort Valley is located in the Fort Valley Plateau District of the Coastal Plain physiographic province. The dominant feature of the Fort Valley Plateau District is a broad, flat topped topography with fewer streams and less local relief than adjacent districts. The City of Fort Valley is located in an outcrop area of the Lower Paleocene Clayton formation which consists of sandy brick-red clay and fine to coarse grained sand. The Clayton formation is

# TABLE 1: SAMPLE COLLECTION

| Sample Number | Hazardous Waste Management Branch Log Number | Location | Depth (feet below ground surface) | Sample Type | Date | Time |
|---|---|---|---|---|---|---|
| 3A | 7338 | Location No. 3, Hotel | 4 | Subsurface Soil | 10/27/97 | 11:03 am |
| 3B | 7339 | Location No. 3, Hotel | 10 | Subsurface Soil | 10/27/97 | 11:20 am |
| 1A | 7340 | Location No. 1, Kerosene UST | 8 | Subsurface Soil | 10/27/97 | 12:02 pm |
| 1B | 7341 | Location No. 1, Kerosene UST | 12 | Subsurface Soil | 10/27/97 | 12:17 pm |
| 4A | 7342 | Location No. 4, Alley | 4 | Subsurface Soil | 10/27/97 | 4:25 pm |
| 4B | 7343 | Location No. 4, Alley | 8 | Subsurface Soil | 10/27/97 | 4:40 pm |
| 5A | 7344 | Location No. 5, Railroad Bed | 5 | Subsurface Soil | 10/27/97 | 5:12 pm |
| 2A | 7345 | Location No. 2, Winona Hotel Pressing Club UST | 9 | Subsurface Soil | 10/28/97 | 9:15 am |
| 2B | 7346 | Location No. 2, Winona Hotel Pressing Club UST | 12 | Subsurface Soil | 10/28/97 | 9:32 am |
| 6A | 7347 | Location No. 6, Railroad Bed | 3 | Subsurface Soil | 10/28/97 | 10:50 am |
| 6B | 7348 | Location No. 6, Railroad Bed | 8 | Subsurface Soil | 10/28/97 | 11:02 am |
| 1C | 7349 | Shallow Well | 29.33[1] | Groundwater | 10/28/97 | 12:08 pm |
| N/A | 7350 | Field Trip Blank | N/A | N/A | 10/22/97 | N/A |

[1]Depth of groundwater measured from top of casing.

R:\BRENTR\SNFTVALL\TABLE1

# TABLE 2: SUMMARY OF SOIL SAMPLING ANALYTICAL RESULTS

| Analyte (µg/kg) | Sample Number/Hazardous Waste Management Branch Log Number | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3A/ 7338 | 3B/ 7339 | 1A/ 7340 | 1B/ 7341 | 4A/ 7342 | 4B/ 7343 | 5A/ 7344 | 2A/ 7345 | 2B/ 7346 | 6A/ 7347 | 6B/ 7348 |
| Acetone | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | **141** |
| Toluene | **6.2** | ND | **15.4** | ND | **6.19** | ND | **7.93** | ND | ND | ND | ND |
| Benzo[a]anthracene | ND | ND | ND | ND | ND | ND | **1665** | ND | ND | ND | ND |
| Benzo[a]pyrene | ND | ND | ND | ND | ND | ND | **2063** | ND | ND | ND | ND |
| Benzo[b]fluoranthene | ND | ND | ND | ND | ND | ND | **2653** | ND | ND | ND | ND |
| Benzo[g,h,i]perylene | ND | ND | ND | ND | ND | ND | **1772** | ND | ND | ND | ND |
| Benzo[k]fluoranthene | ND | ND | ND | ND | ND | ND | **1944** | ND | ND | ND | ND |
| Chrysene | ND | ND | ND | ND | ND | ND | **3404** | ND | ND | ND | ND |
| Fluoranthene | ND | ND | ND | ND | ND | ND | **6176** | ND | ND | ND | ND |
| Indeno[1,2,3-cd]pyrene | ND | ND | ND | ND | ND | ND | **1943** | ND | ND | ND | ND |
| Phenanthrene | ND | ND | ND | ND | ND | ND | **6108** | ND | ND | ND | ND |
| Pyrene | ND | ND | ND | ND | ND | ND | **6880** | ND | ND | ND | ND |

ND = Not detected

R:\BRENTR\SNFTVALL\TABLE2

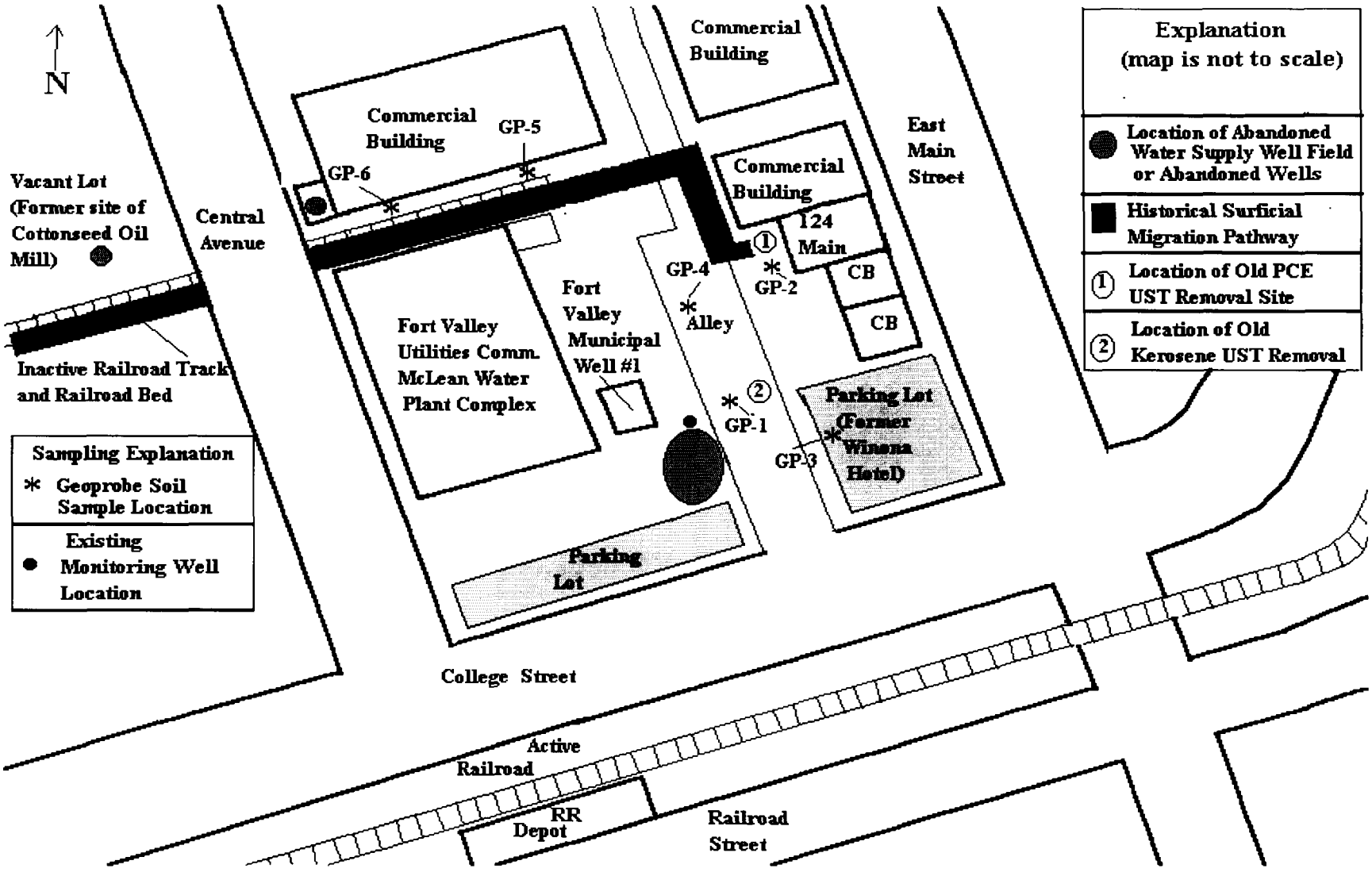



Figure 3. Sample Locations for Former Main Street Laundry (124 Main Street), Fort Valley, GA.

underlain by the Providence Sand, Providence-Ripley-Cusetta, Blufftown-Eutaw, and Tuscaloosa formations.

The shallow most aquifer is the Clayton (or perched) aquifer which is composed 10-35 feet of silty fine sand. The Clayton aquifer is overlain by 10-15 feet of soil and a sandy clay unit, and underlain by an aerially extensive kaolin layer which ranges in thickness from 2-20 feet. Groundwater in the Clayton aquifer is under water table conditions, and depth to ground water in this aquifer is approximately 25-30 feet below land surface. The deepest aquifer in Fort Valley is the Tuscaloosa aquifer which occurs at a depth of about 250 feet below land surface. This aquifer is overlain by the Ripley/Blufftown - Eutaw semiconfining unit and groundwater in the Tuscaloosa aquifer occurs under confined conditions. The Tuscaloosa aquifer is the primary source of ground water to the high capacity wells in the area including Fort Valley City Municipal Water Supply Well Nos. 1, 2 and 5 (References 8 and 9).

## 4.2 Targets

The City of Fort Valley Supply System extracts groundwater from five (5) municipal supply wells which supply a total of 10,000 residents with drinking water (Reference 10, Also see Table 3). Fort Valley Municipal Water Supply Well Nos. 1, 2 and 5 are located within the 1/4 mile radius and are serviced by the McLean Water Treatment Plant, and Municipal Water Supply Well Nos. 3 and 4 are located within the 1-2 mile radius and are serviced by the Jones Alley Water Plant. The contact person/address for these five (5) wells is as follows.

City of Fort Valley
Fort Valley Utilities Commission
ATTN: Mr. Glen Taylor
P.O. Box 1529
Fort Valley, GA 31030

The Rolling Hills Mobile Home Park Supply System extracts groundwater from two (2) wells located at approximately the 3-mile radius (included in the 2-3 mile radius) and supplies groundwater to approximately 65 residents (Reference 10, Also see Table 3). The contact person/address for these two (2) wells is as follows.

Rolling Hills Mobile Home Park
ATTN: Mr. James Ross
Route 4, Box 4380, Sunset Drive
Fort Valley, GA 31064

Well depths for these seven (7) wells are in excess of 400 feet with production intervals below 200 feet below land surface. Yields range from 560 gallons per minute (gpm) to 1,397 gpm. Drawdowns for the wells average approximately 23 feet. Note that the seven (7) groundwater extraction wells comprising the two (2) systems above are listed in Table 3 (Reference 10).

Residential groundwater users are also composed of residents who cannot access the City of Fort Valley and Rolling Hills Mobile Home Park Groundwater Supply Systems and/or residents who

## Table 3: Permitted Groundwater Supply Systems within a 4-mile Radius of the Former Dry Cleaners on Main Street

| COUNTY | WATER SYSTEM ID NUMBER | SYSTEM NAME | SOURCE NAME | PURCHASED IDENTIFICATION TYPE/STATUS | LATITUDE (NORTH) | LONGITUDE (WEST) |
|---|---|---|---|---|---|---|
| Peach | 2250001 | Fort Valley | McLean Water Supply Well No. 1 | Groundwater/ Permanent | 32°33'43" | 83°35'26" |
| Peach | 2250001 | Fort Valley | McLean Water Supply Well No. 2 | Groundwater/ Permanent | 32°32'45" | 83°53'14" |
| Peach | 2250001 | Fort Valley | McLean Water Supply Well No. 3 | Groundwater/ Permanent | NA | NA |
| Peach | 2250001 | Fort Valley | Jones Well No. 1 | Groundwater/ Permanent | 32°31'59" | 83°53'43" |
| Peach | 2250001 | Fort Valley | Jones Well No. 2 | Groundwater/ Permanent | 32°31'59" | 83°53'43" |
| Peach | 2250005 | Rolling Hills Mobile Home Park | Drilled Well No. 1 | Groundwater/ Permanent | 32°32'53" | 83°56'04" |
| Peach | 2250005 | Rolling Hills Mobile Home Park | Drilled Well No. 2 | Groundwater/ Permanent | 32°32'53" | 83°56'04" |

NA = Information Not Available

R:\BRENTR\SI\FTVALL\TABLE3

have opted to keep their own wells. Private well data per radius are compiled in the following table (Reference 11, See Appendix D for the entire Frost Associates CENTRACTS Report).

**TABLE 4: Private Residential Wells Within a 4-Mile Radius of the Former Dry Cleaners on Main Street Site**

| | 0-1/4 mile | 1/4-1/2 mile | 1/2-1 mile | 1-2 miles | 2-3 miles | 3-4 miles |
|---|---|---|---|---|---|---|
| **Drilled Wells** | .76 | 2.87 | 11.90 | 60.54 | 108.27 | 127.52 |
| **Dug Wells** | .14 | .28 | 2.46 | 15.25 | 25.46 | 22.94 |
| **Total Wells** | .90 | 3.15 | 14.36 | 75.79 | 133.73 | 150.46 |
| **Population on Wells** | 2.97 | 9.90 | 37.24 | 229.34 | 397.03 | 442.08 |

In addition, irrigation for peach and pecan orchards constitutes significant groundwater usage within the Fort Valley area. Currently there are active irrigation permits for four (4) systems in the 1-2 mile radius, three (3) systems in the 2-3 mile radius, and eleven (11) systems in the 3-4 mile radius. Most of these wells are capable of producing in excess of 1,000 gpm each and may also be used for the watering of livestock (Reference 21).

The Former Dry Cleaners on Main Street is located within the wellhead protection area of both Fort Valley Municipal Water Supply Well Nos. 1 and 2 (Reference 1).

### 4.3 Sample Locations

One (1) groundwater sample (Sample No. 1C) was collected from the shallow monitoring well, approximately 25 feet deep, located between the Fort Valley Municipal Supply Well No. 1 and the Site (See Figure 3). The SI Work Plan dated September 1997 (See Appendix E) proposed collection of groundwater samples using the geoprobe at up to six locations. GA EPD attempted to collect groundwater samples at Sample Location Nos. 1 and 2 (See Figure 3) at a depth between thirty-four (34) and thirty-eight (38) feet below ground surface (i.e., within the surficial groundwater aquifer); however, both sampling attempts resulted in no groundwater collected primarily due to low recharge attributable to the kaolinitic clay below the Site at these depths. Given the inability to collect groundwater samples at these two locations, no additional attempts were made to collect groundwater samples from Sample Location Nos. 3-6 (See Figure 3).

Groundwater sampling for this SI was conducted accordance with standard operating procedures specified in the U.S. Environmental Protection Agency (EPA) Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated

May 1996.

### 4.4 Analytical Results

The groundwater samples were analyzed for volatile organic compounds (VOCs) utilizing EPA Method No. 8260. There were no detections of hazardous substances detected in the field trip blank or in the one (1) groundwater sample (Sample No. 1C) which was collected from the shallow monitoring well, approximately 25 feet deep, located between the Fort Valley Municipal Supply Well No. 1 and the Site. The Chain of Custody form and Laboratory Report for the groundwater sample collected during this SI are in Appendix C of this Report.

### 4.5 Conclusions

There was no detection of a hazardous substance in the groundwater sample collected, and there is no evidence that groundwater in the downtown area of Fort Valley is contaminated from activities associated with the Former Dry Cleaners on Main Street. The groundwater pathway is not of concern.

## 5.0 SURFACE WATER PATHWAY

### 5.1 Hydrologic Setting

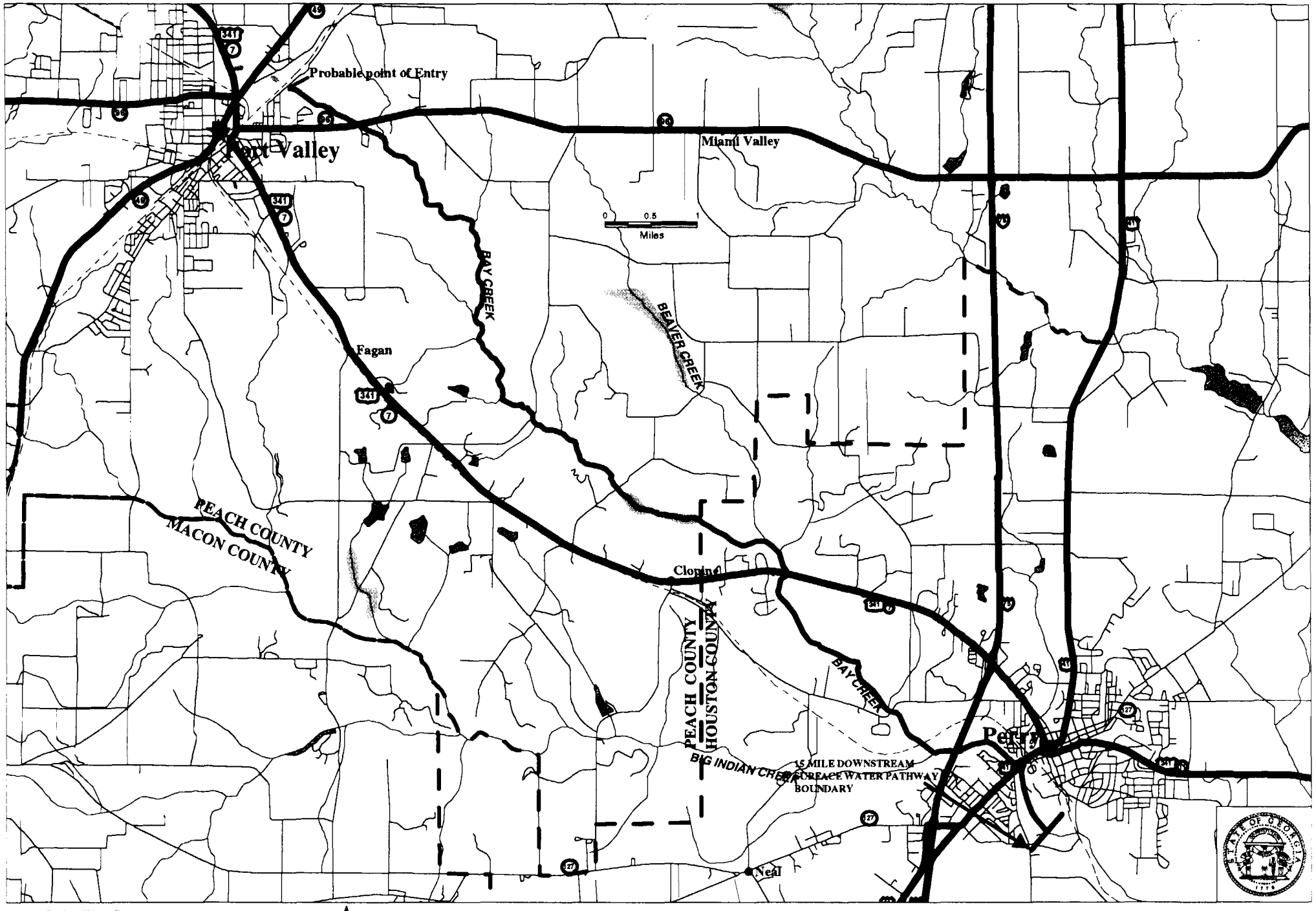
The Former Dry Cleaners on Main Street is located on a topographic plateau (Reference 12; Also See Plate 1 in Appendix A). Prior to development of the downtown district, surface water from the site flowed down the alley towards the railroad spur and then continuing south down the railroad grade (See Figure 4). Following development of the downtown district, sewers and storm drains were installed to handle the city's sewage and stormwater runoff.

In the area of the site, a stormwater line carries wastewaters northwest up the alley to Camellia Boulevard (also known as Macon Street) (Figure 5, Reference 20). The stormwater line goes 1.4 miles northeast underneath the City of Fort Valley and then discharges to Bay Creek, the surface water pathway probable point of entry (PPE). Runoff is then carried 11.9 miles down Bay Creek to its convergence with Big Indian Creek which flows through Perry, Georgia. Big Indian Creek is a moderate size stream with an average flow rate of 86 cubic feet per second and an average low flow rate of 21 cubic feet per second (Reference 13). The 15-mile limit is reached just south of Perry, Georgia.

There has been no Flood Insurance Administration Map produced for the Fort Valley area. However, a Flood Hazard Rate Map has been produced for the area. The Flood Hazard Rate Map located in Appendix A (Plate 3) shows the site to be outside the 500-year floodplain (Reference 14).

### 5.2 Surface Water Targets

There are no drinking water intakes within 15 downstream miles (Figure 4). It is likely some




Surface Water Pathway
Hydrology
County Boundary
Projected Surface Pathway
Major Highway
Major Wetland

Site Location
City/Town
Unincorporated Town

FORMER DRY CLEANERS - FORT VALLEY, PEACH COUNTY

**Figure 4: 15 Mile Surface Water Downstream Pathway**

Source: 1990 Census Bureau (TIGER), US EPA (GIRAS Landuse), GA DOT (Wetlands)

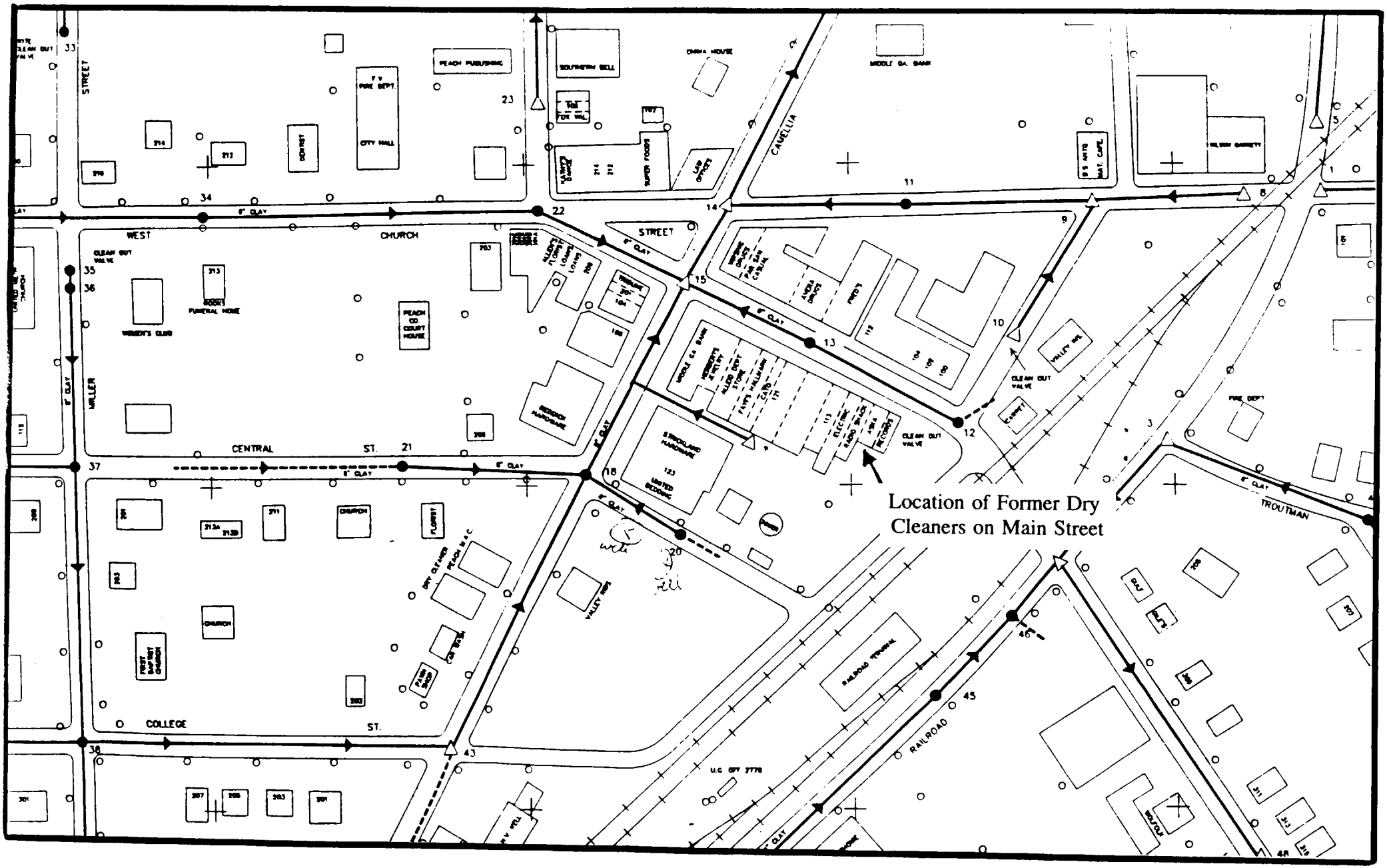



Figure 5: City of Fort Valley Stormwater Line Map

recreational fishing (brim and bass) occurs in the area where Bay Creek merges into Big Indian Creek. There is limited access to this area by the public; therefore, only the people whom own properties along the creeks have the opportunity to catch fish (Reference 19). The distance between the former dry-cleaning business and the potential fishery is approximately 13.3 miles. There are 8 miles of stream frontage wetlands located within 15 downstream miles of the site. The nearest wetland (approximately 50 acres, 0.5 mile frontage) is approximately 2.0 miles downstream from the site on Bay Creek (Reference 16; Also See Plate 2 in Appendix A)

Pursuant to the Georgia Endangered Wildlife Act of 1973 and the Federal Endangered Species Act of 1973, no wildlife is designated as a state and federally protected species (classified as endangered wildlife) whose range of habitats includes Peach and Houston Counties (Reference 17).

Pursuant to the Georgia Wildlife Preservation Act of 1973, Chamaecyparis thyoides (Linnaeus) Atlantic White Cedar, Nestronia umbellula (Rafinesque) Indian Olive, Sarracenia rubra (Walter) Sweet Pitcherplant and Trillium reliquum (Freeman) Relict Toadshade are designated as state protected species (classified threatened/endangered plants) whose range of habitat include Peach, Houston, Taylor, Talbot, Marion, Crawford, Muscogee, Macon and Schley Counties (Reference 18). The protected flora and fauna identified in the preceding sentence were not designated as terrestrial sensitive environments for the soil or air pathways due to the fact that none of the protected species were observed on-site or off-site during the reconnaissance.

### 5.3 Surface Water Sample Locations

No surface water samples were taken to identify a release to Bay Creek and Big Indian Creek. Probable point of entry (PPE) were chosen for Bay Creek and Big Indian Creek based on the surface runoff, topography of the area and the stormwater line discharge.

### 5.4 Surface Water Conclusions

A potential release of contaminants to surface water is not suspected because of the distance to the PPE. No drinking water intakes have been identified but sensitive environments (i.e., wetlands and fishery) have been identified. The surface water pathway is not of concern.

## 6.0 SOIL EXPOSURE AND AIR PATHWAY

### 6.1 Physical Conditions

The Site is located within an area of mixed land usage which includes small businesses, restaurants, the McLean Water Plant of the Fort Valley Utilities Commission (location of Fort Valley Municipal Supply Well No. 1) and the Woolfolk Chemical Works Industrial Complex (Reference 2; Also See Figure 1). The USTs identified as the source units for this SI and which reportedly contained dry cleaning fluids and kerosene are located in an alley southwest of 124 Main Street in Fort Valley (See Figure 2). They alley is now paved with asphalt (Reference 2).

## 6.2 Soil and Air Targets

The Former Dry Cleaners on Main Street in no longer operational, and the two (2) USTs identified as source units have been excavated (References 1, 2, 3 and 5). There are approximately ten (10) households within a quarter mile of the site, and the total population within four miles of the site is 9617 (Reference 11).

## 6.3 Soil Sample Locations

Two (2) USTs were identified as sources for this SI, and an additional four sampling locations were selected based upon the locations of these source units in order to address the soil exposure pathway (See Figure 3). Table 1 presents sample numbers, locations, and other relevant information for all samples collected. Seven (7) soil exposure pathway samples were collected as follows:

- Seven (7) soil samples (Sample Nos. 3A, 3B, 4A, 4B, 5A, 6A and 6B) were collected along the historical surficial migration pathway identified in Figure 3; and

Soil sampling for this SI was conducted accordance with standard operating procedures specified in the U.S. Environmental Protection Agency (EPA) Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996.

## 6.4 Soil Analytical Results

All soil samples were analyzed for volatile organic compounds (VOCs) utilizing EPA Method No. 8260 and for semivolatile organic compounds (SVOCs) utilizing EPA Method No. 8270A. A summary of soil sampling analytical results is located in Table 2. Toluene was detected in Sample Nos. 3A, 4A, and 5A at 6.2 µg/kg, 6.19 µg/kg, 7.93 µg/kg, respectively. Acetone was detected in Sample No. 6B at 141 µg/kg.

In addition, a number of Polynuclear Aromatic Hydrocarbons (PAHs) were discovered in Sample No. 5A (See Table 2). This sample was collected in the railroad bed at a depth of five (5) feet below ground surface. When the geoprobe sampling device was opened in the field, a segment of the sample core contained what appeared to be a wooden railroad tie (Reference 22). Note (1) that the soil was removed from the sampling device and sent to the laboratory as Sample No. 5A and (2) that a deeper sample was not collected at this location due to geoprobe refusal.

Chain of Custody forms and Laboratory Reports for the soil samples collected during this SI are in Appendix C of this Report.

## 6.5 Air Monitoring

In accordance with Section 5.1 of the SI Work Plan dated September 1997 (See Appendix E), a portable air quality monitor (i.e., an HNu meter) was carried onsite during the SI. No measurements above background were detected. No formal air monitoring program was conducted.

## 6.6 Conclusions

The Polynuclear Aromatic Hydrocarbons (PAHs) discovered in Sample No. 5A are attributable to the wooden railroad tie which was encountered during the sample collection event and are not attributable to activities associated with the Former Dry Cleaners on Main Street. Toluene detected in Sample Nos. 3A, 4A, and 5A and Acetone detected in Sample No. 6B are significantly below their soil exposure pathway benchmarks of $1.6 \times 10^7$ µg/kg and $7.8 \times 10^6$ µg/kg, respectively. There was no indication of a release to the air pathway. The soil and air exposure pathways are not of concern.

# 7.0 SUMMARY AND CONCLUSIONS

The purpose of this SI was to collect information concerning conditions at the Former Dry Cleaners on Main Street sufficient to assess the threat posed to human health and the environment and to determine the need for additional investigation under CERCLA or other authority, and, if appropriate, support site evaluation using the Hazard Ranking System (HRS) for proposal to the National Priorities List (NPL). In addition, information was collected to confirm target populations and environmental potentially at risk from the site.

Limited history is known of the Former Dry Cleaners on Main Street. During excavation in the alley behind 124 Main Street in Fort Valley in April 1978, two (2) USTs were discovered and removed (References 1, 2, 3 and 5). One of the tanks is attributed to operations of a Former Dry Cleaners on Main Street which is no longer operational. Both USTs identified as source units have been excavated (References 1, 2, 3 and 5), and the exposure pathways to receptors for groundwater, surface water, soil and air are not of concern.

Soil and groundwater samples collected during this SI indicate that the Former Dry Cleaners on Main Street is not a threat to human health or the environmental. Additional assessment or investigation of the Former Dry Cleaners on Main Street in Fort Valley, Georgia is not warranted.

# 8.0 REFERENCES


1. GA EPD Correspondence (Ussery to McKeown) dated June 3, 1997; Summary Preliminary Assessment, Former Dry Cleaner - Main Street (Name Unknown), Peach County, Georgia.

2. GA EPD Site Visit to Fort Valley by Bob Pierce, Brent Rabon, Steve White and Eddie Williams; August 19, 1997.

3. GA EPD Site Visit to Fort Valley and Interview with Mr. Calvin Mason by Brent Rabon; September 11, 1997.

4. GA EPD Telephonic Conversation (Eddie Williams) with Mr. Gary Dye, Fort Valley

Utilities Commission, September 24, 1997.

5. GA EPD Site Visit to Fort Valley and Interview with Mr. Larry Dailey, Fort Valley Utilities Commission, by Brent Rabon and Eddie Williams; October 20, 1997.

6. GA EPD Georgia Geologic Survey Fort Valley Phase I Investigation Plan, September 12, 1997.

7. Final Corrective Action Plan for Duck Lake dated February 1997, as amended; Robins Air Force Base.

8. Draft Remedial Investigation Report, Woolfolk Chemical Works Site-Fort Valley, Georgia, CH2M Hill, July 1992

9. Work Plan for Investigating the Relation Between PCE Found in Fort Valley Water Supply Wells and the Woolfolk Chemical Works Superfund Site, March 17, 1997.

10. Georgia Department of Natural Resources, Environmental Protection Division, Drinking Water Protection Branch Web Page; information accessed in December 1997 by Eddie Williams.

11. Bob Frost, Owner, Frost Associates, 88 Founders Village, Clinton, CT 06426, CENTRACTS report Identifying Population, Households and Private Water Wells Within 4, 3, 2, 1, 1/2 and /14 Miles of latitude 32°33'10.1" North and longitude 83°53'10.0" West.

12. U.S. Department of the Interior, Geologic Survey, Georgia United States Geologic Survey 7.5 minute Topographic Quadrangle Maps, Fort Valley East and West; Scale: 1:24,000.

13. GA EPD Telephonic Conversation (Jim Sliwinski) with Mr. Roger McFarlene, U.S. Geologic Survey, December 11, 1997.

14. U.S. Department of Housing and Urban Development, Flood Hazard Rate Map of Peach County, Georgia, 25 June 1976.

15. GA EPD Telephonic Conversation (Jim Sliwinski) with Mr. Walter Lanter, City of Fort Valley Utility, December 10, 1997.

16. U.S. Department of the Interior, Fish and Wildlife Service, National Inventory Maps of Georgia, Fort Valley West 1995; Fort Valley East 1995; Marshallville 1988; Perry West 1988; and Perry East 1988; Scale: 1:24,000.

17. Odom, Ron R., Georgia's Protected Wildlife, Georgia Department of Natural Resources, Game and Fish Division, Endangered Wildlife Program, 15 September 1977.

18. Patrick, Thomas S., Protected Plants of Georgia, Georgia Department of Natural Resources, Wildlife Resources Division, Georgia Natural Heritage Program, 1995.

19. GA EPD Telephonic Conversation (Jim Sliwinski) with Mr. Steve Schleger, Georgia Department of Natural Resources, Wildlife Resources Division, Fort Valley, December 12, 1997.

20. GA EPD Telephonic Conversation (Jim Sliwinski) with Mr. Robert Little, City of Fort Valley City Hall, December 15, 1997.

21. File Review by Eddie Williams, GA EPD Water Resources Management Branch, December 1997.

22. Former Dry Cleaners on Main Street Site Inspection field sampling event conducted by Brent Rabon, Steve White, Eddie Williams, and Thomas Williams; 27 and 28 October 97.

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# Appendix A: City of Fort Valley Plates

Plate 1 - Topographic Quadrangle Maps
Plate 2 - Wetlands Quadrangle Maps
Plate 3 - Flood Hazard Rate Map

# OVERSIZED

# DOCUMENT

# Appendix B: Site Inspection Worksheets

# SITE INSPECTION WORKSHEETS

| CERCLIS IDENTIFICATION NUMBER | |
|---|---|
| GA 0001974948 | |

## SITE LOCATION

**SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE**
Former Dry Cleaner on Main Street

**STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFIER**
Property behind 124 Main Street where the potential Kerosene Underground Storage Tank (i.e., Source Unit Number 2) was discovered. Note that the City of Fort Valley owns the Alley behind 124 Main Street, McLean Water Plant and site of Former Winona Hotel in the southwest quadrant of the Site.

| COORDINATES: LATITUDE AND LONGITUDE | STATE | ZIP CODE | TELEPHONE |
|---|---|---|---|
| Latitude 32°33'10.1" North and Longitude 83°53'10.0" West | GA | 31030 | (912)825-7701 |

## OWNER/OPERATOR IDENTIFICATION

| OWNER | OPERATOR |
|---|---|
| City of Fort Valley<br>ATTN: John W. Ezell, Jr. Mayor | City of Fort Valley<br>Utilities Commission<br>ATTN: Motea P. Jackson, Chairman |
| **OWNER ADDRESS** P.O. Box 956 | **OPERATOR ADDRESS** P.O. Box 1529 |
| **CITY** Fort Valley | **CITY** Fort Valley |

| STATE | ZIP CODE | TELEPHONE | STATE | ZIP CODE | TELEPHONE |
|---|---|---|---|---|---|
| GA | 31030 | (912)825-8261 | GA | 31030 | (912)825-7701 |

## SITE EVALUATION

| | | |
|---|---|---|
| **AGENCY/ORGANIZATION**<br>Georgia Department of Natural Resources | Georgia Environmental Protection Division | |
| **INVESTIGATOR**<br>Brent Rabon | Environmental Engineer | |
| **CONTACT**<br>Steve White | Environmental Specialist | |
| **ADDRESS**<br>205 Butler Street, SE<br>Floyd Towers East, Suite 1162 East | | |
| **CITY**<br>Atlanta | **STATE**<br>Georgia | **ZIP CODE**<br>30334 |
| **TELEPHONE**<br>(404)656-2833 | | |

| CERCLIS IDENTIFICATION NUMBER | |
|---|---|
| GA 0001974948 | |

## SITE LOCATION

**SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE**
Former Dry Cleaner on Main Street

**STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFIER**
Property at 124 Main Street up to Alley where the potential Dry Cleaners Underground Storage Tank (i.e., Source Unit Number 1) was discovered. Note that the City of Fort Valley owns the Alley, McLean Water Plant and site of Former Winona Hotel in the southwest quadrant of the Site.

| COORDINATES: LATITUDE AND LONGITUDE | STATE | ZIP CODE | TELEPHONE |
|---|---|---|---|
| Latitude 32°33'10.1" North and Longitude 83°53'10.0" West | GA | 31030 | (912)825-7701 |

## OWNER/OPERATOR IDENTIFICATION

| OWNER | OPERATOR |
|---|---|
| Calvin Mason | Anne Jefferson<br>ASKA's Beauty Supply |
| **OWNER ADDRESS** 124 Main Street | **OPERATOR ADDRESS** 124 Main Street |
| **CITY** Fort Valley | **CITY** Fort Valley |

| STATE | ZIP CODE | TELEPHONE | STATE | ZIP CODE | TELEPHONE |
|---|---|---|---|---|---|
| GA | 31030 | (912)825-2500 | GA | 31030 | (912)825-5062 |

## SITE EVALUATION

| | | |
|---|---|---|
| **AGENCY/ORGANIZATION**<br>Georgia Department of Natural Resources | Georgia Environmental Protection Division | |
| **INVESTIGATOR**<br>Brent Rabon | Environmental Engineer | |
| **CONTACT**<br>Steve White | Environmental Specialist | |
| **ADDRESS**<br>205 Butler Street, SE<br>Floyd Towers East, Suite 1162 East | | |
| **CITY**<br>Atlanta | **STATE**<br>Georgia | **ZIP CODE**<br>30334 |
| **TELEPHONE**<br>(404)656-2833 | | |

# GENERAL INFORMATION

**Site Description and Operational History: Provide a brief description of the site and its operational history. State the name, owner, operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note whether these activities are documented or alleged. Identify all source types and prior spills, floods, or fires. Summarize highlights of the PA and other investigations. Cite references.**

The Former Dry Cleaners on Main Street is located within an area of mixed land usage which includes small businesses, restaurants, the McLean Water Plant of the Fort Valley Utilities Commission (location of Fort Valley Municipal Supply Well No. 1) and the Woolfolk Chemical Works Industrial Complex (Reference 2; Also See Figure 1). Tetrachloroethylene (PCE) has been detected in the Fort Valley Municipal Water Supply Wells Nos. 1 and 2 at concentration ranges of 1 ug/l to 18 ug/l and 1 ug/l to 16 ug/l, respectively (References 2 and 3), and the Former Dry Cleaners on Main Street is located within the wellhead protection area of both Municipal Water Supply Wells (Reference 1; Also See Figure 2).

Limited history is known of the Former Dry Cleaners on Main Street. According to Mr. Calvin Mason, the owner of this property, a Pressing Club associated with the Winona Hotel (also known as the Harris House) operated until approximately 1934 and was managed by Mr. Miles Johnson. According to Mr. Mason, the Pressing Club routinely dumped excess dry cleaning fluids on the ground and these fluids would drain from the Club along the then-unpaved preferential pathway shown in Figure 2. Mr. Mason also reported that a large number of pigs were killed on a farm in the City of Fort Valley in the early 1930s; these animals reportedly died from drinking contaminated water which drained from the Pressing Club and other businesses in the city at that time. The Winona Hotel was torn down in the early 1970s.

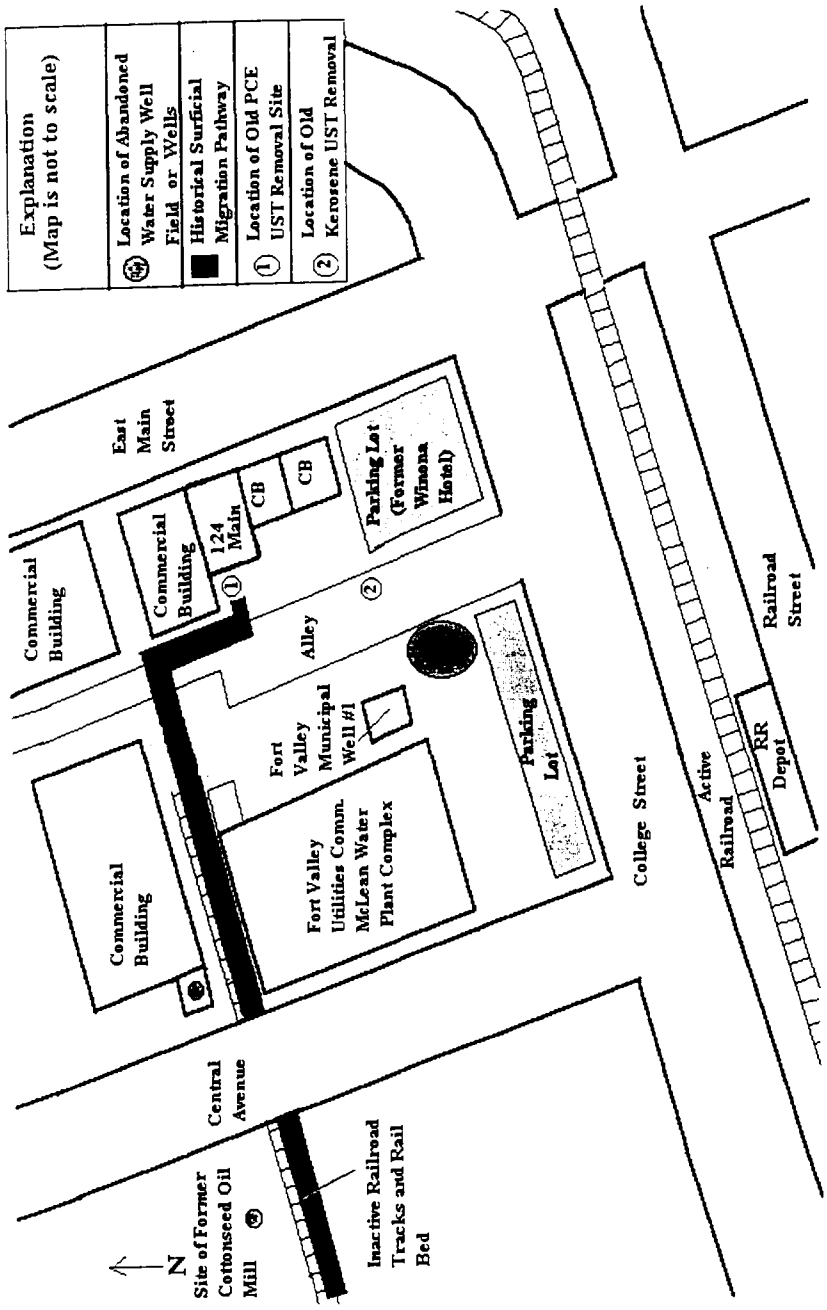
In February 1975, a tornado destroyed the Old Fort Valley Water and Light Building and heavily damaged the City of Fort Valley; Mr. Mason bought the property at 124 Main Street the following month. As part of the cleanup efforts in the aftermath of the tornado, the City of Fort Valley regraded the area behind Mr. Mason's store. During this effort in April 1978, an approximately 500-gallon Underground Storage Tank (UST) was discovered and removed. Mr. Mason stated that the tank contained a couple hundred gallons of liquid that he believed to be dry cleaning fluid and that the liquid and soils around the tank had a very strong kerosene-like odor. Contaminated soils were removed within the UST excavation to a depth of approximately eight (8) feet below the current ground surface (See location of UST No. 1 on Figure 2). Final disposition of the UST and the contaminated soils is unknown (References 1, 2, and 3).

During location of utility lines prior to sampling, Mr. Larry Dailey of the Fort Valley Utilities Commission stated that an additional UST containing kerosene was excavated by the city in April 1978. Mr. Dailey and his staff showed GA EPD staff the former location of the Kerosene UST in the alley (See location of UST No. 2 on Figure 2), and the SI Work Plan was modified in the field in order to collect soil samples from two (2) discrete depths at this location (Reference 5).

The Former Dry Cleaners on Main Street Site where the approximately 500-gallon believed to be associated with the Winona Hotel Pressing Club was discovered and removed is owned by Mr. Calvin Mason (See UST No. 1 in Figure 2); however, the City of Fort Valley owns the Alley behind 124 Main Street, the McLean Water Plant and the site of the Former Winona Hotel in the southwest quadrant of the site. The City of Fort Valley would, therefore, also own the property where the additional UST containing kerosene was discovered and excavated in April 1978 (Reference 5, Also see UST No. 2 in Figure 2).

## GENERAL INFORMATION (continued)

**Site Sketch:** Provide a sketch of the site. Indicate all pertinent features of the site and nearby environments including sources of wastes, areas of visible and buried wastes, buildings, residences, access roads, parking areas, fences, fields, drainage patterns, water bodies, vegetation, wells, sensitive environments, and other features.



## GENERAL INFORMATION (continued)

**Source Descriptions:** Describe all sources at the site. Identify source type and relate to waste disposal operations. Provide source dimensions and the best available waste quantity information. Describe the condition of sources and all containment structures. Cite references.

## SOURCE TYPES

**Landfill:** A man-made (by excavation or construction) or natural hole in the ground into which wastes have come to be disposed by backfilling, or by contemporaneous soil deposition with waste disposal.

**Surface Impoundment:** A natural topographic depression, man-made excavation, or diked area, primarily formed from earthen materials (lined or unlined) and designed to hold an accumulation of liquid wastes, wastes containing free liquids, or sludges not backfilled or otherwise covered; depression may be wet with exposed liquid or dry if deposited liquid has evaporated, volatilized or leached; structures that may be described as lagoon, pond, aeration pit, settling pond, tailings pond, sludge pit; also a surface impoundment that has been covered with soil after the final deposition of waste materials (i.e., buried or backfilled).

**Drum:** A portable container designed to hold a standard 55-gallon volume of wastes.

**Tank and Non-Drum Container:** Any device, other than a drum, designed to contain an accumulation of waste that provides structural support and is constructed primarily of fabricated materials (such as wood, concrete, steel, or plastic); any portable or mobile device in which waste is stored or otherwise handled.

**Contaminated Soil:** An area or volume of soil onto which hazardous substances have been spilled, spread, disposed, or deposited.

**Pile:** Any non-containerized accumulation above the ground surface of solid, non-flowing wastes; includes open dumps. Some types of waste piles are:

- Chemical Waste Pile: A pile consisting primarily of discarded chemical products, by-products, radioactive wastes, or used or unused feedstocks.
- Scrap Metal or Junk Pile: A pile consisting primarily of scrap metal or discarded durable goods (such as appliances, automobiles, auto parts, batteries, etc.) composed of materials containing hazardous substances.
- Tailings Pile: A pile consisting primarily of any combination of overburden from a mining operation and tailings from a mineral mining, beneficiation, or processing operation.
- Trash Pile: A pile consisting primarily of paper, garbage, or discarded non-durable goods containing hazardous substances.

**Land Treatment:** Landfarming or other method of waste management in which liquid wastes or sludges are spread over land and tilled, or liquids are injected at shallow depths into soils.

**Other:** Sources not in categories listed above.

# GENERAL INFORMATION (continued)

**Source Description:** Include description of containment per pathway for ground water (see HRS Table 3-2), surface water (HRS Table 4-2), and air (HRS Tables 6-3 and 6-9).

Source 1 - An approximately 500 gallon Underground Storage Tank (UST) reportedly used by the Former Dry Cleaner on Main Street. Groundwater Containment Factor Value of 10. Surface Water Containment Factor Value of 10. Air Containment Factor Value of 10.

Source 2 - An approximately 500 gallon UST containing kerosene discovered in the Alley behind 124 Main Street. Groundwater Containment Factor Value of 10. Surface Water Containment Factor Value of 10. Air Containment Factor Value of 10.

**Hazardous Waste Quantity (HWQ) Calculation:** SI Tables 1 and 2 (See HRS Tables 2-5, 2-6, and 5-2).

Source 1 WQ (UST No. 1) = 500 gallons
= 500 gallons(1.308 cubic yards/264.17 gallons)/2.5
= 0.99

Source 2 WQ (UST No. 2) = 500 gallons
= 500 gallons(1.308 cubic yards/264.17 gallons)/2.5
= 0.99

WQ = WQ (UST No. 1) + WQ(UST No. 2)
WQ = 0.99 + 0.99
WQ = 1.98

HWQ = 1

HWQ = 1

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## TABLE 1: HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

| | | Single Source Sites (assigned HWQ scores) | |
|---|---|---|---|
| (Column 1) TIER | (Column 2) Source Type | (Column 3) HWQ = 10 | (Column 4) HWQ = 100 |
| A Hazardous Constituent Quantity | N/A | HWQ = 1 if Hazardous Constituent Quantity data are complete<br>HWQ = 10 if Hazardous Constituent Quantity data are not complete | >100 to 10,000 lbs |
| B Hazardous Wastestream Quantity | N/A | ≤ 500,000 lbs | >500,000 to 50 million lbs |
| C Volume | Landfill | ≤ 6.75 million $ft^3$<br>≤ 250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ |
| | Surface impoundment | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| | Drums | ≤1,000 drums | >1,000 to 100,000 drums |
| | Tanks and non-drum containers | ≤50,000 gallons | >50,000 to 5 million gallons |
| | Contaminated soil | ≤6.75 million $ft^3$<br>≤250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ |
| | Pile | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| | Other | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ |
| Area | Landfill | ≤340,000 $ft^2$<br>≤7.8 acres | >340,000 to 34 million $ft^2$<br>>7.8 to 780 acres |
| | Surface impoundment | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres |
| | Contaminated soil | ≤3.4 million $ft^2$<br>≤78 acres | > 3.4 million to 340 million $ft^2$<br>> 78 to 7,800 acres |
| | Pile | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres |
| | Land treatment | ≤27,000 $ft^2$<br>≤0.62 acres | >27,000 to 2.7 million $ft^2$<br>>0.62 to 62 acres |

**TABLE 1 (CONTINUED)**

| Single Source Sites (assigned HWQ scores) | | Multiple Source Sites | | |
|---|---|---|---|---|
| (Column 5)<br>HWQ = 10,000 | (Column 6)<br>HWQ = 1,000,000 | (Column 7) Divisors for Assigning Source WQ Values | (Column 2)<br>Source Type | (Column 1)<br>TIER |
| >10,000 to 1 million lbs | > 1 million lbs | lbs ÷ 1 | N/A | **A**<br>Hazardous Constituent Quantity |
| >50 million to 5 billion lbs | > 5 billion lbs | lbs ÷ 5,000 | N/A | **B**<br>Hazardous Wastestream Quantity |
| >675 million to 67.5 billion $ft^3$<br>>25 million to 2.5 billion $yd^3$ | > 67.5 billion $ft^3$<br>> 2.5 billion $yd^3$ | $ft^3$ ÷ 67,500<br>$yd^3$ ÷ 2,500 | Landfill | **C**<br>Volume |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Surface Impoundment | |
| >100,000 to 10 million drums | > 10 million drums | drums ÷ 10 | Drums | |
| >5 million to 500 million gallons | > 500 million gallons | gallons ÷ 500 | Tanks and non-drum containers | |
| >675 million to 67.5 billion $ft^3$<br>>25 million to 2.5 billion $yd^3$ | > 67.5 billion $ft^3$<br>> 2.5 billion $yd^3$ | $ft^3$ ÷ 67,500<br>$yd^3$ ÷ 2,500 | Contaminated Soil | |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Pile | |
| >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | > 67.5 million $ft^3$<br>> 2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 | Other | |
| >34 million to 3.4 billion $ft^2$<br>>780 to 78,000 acres | > 3.4 billion $ft^2$<br>>78,000 acres | $ft^2$ ÷ 3,400<br>acres ÷ 0.078 | Landfill | **D**<br>Area |
| >130,000 to 13 million $ft^2$<br>>2.9 to 290 acres | > 13 million $ft^2$<br>> 290 acres | $ft^2$ ÷ 13<br>acres ÷ 0.00029 | Surface Impoundment | |
| > 340 million to 34 billion $ft^2$<br>> 7,800 to 780,000 acres | > 34 billion $ft^2$<br>> 780,000 acres | $ft^2$ ÷ 34,000<br>acres ÷ 0.78 | Contaminated Soil | |
| > 130,000 to 13 million $ft^2$<br>> 2.9 to 290 acres | > 13 million $ft^2$<br>> 290 acres | $ft^2$ ÷ 13<br>acres ÷ 0.00029 | Pile | |
| >2.7 million to 270 million $ft^2$<br>>62 to 6,200 acres | > 270 million $ft^2$<br>> 6,200 acres | $ft^2$ ÷ 270<br>acres ÷ 0.0062 | Land Treatment | |

## HAZARDOUS WASTE QUANTITY (HWQ) CALCULATION

For each migration pathway, evaluate HWQ associated with sources that are available (i.e., incompletely contained) to migrate to that pathway. (Note: If *Actual Contamination Targets* exist for ground water, surface water, or air migration pathways, assign the calculated HWQ score or 100, whichever is greater, as the HWQ score for that pathway.) For each source, evaluate HWQ for one or more of the four tiers (SI Table 1; HRS Table 2-5) for which data exist: constituent quantity, wastestream quantity, source volume, and source area. Select the tier that gives the highest value as the source HWQ. Select the source volume HWQ rather than source area HWQ if data for both tiers are available.

Column 1 of SI Table 1 indicates the quantity tier. Column 2 lists source types for the four tiers. Columns 3, 4, 5, and 6 provide ranges of waste amount for sites with only one source, corresponding to HWQ scores at the tops of the columns. Column 7 provides formulas to obtain source waste quantity values at sites with multiple sources.

1. Identify each source type.
2. Examine all waste quantity data available for each source. Record constituent quantity and waste stream mass or volume. Record dimensions of each source.
3. Convert source measurements to appropriate units for each tier to be evaluated.
4. For each source, use the formulas in the last column of SI Table 1 to determine the waste quantity value for each tier that can be evaluated. Use the waste quantity value obtained from the highest tier as the quantity value for the source.
5. Sum the values assigned to each source to determine the total site waste quantity.
6. Assign HWQ score from SI Table 2 (HRS Table 2-6).

Note these exceptions to evaluate soil exposure pathway HWQ (see HRS Table 5-2):

- The divisor for the area (square feet) of a landfill is 34,000.
- The divisor for the area (square feet) of a pile is 34.
- Wet surface impoundments and tanks and non-drum containers are the only sources for which volume measurements are evaluated for the soil exposure pathway.

**SI TABLE 2: HWQ SCORES FOR SITES**

| Site WQ Total | HWQ Score |
|---|---|
| 0 | 0 |
| 1[a] to 100 | 1[b] |
| > 100 to 10,000 | 100 |
| > 10,000 to 1 million | 10,000 |
| > 1 million | 1,000,000 |

[a] If the WQ total is between 0 and 1, round it to 1.
[b] If the hazardous constituent quantity data are not complete, assign the score of 10.

# SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

**Site Name:** Former Dry Cleaners on Main Street **References:** SCDM, Hawley Condensed Chemical Dictionary

**Sources:**

1. **An approximately 500 gallon UST reportedly used by the Former Dry Cleaners on Main Street**
2. **An approximately 500 gallon UST containing kerosene discovered in the Alley behind 124 Main Street**

| SOURCE | HAZARDOUS SUBSTANCE | TOXICITY | GROUND WATER PATHWAY | | SURFACE WATER PATHWAY | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | OVERLAND/FLOOD MIGRATION | | | | | | | GROUND WATER TO SURFACE WATER | | | |
| | | | GW Mobility (HRS Table 3-8) | Tox/ Mobility Value (HRS Table 3-9) | Per (HRS Tables 4-10 and 4-11) | Tox/Per Value (HRS Table 4-12) | Bioac Pot. (HRS Table 4-15) | Tox/pers/ Bioac Value (HRS Table 4-16) | Ecotox (HRS Table 4-19) | Ecotox/ Pers (HRS Table 4-20) | Ecotox/Pers/ Bioac Value (HRS Table 4-21) | Tox/Mob/ Pers Value (HRS Table 4-26) | Tox/Mob/ Pers/ Bioac Value (HRS Table 4-28) | Ecotox/ Mob/ Pers Value (HRS Table 4-29) | Ecotox/ Mob/ Per/ Bioac Value (HRS Table 4-30) |
| | Acetone | 10 | 1 | 10 | 0.0007 | 0.0070 | 0.5 | 0.0035 | 100 | 0.007 | .00035 | 0.007 | 0.0035 | 0.007 | 0.0035 |
| 2 | Toluene | 10 | 1 | 10 | 0.4 | 4 | 500 | 2,000 | 100 | 40 | 20,000 | 4 | 2000 | 40 | 20,000 |
| | Benzo[a]anthracene | 1000 | 2 E-07 | 2 E-04 | 1 | 1,000 | 50000 | 50000 | 10000 | 10000 | 5 E08 | 2 E-04 | 10 | 2 E-03 | 100 |
| | Benzo[a]pyrene | 10,000 | 2 E-07 | 2 E-03 | 1 | 10000 | 50000 | 50000 | 10000 | 10000 | 5 E08 | 2 E-03 | 100 | 2 E-04 | 10 |
| | Benzo[b]fluoranthene | 1000 | 2 E-09 | 2 E-06 | 1 | 1000 | 50000 | 50000 | 0 | 0 | 0 | 2 E-06 | 0.1 | 0 | 0 |
| | Benzo[g,h,i]perylene | -- | 2 E-09 | 2 E-09 | 1 | -- | 50000 | 50000 | 0 | 0 | 0 | 2 E-09 | 1 E-04 | 0 | 0 |
| | Benzo[k]fluoranthene | 100 | 2 E-09 | 2 E-07 | 1 | 100 | 50000 | 50000 | 0 | 0 | 0 | 2 E-07 | 1 E-02 | 0 | 0 |
| | Chrysene | 10 | 2 E-07 | 2 E-06 | 1 | 10 | 50000 | 50000 | 0 | 0 | 0 | 2 E-06 | 0.1 | 0 | 0 |
| | Fluoranthene | 100 | 2 E-05 | 2 E-03 | 1 | 100 | 50000 | 50000 | 10000 | 10000 | 5 E08 | 2 E-03 | 100 | 0.2 | 10000 |
| | Indeno[1,2,3-cd]pyrene | 1000 | 2 E-09 | 2 E-06 | 1 | 1000 | 50000 | 50000 | 0 | 0 | 0 | 2 E-06 | 0.1 | 0 | 0 |
| | Phenanthrene | -- | 0.002 | 2 E-03 | 1 | -- | 50000 | 50000 | 1000 | 1000 | 5 E07 | 2 E-03 | 100 | 2 | 100000 |
| | Pyrene | 100 | 2 E-05 | 2 E-03 | 1 | 100 | 50000 | 50000 | 10000 | 10000 | 5 E08 | 2 E-03 | 100 | 0.2 | 10000 |

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**Ground Water Observed Release Substances Summary Table**

On SI Table 4, list the hazardous substances associated with the site detected in ground water samples for that aquifer. Include only those substances directly observed or with concentrations significantly greater than background levels. Obtain toxicity values from the Superfund Chemical Data Matrix (SCDM). Assign mobility a value of 1 for all observed release substances regardless of the aquifer being evaluated. For each substance, multiply the toxicity by the mobility to obtain the toxicity/mobility factor value; enter the highest toxicity/mobility value for the aquifer in the space provided.

**Ground Water Actual Contamination Targets Summary Table**

If there is an observed release at a drinking water well, enter each hazardous substance meeting the requirements for an observed release by well and sample ID on SI Table 5 and record the detected concentration. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population using the well as a Level I target. If these percentages are less than 100% or all are N/A, evaluate the population using the well as a Level II target for that aquifer.

## SI TABLE 4: GROUND WATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

| Sample ID | Hazardous Substance | Bckgrd. Conc. | Toxicity/ Mobility | References |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | Highest Toxicity/Mobility | | |

NO HAZARDOUS SUBSTANCES DETECTED IN AQUIFER SAMPLED.

## SI TABLE 5: GROUND WATER ACTUAL CONTAMINATION TARGETS

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Well ID: _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# GROUND WATER PATHWAY
# GROUND WATER USE DESCRIPTION

**Describe Ground Water Use within 4 miles of the Site:**
Describe generalized stratigraphy, aquifers, municipal and private wells.

The City of Fort Valley is located in the Fort Valley Plateau District of the Coastal Plain physiographic province. The dominant feature of the Fort Valley Plateau District is a broad, flat topped topography with fewer streams and less local relief than adjacent districts. The City of Fort Valley is located in an outcrop area of the Lower Paleocene Clayton formation which consists of sandy brick-red clay and fine to coarse grained sand. The Clayton formation is underlain by the Providence Sand, Providence-Ripley-Cusetta, Blufftown-Eutaw, and Tuscaloosa formations.

The shallow most aquifer is the Clayton (or perched) aquifer which is composed 10-35 feet of silty fine sand. The Clayton aquifer is overlain by 10-15 feet of soil and a sandy clay unit, and underlain by an aerially extensive kaolin layer which ranges in thickness from 2-20 feet. Groundwater in the Clayton aquifer is under water table conditions, and depth to ground water in this aquifer is approximately 25-30 feet below land surface. The deepest aquifer in Fort Valley is the Tuscaloosa aquifer which occurs at a depth of about 250 feet below land surface. This aquifer is overlain by the Ripley/Blufftown - Eutaw semiconfining unit and groundwater in the Tuscaloosa aquifer occurs under confined conditions. The Tuscaloosa aquifer is the primary source of ground water to the high capacity wells in the area including Fort Valley City Municipal Water Supply Well Nos. 1, 2 and 5 (References 8 and 9).

The City of Fort Valley Supply System extracts groundwater from five (5) municipal supply wells which supply a total of 10,000 residents with drinking water (Reference 10). Fort Valley Municipal Water Supply Well Nos. 1, 2 and 5 are located within the the 1/4 mile radius and are serviced by the McLean Water Treatment Plant, and Municipal Water Supply Well Nos. 3 and 4 are located within the 1-2 mile radius and are serviced by the Jones Alley Water Plant. The Rolling Hills Mobile Home Park Supply System extracts groundwater from two (2) wells located at approximately the 3-mile radius (included in the 2-3 mile radius) and supplies groundwater to approximately 65 residents (Reference 10). Well depths for these seven (7) wells are in excess of 400 feet with production intervals below 200 feet below land surface. Yields range from 560 gallons per minute (gpm) to 1,397 gpm. Drawdowns for the wells average approximately 23 feet.

Residential groundwater users are also composed of residents who cannot access the City of Fort Valley and Rolling Hills Mobile Home Park Groundwater Supply Systems and/or residents who have opted to keep their own wells. In addition, irrigation for peach and pecan orchards consititutes significant groundwater usage within the Fort Valley area. Currently there are active irrigation permits for four (4) systems in the 1-2 mile radius, three (3) systems in the 2-3 mile radius, and eleven (11) systems in the 3-4 mile radius. Most of these wells are capable of producing in excess of 1,000 gpm each and may also be used for the watering of livestock (Reference 21). The Former Dry Cleaners on Main Street is located within the wellhead protection area of both Fort Valley Municipal Water Supply Well Nos. 1 and 2 (Reference 1).

**Show Calculations of Ground Water Drinking Water Populations for each Aquifer:**
Provide apportionment calculations for blended supply systems.
County average number of persons per household: 2.94 Reference 11

Although the city maintains five wells, the supplies are not necessarily blended. All wells are not continuously pumping and providing supplies to the community. Municipal Supply Well No. 5 is the primary supplier for the City of Fort Valley, serving 10,000 local and surrounding residents. The populations served by residential drinking water wells within a 4-mile radius of the site are as follows as reported by CENTRACTS (Reference 11, See Appendix D for the entire Frost Associates CENTRACTS Report) and Site Reconnaissance (References 1, 2, 3 and 5):

| | 0-1/4 mile | 1/4-1/2 mile | 1/2-1 mile | 1-2 miles | 2-3 miles | 3-4 miles |
|---|---|---|---|---|---|---|
| **Drilled Wells** | 3.76 | 2.87 | 11.90 | 62.54 | 110.27 | 127.52 |
| **Dug Wells** | .14 | .28 | 2.46 | 15.25 | 25.46 | 22.94 |
| **Total Wells** | 3.90 | 3.15 | 14.36 | 77.79 | 135.73 | 150.46 |
| **Population on Wells** | 10,002.97 | 9.90 | 37.24 | 229.34 | 462.03 | 442.08 |

R:\BRENTR\SISCORE.SHT\C14

# GROUND WATER PATHWAY WORKSHEET

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4. | | | |
| 2. POTENTIAL TO RELEASE: Depth to aquifer: ~25 feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3. | 500 | | 1,2 3,5 |
| LR = | 500 | | |

| TARGETS | | | |
|---|---|---|---|
| Are any wells part of a blended system? Yes____ No X<br>If yes, attach a page to show apportionment calculations.<br><br>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5).<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ **Total =** | 0 | | |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1. | 171 | | 11 |
| 5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles, assign 0. | 20 | | 11 |
| 6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a ground water observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0. | 5 | | 1 |
| 7. RESOURCES: Assign a score of 5 if one or more ground water resource applies; assign 0 if none applies.<br><br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering of commercial livestock<br>• Ingredient in commercial food preparation<br>• Supply for commercial aquaculture<br>• Supply for a major or designated water recreation area, excluding drinking water use | 5 | | 21 |
| **Sum of Targets T=** | 201 | | |

## SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS

### SI Table 6a: Other Than Karst Aquifers

| Distance from Site | Pop. | Nearest Well (choose highest) | Population Served by Wells within Distance Category | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to $\frac{1}{4}$ mile | 34 | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | 53 | 11 |
| > $\frac{1}{4}$ to $\frac{1}{2}$ mile | 115 | 18 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | 102 | 11 |
| > $\frac{1}{2}$ to 1 mile | 748 | 9 | 1 | 5 | 17 | 52 | 167 | 523 | 1,669 | 5,224 | 16,684 | 52,239 | 166,835 | 522,385 | 167 | 11 |
| > 1 to 2 miles | 2094 | 5 | 0.7 | 3 | 10 | 30 | 94 | 294 | 939 | 2,939 | 9,385 | 29,384 | 93,845 | 293,842 | 294 | 11 |
| > 2 to 3 miles | 3299 | 3 | 0.5 | 2 | 7 | 21 | 68 | 212 | 678 | 2,122 | 6,778 | 21,222 | 67,777 | 212,219 | 678 | 11 |
| >3 to 4 miles | 3325 | 2 | 0.3 | 1 | 4 | 13 | 42 | 131 | 417 | 1,306 | 4,171 | 13,060 | 41,709 | 130,596 | 417 | 11 |

**Nearest Well =** 20 **Sum =** 1711

REFERENCE - 11

## SI TABLE 6 (From HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS (continued)

### SI Table 6b: Karst Aquifers

| Distance from Site | Pop. | Nearest Well (choose highest) | Population Served by Wells within Distance Category | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to $\frac{1}{4}$ mile | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | | |
| $>\frac{1}{4}$ to $\frac{1}{2}$ mile | | 20 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | | |
| $>\frac{1}{2}$ to 1 mile | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| > 1 to 2 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| > 2 to 3 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| >3 to 4 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |

**Nearest Well =** [ ] **Sum =** [ ]

TABLE NOT APPLICABLE

## GROUND WATER PATHWAY WORKSHEET (concluded)

| WASTE CHARACTERISTICS | Score | Data Type | Does not Apply |
|---|---|---|---|
| 8. If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to ground water. | 1 | | |
| 9. Assign the highest ground water toxicity/mobility value from SI Table 3 or 4. | 10 | | |
| 10. Multiply the ground water toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7) | | | |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

WC = 2

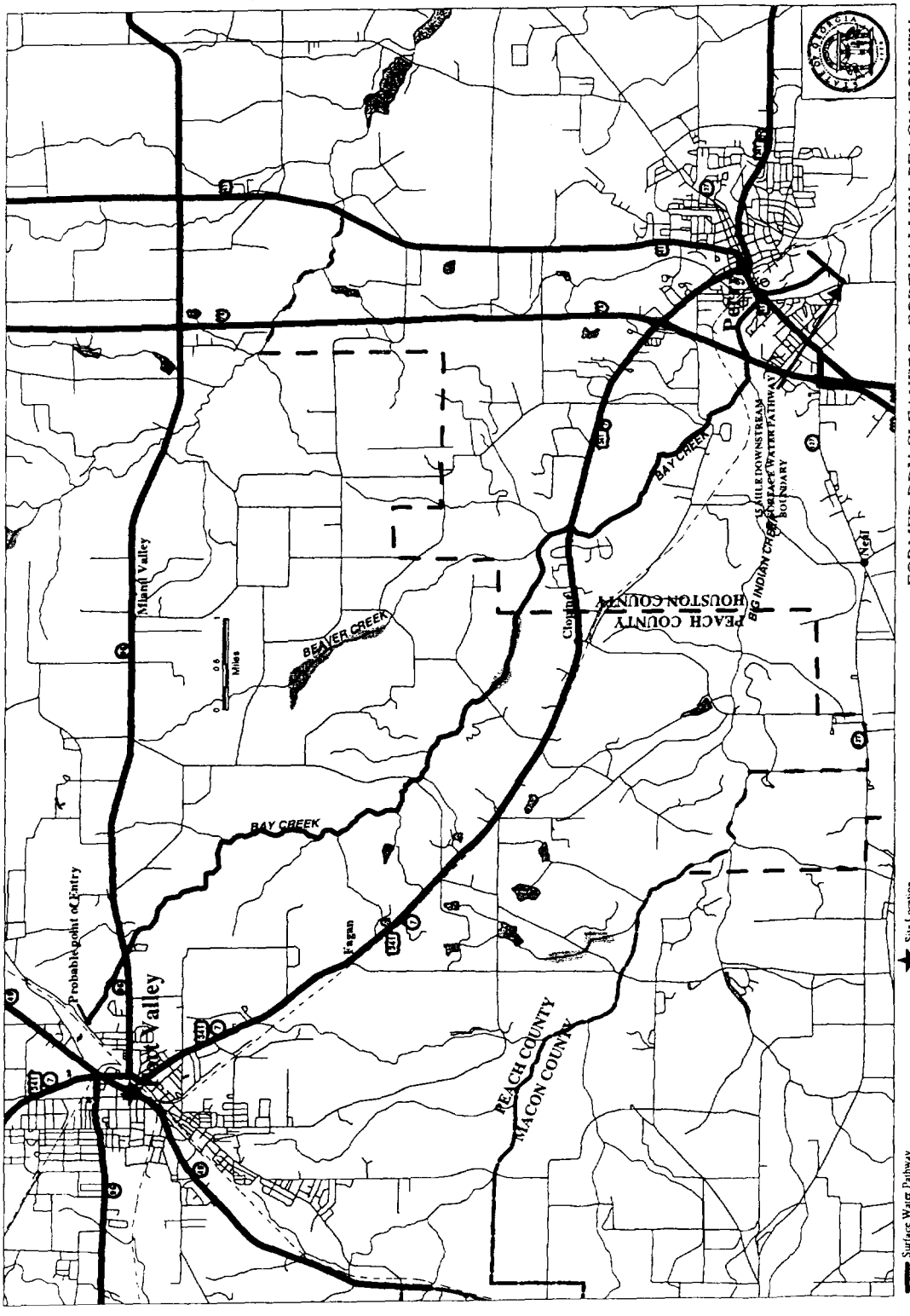
Multiply LR by T and by WC. Divide the product by 82,500 to obtain the ground water pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

**GROUND WATER PATHWAY SCORE:** $\frac{LR \times T \times WC}{82,500}$ = 2.43 (Maximum of 100)

$$\frac{500(201)(2)}{82500} = 2.43$$

# SURFACE WATER PATHWAY

**Sketch of the Surface Water Migration Route:**
Label all surface water bodies. Include runoff route and drainage direction, probable point of entry, and 15-mile target distance limit. Mark sample locations, intakes, fisheries, and sensitive environments. Indicate flow directions, tidal influence, and rate.



## SURFACE WATER PATHWAY

### Surface Water Observed Release Substances Summary Table

On SI Table 7, list the hazardous substances detected in surface water samples for the watershed, which can be attributed to the site. Include only those substances in observed releases (direct observation) or with concentration levels significantly above background levels. Obtain toxicity, persistence, bioaccumulation potential, and ecotoxicity values from SCDM. Enter the highest toxicity/persistence, toxicity/persistence/bioaccumulation, and ecotoxicity/persistence/ecobioaccumulation values in the spaces provided.

- TP = Toxicity x Persistence
- TPB = TP x bioaccumulation
- ETPB = EP x bioaccumulation (EP = ecotoxicity x persistence)

### Drinking Water Actual Contamination Targets Summary Table

For an observed release at or beyond a drinking water intake, on SI Table 8 enter each hazardous substance by sample ID and the detected concentration. For surface water sediment samples detecting a hazardous substance at or beyond an intake, evaluate the intake as Level II contamination. Obtain benchmark, cancer risk, and reference dose concentrations for each substance from SCDM. For MCL and MCLG benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages of the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the population served by the intake as a Level I target. If the percentages are less than 100% or all are N/A, evaluate the population served by the intake as a Level II target.

## SI TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

| Sample ID | Hazardous Substance | Bckgrd. Conc. | Toxicity/ Persistence | Toxicity/ Persis./ Bioaccum | Ecotoxicity/ Persis/ Ecobioaccum | References |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | Highest Values | | | | |

NO SURFACE WATER SAMPLES COLLECTED

## SI TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Intake ID: _____ Sample Type _____ Level I _____ Level II _____ Population Served _____ References _____

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# SURFACE WATER PATHWAY
## LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

| LIKELIHOOD OF RELEASE– OVERLAND/FLOOD MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. | | | |
| 2. POTENTIAL TO RELEASE: Distance to surface water: 7392 (feet) If sampling data do not support a release to surface water in the watershed, use the table below to assign a score from the table below based on distance to surface water and flood frequency. | | | 13 |
| Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2 | 100 | | 14 |
| LR = | 100 | | |

| Distance to surface water <2500 feet | 500 |
|---|---|
| Distance to surface water >2500 feet, and: | |
| Site in annual or 10-yr floodplain | 500 |
| Site in 100-yr floodplain | 400 |
| Site in 500-yr floodplain | 300 |
| Site outside 500-yr floodplain | 100 |

| LIKELIHOOD OF RELEASE N/A GROUND WATER TO SURFACE WATER MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7.<br><br>NOTE: Evaluate ground water to surface water migration only for a surface water body that meets all of the following conditions:<br><br>1) A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0.<br>2) No aquifer discontinuity is established between the source and the above portion of the surface water body.<br>3) The top of the uppermost aquifer is at or above the bottom of the surface water.<br>Elevation of top of uppermost aquifer _____<br>Elevation of bottom of surface water body _____ | | | |
| 2. POTENTIAL TO RELEASE: Use the ground water potential to release. Optionally, evaluate surface water potential to release according to HRS Section 3.1.2. | | | |
| LR = | | | |

# SURFACE WATER PATHWAY
## LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET (CONTINUED)

| DRINKING WATER THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type, flow, and number of people served by each drinking water intake within the target distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5.<br><br>Intake Name ____ Water Body Type ____ Flow ____ People Served ____<br>____ ____ ____ ____<br>____ ____ ____ ____<br>____ ____ ____ ____<br><br>Are any intakes part of a blended system? Yes _____ No _____<br>If yes, attach a page to show apportionment calculations.<br><br>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8).<br><br>_____ , _____<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ **Total =** | 0 | | 13,14<br>16,19 |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1. | 0 | | 13,14<br>16,19 |
| 5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0. | 0 | | 13,14,<br>16,19 |
| 6. RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign 0 if none applies.<br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering of commercial livestock<br>• Ingredient in commercial food preparation<br>• Major or designated water recreation area, excluding drinking water use | 0 | | 13,14<br>16,19 |
| **SUM OF TARGETS T=** | 0 | | |

## SI TABLE 9 (From HRS Table 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY

N/A

| Type of Surface Water Body | Pop. | Nearest Intake | Number of people | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0 | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,000 | 10,001 to 30,000 | |
| Minimal Stream (<10 cfs) | | 20 | 0 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | |
| Small to moderate stream (10 to 100 cfs) | | 2 | 0 | 0.4 | 2 | 5 | 16 | 52 | 163 | 521 | 1,633 | |
| Moderate to large stream (> 100 to 1,000 cfs) | | 0 | 0 | 0.04 | 0.2 | 0.5 | 2 | 5 | 16 | 52 | 163 | |
| Large Stream to river (>1,000 to 10,000 cfs) | | 0 | 0 | 0.004 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | 5 | 16 | |
| Large River (> 10,000 to 100,000 cfs) | | 0 | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 16 | |
| Very Large River (>100,000 cfs) | | 0 | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Shallow ocean zone or Great Lake (depth < 20 feet) | | 0 | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | |
| Moderate ocean zone or Great Lake (Depth 20 to 200 feet) | | 0 | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Deep ocean zone or Great Lake (depth > 200 feet) | | 0 | 0 | 0 | 0 | 0 | 0.001 | 0.003 | 0.008 | 0.03 | 0.08 | |
| 3-mile mixing zone in quiet flowing river (≥ 10 cfs) | | 10 | 0 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | |

Nearest Intake = [ ]

Sum = [ ]

References _____

## SURFACE WATER PATHWAY

### Human Food Chain Actual Contamination Targets Summary Table

On SI Table 10, list the hazardous substances detected in sediment, aqueous, sessile benthic organism tissue, or fish tissue samples (taken from fish caught within the boundaries of the observed release) by sample ID and concentration. Evaluate fisheries within the boundaries of observed releases detected by sediment or aqueous samples as Level II, if at least one observed release substance has a bioaccumulation potential factor value of 500 or greater (see SI Table 7). Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For FDAAL benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate this portion of the fishery as subject to Level I concentrations. If the percentages are less than 100% or all are N/A, evaluate the fishery as a Level II target.

### Sensitive Environment Actual Contamination Targets Summary Table

On SI Table 11, list each hazardous substance detected in aqueous or sediment samples at or beyond wetlands or a surface water sensitive environment by sample ID. Record the concentration. If contaminated sediments or tissues are detected at or beyond a sensitive environment, evaluate the sensitive environment as Level II. Obtain benchmark concentrations from SCDM. For AWQC/AALAC benchmarks, determine the highest percentage of benchmark of the substances detected in aqueous samples. If benchmark concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage equals or exceeds 100%, evaluate that part of the sensitive environment subject to Level I concentrations. If the percentage is less than 100%, or all are N/A, evaluate the sensitive environment as Level II.

NOT APPLICABLE; NO SEDIMENT, SURFACE WATER OR TISSUE SAMPLES COLLECTED.

**SI TABLE 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED**

Fishery ID: _____ Sample Type _____ Level I _____ Level II _____ References _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Benchmark Concentration (FDAAL) | % of Benchmark | Cancer Risk Concentration. | % of Cancer Risk Concentration | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

**SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED**

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

| Sample ID | Hazardous Substance | Conc.. (µg/L) | Benchmark Concentration (AWQC or AALAC) | % of Benchmark | References |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | Highest Percent | | |

Environment ID: _____ Sample Type _____ Level I _____ Level II _____ Environment Value _____

| Sample ID | Hazardous Substance | Conc.. (µg/L) | Benchmark Concentration (AWQC or AALAC) | % of Benchmark | References |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | Highest Percent | | |

## SURFACE WATER PATHWAY (continued)
## HUMAN FOOD CHAIN THREAT WORKSHEET

| HUMAN FOOD CHAIN THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page. | | | |

Fishery Name_____ Water Body_____ Flow_____cfs

Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

Fishery Name_____ Water Body_____ Flow_____cfs

Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

Fishery Name_____ Water Body_____ Flow_____cfs

Species_____ Production_____lbs/yr
Species_____ Production_____lbs/yr

FOOD CHAIN INDIVIDUAL

7. ACTUAL CONTAMINATION FISHERIES:

If analytical evidence indicates that a fishery has been exposed to a hazardous substance with a bioaccumulation factor greater than or equal to 500 (SI Table 10), assign a score of 50 if there is a Level I fishery. Assign 45 if there is a Level II fishery, but no Level I fishery.

8. POTENTIAL CONTAMINATION FISHERIES:

If there is a release of a substance with a bioaccumulation factor greater than or equal to 500 to a watershed containing fisheries within the target distance limit, but there are no Level I or Level II fisheries, assign a score of 20.

If there is no observed release to the watershed, assign a value for potential contamination fisheries from the table below using the lowest flow at all fisheries within the target distance limit:

| Lowest Flow | FCI Value |
|---|---|
| <10 cfs | 20 |
| 10 to 100 cfs | 2 |
| >100 cfs, coastal tidal waters, oceans, or Great Lakes | 0 |
| 3-mile mixing zone in quiet flowing river | 10 |

**FCI Value =** 2 (Refs: 13)

**SUM OF TARGETS T =** 2

## SURFACE WATER PATHWAY (continued)
## ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

| ENVIRONMENTAL THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type and flow for each surface water sensitive environment within the target distance (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of 0 at the bottom of the page. | | | |

| Environment Name | Water Body Type | Flow |
|---|---|---|
| WETLAND | MINIMAL STREAM | <10 cfs |
| | | cfs |
| | | cfs |
| | | cfs |
| | | cfs |

9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table 11, and assign a factor value for the environment (SI Tables 13 and 14).

| Environment Name | Environment Type and Value (SI Tables 13 & 14) | Multiplier (10 for Level I, 1 for Level II) | Product |
|---|---|---|---|
| | | x = | |
| | | x = | |
| | | x = | |
| | | x = | |
| | | Sum = | N/A |

10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:

| Flow | Dilution Weight (SI Table 12) | Environment Type and Value (SI Tables 13 & 14) | Pot. Cont. | Product |
|---|---|---|---|---|
| cfs | 1 x | 25 x | 0.1 = | 2.5 |
| cfs | x | x | 0.1 = | |
| cfs | x | x | 0.1 = | |
| cfs | x | x | 0.1 = | |
| cfs | x | x | 0.1 = | |
| | | | Sum = | 2.5 |

Refs: 16

T = 2.5

## SI TABLE 12 (HRS Table 4-13): SURFACE WATER DILUTION WEIGHTS

| Type of Surface Water Body | | Assigned Dilution Weight |
|---|---|---|
| **Descriptor** | **Flow Characteristics** | |
| Minimal stream | < 10 cfs | 1 |
| Small to moderate stream | 10 to 100 cfs | 0.1 |
| Moderate to large stream | > 100 to 1,000 cfs | 0.01 |
| Large stream to river | > 1,000 to 10,000 cfs | 0.001 |
| Large river | > 10,000 to 100,000 cfs | 0.0001 |
| Very large river | > 100,000 cfs | 0.00001 |
| Coastal tidal waters | Flow not applicable; depth not applicable | 0.001 |
| Shallow ocean zone or Great Lake | Flow not applicable; depth less than 20 feet | 0.001 |
| Moderate depth ocean zone or Great Lake | Flow not applicable; depth 20 to 200 feet | 0.0001 |
| Deep ocean zone or Great Lake | Flow not applicable; depth greater than 200 feet | 0.000005 |
| 3-mile mixing zone in quiet flowing river | 10 cfs or greater | 0.5 |

## SI TABLE 13 (HRS TABLE 4-23): SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

| *SENSITIVE ENVIRONMENT* | *ASSIGNED VALUE* |
|---|---|
| Critical habitat for Federal designated endangered or threatened species<br>Marine Sanctuary<br>National Park<br>Designated Federal Wilderness Area<br>Ecologically important areas identified under the Coastal Zone Wilderness Act<br>Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act<br>Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes)<br>National Monument (air pathway only)<br>National Seashore Recreation Area<br>National Lakeshore Recreation Area | 100 |
| Habitat known to be used by Federal designated or proposed endangered or threatened species<br>National Preserve<br>National or State Wildlife Refuge<br>Unit of Coastal Barrier Resources System<br>Coastal Barrier (undeveloped)<br>Federal land designated for the protection of natural ecosystems<br>Administratively Proposed Federal Wilderness Area<br>Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary<br>Migratory pathways and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time<br>Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding<br>National river reach designated as recreational | 75 |
| Habitat known to be used by State designated endangered or threatened species<br>Habitat known to be used by a species under review as to its Federal endangered or threatened status<br>Coastal Barrier (partially developed)<br>Federally designated Scenic or Wild River | 50 |
| State land designated for wildlife or game management<br>State designated Scenic or Wild River<br>State designated Natural Area<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |
| State designated areas for the protection of maintenance of aquatic life under the Clean Water Act | 5 |
| Wetlands See SI Table 14 (Surface Water Pathway) or SI Table 23 (Air Pathway) | |

## SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

| Total Length of Wetlands | Assigned Value |
|---|---|
| Less than 0.1 mile | 0 |
| 0.1 to 1 mile | 25 |
| Greater than 1 to 2 miles | 50 |
| Greater than 2 to 3 miles | 75 |
| Greater than 3 to 4 miles | 100 |
| Greater than 4 to 8 miles | 150 |
| Greater than 8 to 12 miles | 250 |
| Greater than 12 to 16 miles | 350 |
| Greater than 16 to 20 miles | 450 |
| Greater than 20 miles | 500 |

## SURFACE WATER PATHWAY (concluded)
### WASTE CHARACTERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

**WASTE CHARACTERISTICS** — Score

| | |
|---|---|
| 14. If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, assign the calculated hazardous waste quantity score, or a score of 100, whichever is greater. | 100 |

15. Assign the highest value from SI Table 7 (observed release) or SI Table 3 (no observed release) for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat.

| | Substance Value | | HWQ | | Product | WC Score (from Table) (Maximum of 100) |
|---|---|---|---|---|---|---|
| Drinking Water Threat Toxicity/Persistence | 4 | x | 100 | = | 400 | 3 |
| Food Chain Threat Toxicity/Persistence Bioaccumulation | 2000 | x | 100 | = | 2E05 | 18 |
| Environmental Threat Ecotoxicity/Persistence/ Ecobioaccumulation | 100,000 | x | 100 | = | 1E07 | 56 |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 to <1E + 09 | 100 |
| 1E + 09 to <1E + 10 | 180 |
| 1E + 10 to <1E + 11 | 320 |
| 1E + 11 to <1E + 12 | 560 |
| 1E + 12 or greater | 1000 |

**SURFACE WATER PATHWAY THREAT SCORES**

| Threat | Likelihood of Release (LR) Score | Targets (T) Score | Pathway Waste Characteristics (WC) Score (determined above) | Threat Score $\frac{LR \times T \times WC}{82,500}$ |
|---|---|---|---|---|
| Drinking Water | 100 | 0 | 3 | (maximum of 100) 0 |
| Human Food Chain | 100 | 2 | 18 | (maximum of 100) 0.044 |
| Environmental | 100 | 2.5 | 56 | (maximum of 60) 0.170 |

**SURFACE WATER PATHWAY SCORE (Drinking Water Threat + Human Food Chain Threat + Environmental Threat)** — (maximum of 100) 0.21

## SOIL EXPOSURE PATHWAY

If there is no observed contamination (e.g., ground water plume with no known surface source), do not evaluate the soil exposure pathway. Discuss evidence for no soil exposure pathway.

### Soil Exposure Resident Population Targets Summary

For each property (duplicate page 35 as necessary):

If there is an area of observed contamination on the property and within 200 feet of a residence, school, or day care center, enter on Table 15 each hazardous substance by sample ID. Record the detected concentration. Obtain cancer risk, and reference dose concentrations from SCDM. Sum the cancer risk and reference dose percentages for the substances listed. If cancer risk or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate the residents and students as Level I. If both percentages are less than 100% or all are N/A, evaluate the targets as Level II.

NOT APPLICABLE ; MINOR SOIL CONTAMINATION DETECTED IS NOT WITHIN 200 FEET OF A RESIDENCE, SCHOOL OR DAY CARE CENTER (P.C-34)

## SI TABLE 15: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Residence ID: _____ Level I _____ Level II _____ Population _____

| Sample ID | Hazardous Substance | Conc. (mg/kg) | Cancer Risk Concentration | % of Cancer Risk Conc. | RfD | % of RfD | Toxicity Value | References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# SOIL EXPOSURE PATHWAY WORKSHEET
# RESIDENT POPULATION THREAT

| LIKELIHOOD OF EXPOSURE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0. | | | 22 |
| LE = | 0 | | |

THEREFORE, THE REMAINDER OF THE SOIL EXPOSURE PATHWAY WORKSHEETS ARE N/A.

| TARGETS | | | |
|---|---|---|---|
| 2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on or within 200 feet of areas of observed contamination (HRS section 5.1.3).<br><br>Level I: _____ people x 10 = _____<br>Level II: _____ people x 1 = _____ **Sum =** | | | |
| 3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (*i.e.*, no Level I or Level II targets), assign 0 (HRS Section 5.1.3). | | | |
| 4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities with areas of observed contamination associated with the site. | | | |

| Number of Workers | Score |
|---|---|
| 0 | 0 |
| 1 to 100 | 5 |
| 101 to 1,000 | 10 |
| >1,000 | 15 |

| | | | |
|---|---|---|---|
| 5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination. | | | |

| Terrestrial Sensitive Environment Type | Value |
|---|---|
| | |
| | |
| | |
| | |
| | |

| | | | |
|---|---|---|---|
| **Sum =** | | | |
| 6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on an area of observed contamination at the site; assign 0 if none applies.<br>• Commercial agriculture<br>• Commercial silviculture<br>• Commercial livestock production or commercial livestock grazing | | | |
| **Total of Targets** T= | | | |

## SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

| *TERRESTRIAL SENSITIVE ENVIRONMENT* | *ASSIGNED VALUE* |
|---|---|
| Terrestrial critical habitat for Federal designated endangered or threatened species<br>National Park<br>Designated Federal Wilderness Area<br>National Monument | 100 |
| Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species<br>National Preserve (terrestrial)<br>National or State terrestrial Wildlife Refuge<br>Federal land designated for protection of natural ecosystems<br>Administratively proposed Federal Wilderness Area<br>Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding | 75 |
| Terrestrial habitat used by State designated endangered or threatened species<br>Terrestrial habitat used by species under review for Federal designated endangered or threatened status | 50 |
| State lands designated for wildlife or game management<br>State designated Natural Areas<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |

## SOIL EXPOSURE PATHWAY WORKSHEET
## NEARBY POPULATION THREAT

| LIKELIHOOD OF EXPOSURE | Score | Data Type | Ref. |
|---|---|---|---|
| 7. Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6) Value _____<br><br>Area of Contamination (from SI Table 18 or HRS Table 5-7) Value _____<br><br>Likelihood of Exposure (from SI Table 19 or HRS Table 5-8) | | | |
| LE = | | | |

| TARGETS | Score | Data Type | Ref. |
|---|---|---|---|
| 8. Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated. | | | |
| 9. Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (*i.e.*, properties that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS Table 5-10). Sum the population values and multiply by 0.1. | | | |
| T = | | | |

## SI TABLE 17 (HRS TABLE 5-6): ATTRACTIVENESS/ACCESSIBILITY VALUES

| Area of Observed Contamination | Assigned Value |
|---|---|
| Designated recreational area | 100 |
| Regularly used for public recreation (for example, vacant lots in urban area) | 75 |
| Accessible and unique recreational area (for example, vacant lots in urban area) | 75 |
| Moderately accessible (may have some access improvements–for example, gravel road) with some public recreation use | 50 |
| Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use | 25 |
| Accessible with no public recreation use | 10 |
| Surrounded by maintained fence or combination of maintained fence and natural barriers | 5 |
| Physically inaccessible to public, with no evidence of public recreation use | 0 |

## SI TABLE 18 (HRS TABLE 5-7): AREA OF CONTAMINATION FACTOR VALUES

| Total area of the areas of observed contamination (square feet) | Assigned Value |
|---|---|
| ≤ to 5,000 | 5 |
| > 5,000 to 125,000 | 20 |
| > 125,000 to 250,000 | 40 |
| > 250,000 to 375,000 | 60 |
| > 375,000 to 500,000 | 80 |
| > 500,000 | 100 |

## SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

| AREA OF CONTAMINATION FACTOR VALUE | ATTRACTIVENESS/ACCESSIBILITY FACTOR VALUE | | | | | | |
|---|---|---|---|---|---|---|---|
| | 100 | 75 | 50 | 25 | 10 | 5 | 0 |
| 100 | 500 | 500 | 375 | 250 | 125 | 50 | 0 |
| 80 | 500 | 375 | 250 | 125 | 50 | 25 | 0 |
| 60 | 375 | 250 | 125 | 50 | 25 | 5 | 0 |
| 40 | 250 | 125 | 50 | 25 | 5 | 5 | 0 |
| 20 | 125 | 50 | 25 | 5 | 5 | 5 | 0 |
| 5 | 50 | 25 | 5 | 5 | 5 | 5 | 0 |

## SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

| Travel Distance Category (miles) | Pop. | Number of people within the travel distance category | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,001 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | |
| Greater than 0 to $\frac{1}{4}$ | | 0 | 0.1 | 0.4 | 1.0 | 4 | 13 | 41 | 130 | 408 | 1,303 | 4,081 | 13,034 | |
| Greater than $\frac{1}{4}$ to $\frac{1}{2}$ | | 0 | 0.05 | 0.2 | 0.7 | 2 | 7 | 20 | 65 | 204 | 652 | 2,041 | 6,517 | |
| Greater than $\frac{1}{2}$ to 1 | | 0 | 0.02 | 0.1 | 0.3 | 1 | 3 | 10 | 33 | 102 | 326 | 1,020 | 3,258 | |

Reference(s) _____ Sum = _____

## SOIL EXPOSURE PATHWAY WORKSHEET (concluded)

**WASTE CHARACTERISTICS**

| | | |
|---|---|---|
| 10. | Assign the hazardous waste quantity score calculated for soil exposure | |
| 11. | Assign the highest toxicity value from SI Table 16 | |
| 12. | Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: | WC = |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

**RESIDENT POPULATION THREAT SCORE:**

(Likelihood of Exposure, Question 1;
Targets = Sum of Questions 2, 3, 4, 5, 6)

**LE X T X WC**
**82,500**

**NEARBY POPULATION THREAT SCORE:**

(Likelihood of Exposure, Question 7;
Targets = Sum of Questions 8, 9)

**LE X T X WC**
**82,500**

**SOIL EXPOSURE PATHWAY SCORE:**
**Resident Population Threat + Nearby Population Threat**

0
(Maximum of 100)

BECAUSE LE = 0
(SEE PAGE C-36)

## AIR PATHWAY

### Air Pathway Observed Substances Summary Table

On SI Table 21, list the hazardous substances detected in air samples of a release from the site. Include only those substances with concentrations significantly greater than background levels. Obtain benchmark, cancer risk, and reference dose concentrations from SCDM. For NAAQS/NESHAPS benchmarks, determine the highest percentage of benchmark obtained for any substance. For cancer risk and reference dose, sum the percentages for the substances listed. If benchmark, cancer risk, or reference dose concentrations are not available for a particular substance, enter N/A for the percentage. If the highest benchmark percentage or the percentage sum calculated for cancer risk or reference dose equals or exceeds 100%, evaluate targets in the distance category from which the sample was taken and any closer distance categories as Level I. If the percentages are less than 100% or all are N/A, evaluate targets in that distance category and any closer distance categories that are not Level I as Level II.

* NO AIR SAMPLES WERE COLLECTED.

## SI TABLE 21: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References_____

| Hazardous Substance | Conc. (µg/m³) | Gaseous Particulate | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References_____

| Hazardous Substance | Conc. (µg/m³) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Sample ID: _____ Level I _____ Level II _____ Distance from Sources (mi) ____ References_____

| Hazardous Substance | Conc. (µg/m³) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | Cancer Risk Conc. | % of Cancer Risk Conc. | RfD | % of RfD |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Toxicity/ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

# AIR PATHWAY WORKSHEET

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to air, assign a score of 550. Record observed release substances on SI Table 21. | | | |
| 2. POTENTIAL TO RELEASE: If sampling data do not support a release to air, assign a score of 500. Optionally, evaluate air migration gaseous and particulate potential to release (HRS Section 6.1.2). | 500 | | 22 |
| LR = | 500 | | |

| TARGETS | | | |
|---|---|---|---|
| 3. ACTUAL CONTAMINATION POPULATION: Determine the number of people within the target distance limit subject to exposure from a release of a hazardous substance to the air.<br>a) Level I: _____ people x 10 = _____<br>b) Level II: _____ people x 1 = _____ Total = | 0 | | |
| 4. POTENTIAL TARGET POPULATION: Determine the number of people within the target distance limit not subject to exposure from a release of a hazardous substance to the air, and assign the total population score from SI Table 22. Sum the values and multiply the sum by 0.1. | 5.7 | | 11 |
| 5. NEAREST INDIVIDUAL: Assign a score of 50 if there are any Level I targets. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Population exists, assign the Nearest Individual score from SI Table 22. | 20 | | 11 |
| 6. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (SI Table 13) and wetland acreage values (SI Table 23) for environments subject to exposure from the release of a hazardous substance to the air. | 0 | | |
| 7. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release. | 0 | | |
| 8. RESOURCES: Assign a score of 5 if one or more air resources apply within 1/2 mile of a source; assign a 0 if none applies.<br>• Commercial agriculture<br>• Commercial silviculture<br>• Major or designated recreation area | 5 | | 1, 2<br>3, 4 |
| T = | 30.7 | | |

| Sensitive Environment Type | Value |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

| Wetland Acreage | Value |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

## SI TABLE 22 (From HRS TABLE 6-17): VALUES FOR POTENTIAL CONTAMINATION AIR TARGET POPULATIONS

| Distance from Site | Pop. | Nearest Individual (choose highest) | Number of People within the Distance Category | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | |
| On a source | 0 | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | 0 |
| 0 to $\frac{1}{4}$ mile | 34 | * | 1 | 4 | 13 | 41 | 131 | 408 | 1,304 | 4,081 | 13,034 | 40,812 | 130,340 | 408,114 | 13 |
| $>\frac{1}{4}$ to $\frac{1}{2}$ mile | 115 | 2 | 0.2 | 0.9 | 3 | 9 | 28 | 88 | 282 | 882 | 2,815 | 8,815 | 28,153 | 88,153 | 9 |
| $>\frac{1}{2}$ to 1 mile | 748 | 1 | 0.06 | 0.3 | 0.9 | 3 | 8 | 26 | 83 | 261 | 834 | 2,612 | 8,342 | 26,119 | 8 |
| > 1 to 2 miles | 2094 | 0 | 0.02 | 0.09 | 0.3 | 0.8 | 3 | 8 | 27 | 83 | 266 | 833 | 2,659 | 8,326 | 8 |
| > 2 to 3 miles | 3299 | 0 | 0.009 | 0.04 | 0.1 | 0.4 | 1 | 4 | 12 | 38 | 120 | 375 | 1,199 | 3,755 | 12 |
| >3 to 4 miles | 3325 | 0 | 0.005 | 0.02 | 0.07 | 0.2 | 0.7 | 2 | 7 | 28 | 73 | 229 | 730 | 2,285 | 7 |

**Nearest Individual =** 20

**Sum =** 57

**References** 11

* Score = 20 if the Nearest Individual is within $\frac{1}{8}$ mile of a source; score = 7 if the Nearest Individual is between $\frac{1}{8}$ and $\frac{1}{4}$ mile of a source.

## SI TABLE 23 (HRS TABLE 6-18): AIR PATHWAY VALUES FOR WETLAND AREA

| Wetland Area | Assigned Value |
|---|---|
| < 1 acre | 0 |
| 1 to 50 acres | 25 |
| > 50 to 100 acres | 75 |
| > 100 to 150 acres | 125 |
| > 150 to 200 acres | 175 |
| > 200 to 300 acres | 250 |
| > 300 to 400 acres | 350 |
| > 400 to 500 acres | 450 |
| > 500 acres | 500 |

## SI TABLE 24: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS

| Distance | Distance Weight | Sensitive Environment Type and Value (from SI Tables 13 and 20) | Product |
|---|---|---|---|
| On a Source | 0.10 | x | |
| | | x | |
| 0 to 1/4 mile | 0.025 | x | |
| | | x | |
| | | x | |
| 1/4 to 1/2 mile | 0.0054 | x | |
| | | x | |
| | | x | |
| 1/2 to 1 mile | 0.0016 | x | |
| | | x | |
| | | x | |
| 1 to 2 miles | 0.0005 | x | |
| | | x | |
| | | x | |
| 2 to 3 miles | 0.00023 | x | |
| | | x | |
| | | x | |
| 3 to 4 miles | 0.00014 | x | |
| | | x | |
| | | x | |
| > 4 miles | 0 | x | |

**Total Environments Score =** _____

## AIR PATHWAY (concluded)

### WASTE CHARACTERISTICS

| | |
|---|---|
| 9. If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculated HWQ score for sources available to air migration. | 100 |
| 10. Assign the highest air toxicity/mobility value from SI Table 21. | 0 |
| 11. Multiply the air pathway toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: | WC = 0 |

| Product | WC Score |
|---|---|
| 0 | 0 |
| >0 to <10 | 1 |
| 10 to <100 | 2 |
| 100 to <1,000 | 3 |
| 1,000 to < 10,000 | 6 |
| 10,000 to <1E + 05 | 10 |
| 1E + 05 to <1E + 06 | 18 |
| 1E + 06 to <1E + 07 | 32 |
| 1E + 07 to <1E + 08 | 56 |
| 1E + 08 or greater | 100 |

**AIR PATHWAY SCORE:** $\frac{LE \times T \times WC}{82,500}$ 0 (maximum of 100)

| SITE SCORE CALCULATION | S | $S^2$ |
|---|---|---|
| GROUND WATER PATHWAY SCORE ($S_{GW}$) | 2.43 | 5.9 |
| SURFACE WATER PATHWAY SCORE ($S_{SW}$) | 0.21 | 0.44 |
| SOIL EXPOSURE ($S_S$) | 0 | 0 |
| AIR PATHWAY SCORE ($S_A$) | 0 | 0 |
| SITE SCORE $\sqrt{\frac{S_{GW}^2+S_{SW}^2+S_S^2+S_A^2}{4}}$ = | | 2.5 |

COMMENTS

# Appendix C: Chain of Custody Forms and Laboratory Reports for Site Inspection Samples

GEORGIA ENVIRONMENTAL PROTECTION DIVISION
HAZARDOUS WASTE MANAGEMENT BRANCH

CHAIN OF CUSTODY

FACILITY: FORT VALLEY, GA LOCATION: FORMER MAIN STREET LAUNDRY

| SAMPLE # | HWMB LOG # | LAB # | DESCRIPTION | COLLECTED BY (NAME) | DATE | TIME |
|---|---|---|---|---|---|---|
| 3A | 7338 | | SITE 3 (HOTEL) 4' - SOIL | BRENT RABON | 10/27/97 | 11:03AM |
| 3B | 7339 | | SITE 3 (HOTEL) 10' - SOIL | BRENT RABON | 10/27/97 | 11:20AM |
| 1A | 7340 | | SITE 1 (DCUST) 8' - SOIL | BRENT RABON | 10/27/97 | 12:02PM |
| 1B | 7341 | | SITE 1 (DC UST) 12' - SOIL | BRENT RABON | 10/27/97 | 12:17PM |
| 4A | 7342 | | SITE 4 (ALLEY) 4' - SOIL | BRENT RABON | 10/27/97 | 4:25PM |
| 4B | 7343 | | SITE 4 (ALLEY) 8' - SOIL | BRENT RABON | 10/27/97 | 4:40PM |
| 5A | 7344 | | SITE 5 (RAILROAD BED) 5' - SOIL | BRENT RABON | 10/27/97 | 5:12PM |
| 2A | 7345 | | SITE 2 (UST) - 9' - SOIL | BRENT RABON | 10/28/97 | 9:15AM |

TRANSFER RECORD

| TRANSFERRED BY (NAME) | TO (NAME) (IF FINAL: LAB NAME) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (NAME) | DATE |
|---|---|---|---|---|---|---|
| BRENT RABON | Rec. Lab | 10/28/97 | 3:00PM | Hand | Robert Price | 10/28/97 |
| | | | | | | |
| | | | | | | |

ANALYSIS REQUESTED:

R:/Mitchell
Forms. Custody. FRM

**GEORGIA ENVIRONMENTAL PROTECTION DIVISION**
**HAZARDOUS WASTE MANAGEMENT BRANCH**

**CHAIN OF CUSTODY**

**FACILITY:** FORT VALLEY, GA **LOCATION:** FORMER MAIN STREET LAUNDRY

| SAMPLE # | HWMB LOG # | LAB # | DESCRIPTION | COLLECTED BY (NAME) | DATE | TIME |
|---|---|---|---|---|---|---|
| 2B | 7346 | | SITE 2 (UST) - 12' - SOIL | BRENT RABON | 9:32AM | 10/28/97 |
| 6A | 7347 | | SITE 6 (RAILROAD BED) - 3' SOIL | BRENT RABON | 10/28/97 | 10:50AM |
| 6B | 7348 | | SITE 6 (RAILROAD BED) - 8' SOIL | BRENT RABON | 10/28/97 | 11:02AM |
| 1C | 7349 | | SHALLOW WELL - GROUNDWATER | BRENT RABON | 10/28/97 | 12:08PM |
| EPD TRIP BLANK | 7358 | | EPD LAB TRIP BLANK | ~~[illegible]~~ | 10/22/97 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**TRANSFER RECORD**

| TRANSFERRED BY (NAME) | TO (NAME) (IF FINAL: LAB NAME) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (NAME) | DATE |
|---|---|---|---|---|---|---|
| BRENT RABON | Inorganic Lab | 10/28/97 | 3:00PM | Hand | Robert Price | 10/28/97 |
| | | | | | | |
| | | | | | | |

**ANALYSIS REQUESTED:**

R:/Mitchell

HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

SITE 3A

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY ST (AKA WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7338

***(File a separate Request Sheet for each sample point)***

**Analysis Needed By:** **Routine** ____ **Other (specify):** 3I INVESTIGATION

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Water | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Concentration of Organics Requested (if applicable): High ____ Low ____ Other (e.g., trace, pure, unknown) _____

Describe Sample including Source and Known Properties (e.g., pH, concentration):

SOIL CONTAMINATED HEAVILY WITH TETRACHLOROETHYLENE OR KEROSENE

Analysis Requested by: _____

Special Instructions: _____

AB34242

Date Submitted: 10/28/97

Sample Collected: [illegible]

## ANALYSIS

Note: Check will eliminate [illegible] will expedite analysis

### 1. TOTAL ORGANICS

| | | | |
|---|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ✓ | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Volatiles | ✓ | Mercury | ____ |
| Pesticides | ____ | Metals Special Request: | ____ |
| Herbicides | ____ | | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

2 4 OZ. JARS
1 8 OZ. JARS
1 16 OZ. JARS

Organics Special Request: _____

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: _____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | ____ | Date: | ____ | Received By (EPD Lab): | Robert Rice |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/28/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84242** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 11:03 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7338 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7338 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***'anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 44.1 | | ug/kg | SMA | 11/03/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 39.5 | | ug/kg | SMA | 11/03/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
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**Laboratory Contacts:**

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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | .-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Toluene | 34483 | 8260 | 5 | 6.2 | | ug/kg | SMA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 45.7 | | ug/kg | SMA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/03/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 53.4 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits


**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | .,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 66.7 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 61.9 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits


**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 69.3 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 66.6 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 72.5 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB) SITE 38

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY ST (AKA WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7339

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** SI INVESTIGATION

Sample Description (check one)

Water ____ Soil/Sediment ✓ Sludge ____

Ground Water ____ Surface Water ____ Drinking Water Well ____

Concentration of [illegible] (mg/kg): [illegible] Other (e.g. [illegible]): _____

Describe Sample Including Source and [illegible] (est. concentration):

SOIL CONTAMINATED [illegible] WITH [illegible] IN [illegible]

Applicable Hazardous Waste Codes: _____

Special Procedures: _____

[illegible]

Sample collector: [illegible]

## 1. TOTAL ORGANICS

Semi-Volatiles (Acid & Base/Neutral) ✓

Volatiles ✓

Pesticides ____

Herbicides ____

Organophosphorous Pesticides ____

PCB ____

BETX ____

Total Petroleum Hydrocarbon ____

Organics Special Request: _____

1 1 1 2

4 OZ JARS
8 OZ JARS
16 OZ JARS

ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____

Mercury ____

Metals Special Request: ____

## 3. TCLP ORGANICS

Volatiles ____ Pesticides ____

Semi-Volatiles (Acid & Base/Neutral) ____ Herbicides ____

Additional Specific Organics For TCLP: _____

## 4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ Additional Metals For TCLP: _____

Mercury ____

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back):

Reviewed By (HWMB): _____ Date: _____ Received By (EPD Lab): Robert Pui

Approved By (HWMB): _____ Date: _____ Date (EPD Lab): 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84243** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 11:20 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7339 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7339 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***C ·anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | ·,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



·RAMETER CODE: EPA
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| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.2 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.8 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |

**Sample ID : AB84243**



RAMETER CODE: EPA
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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.0 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 23.9 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 27.5 | LSPEC | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 24.6 | LSPEC | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
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MDL: method detection limit
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Trace: Below quantitation limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ,ideno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 27.7 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 24.6 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 35.5 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB) SITE 1A

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY ST (OKA WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RAGON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7340

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** SI INVESTIGATION

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Water | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Concentration of [illegible] (estimated): High ____ Low ____ Other (e.g., [illegible]) _____

Description of Sample Source And Known Properties (e.g., pH, concentration):

[illegible] CONTAMINATED SOIL WITH TRICHLOROETHYLENE OR KEROSENE

[illegible]

Special Precautions: _____

[illegible] FINAL [illegible]

[illegible]

Sample collector: RAGON/WIL[illegible]

1. TOTAL ORG[illegible]

| | | | |
|---|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ✓ | 1 | 4 OZ. JARS |
| Volatiles | ✓ | 1 | 8 OZ. JARS |
| Pesticides | ____ | 2 | 16 OZ. JARS |
| Herbicides | ____ | | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

Organics Special Request: _____

## 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: _____

## 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | ____ | Date: | ____ | Received By (EPD Lab): | Robert Price |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/28/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

**Sample Collector:** RABON/WILLIAMS **Sample ID :** **AB84244**
**Date Received:** 10/28/97 **Date Collected:** 10/27/97
**Time Received:** 16:58 **Time Collected:** 12:02
**Reporting Date:** 12/03/97 **DNR Lab Reference:** HW7340
**Sample Site:** FORT VALLEY SI SOIL HW7340

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.0 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.0 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | 15.4 | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.0 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 54.8 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



PARAMETER CODE: EPA
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MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 62.0 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 60.3 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 68.9 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 65.7 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 68.4 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

SITE 1B

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY SI (FORMER MAIN STREET LAUNDRY) (aka WINONA HOTEL PRESSING CLUB)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7341

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** SI INVESTIGATION

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| [illegible] | ____ | Soil/Sediment | ✓ | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Concentration of Organics (estimated): High ____ Low ____ Other (e.g., [illegible]): ____

Describe Sample including Odors and Known Properties (e.g., pH, concentration):

[illegible] TRICHLOROETHYLENE [illegible]

Applicable [illegible]

Special [illegible]

Note: [illegible]

1. TOTAL ORGANICS

| | |
|---|---|
| Semi-volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

Organics Special Request: _____

1 1 2
4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Be, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: _____

4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Be, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

**Reviewed By (HWMB):** _____ **Date:** _____ **Received By (EPD Lab):** Robert Price

**Approved By (HWMB):** _____ **Date:** _____ **Date (EPD Lab):** 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84245** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 12:17 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7341 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7341 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.2 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.3 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



PARAMETER CODE: EPA
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mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | ,-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.1 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 65.5 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 76.4 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 70.6 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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**Laboratory Contacts:**

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|---|---|---|
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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | .enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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**Laboratory Contacts:**

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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 82.4 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 78.1 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 81.0 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

SITE 4A

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY ST (aka WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7342

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** 3T INVESTIGATION

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Concentration of Organics: High ____ Low ____ Other (e.g., mixed phase - specify) _____

Describe Sample Including Odors and Known Properties (e.g., pH, concentration):

TRICHLOROETHYLENE OR KEROSENE

Additional Comments: Codes ____

[illegible] 8342-6

[illegible] FORT VALLEY ST

[illegible] BOTTOM: B. RABON / E. WILLIAMS

## 1. ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ✓ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

1 1 2

4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

## 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

Organics Special Request: _____

## 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: _____

## 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | ____ | Date: | ____ | Received By (EPD Lab): | Robert Price |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/28/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84246** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 16:25 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7342 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7342 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 44.7 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 49.6 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | 6.19 | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.5 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 65.0 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 77.7 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 66.9 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 79.7 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 79.0 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 81.8 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB) SITE 4B

REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY ST (aka WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7343

***(File a separate Request Sheet for each sample point)***

**Analysis Needed By:** **Routine** ____ **Other (specify):** ST INVESTIGATION

Sample Description (check one)

[illegible] ____ Soil/Sediment ____ Sludge ____

[illegible] ____ Surface Water ____ Drinking Water Well ____

Concentrate [illegible] ____ Other (e.g., mine drain) ____

Describe Sample Including [illegible] pH, concentration):

[illegible]

Additional [illegible]

Special [illegible]

[illegible]

1. TOTAL [illegible]

Sample Collector [illegible]

| | | | |
|---|---|---|---|
| Semi [illegible] (Acid & Base/Neutral) | ____ | | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ |
| Volatiles | ✓ | 2 | Mercury ____ |
| Pesticides | ____ | 1 | Metals Special Request: ____ |
| Herbicides | ____ | 1 | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

Organics Special Request: _____

## 3. TCLP ORGANICS

Volatiles ____ Pesticides ____

Semi-Volatiles (Acid & Base/Neutral) ____ Herbicides ____

Additional Specific Organics For TCLP: _____

## 4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ Additional Metals For TCLP: _____

Mercury ____

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

**Reviewed By (HWMB):** _____ **Date:** _____ **Received By (EPD Lab):** Robert Price

**Approved By (HWMB):** _____ **Date:** _____ **Date (EPD Lab):** 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84247** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 16:40 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7343 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7343 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | .2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | .,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 44.8 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ırbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.3 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | lethylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | .-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.6 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 65.9 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 77.0 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 73.2 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | lexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 82.2 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 81.0 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 84.3 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
REQUEST FOR LABORATORY ANALYSIS

SITE 5 X GHL

**Facility Name/Location:** FORT VALLEY ST (AKA WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7344

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** 3T INVESTIGATION

Sample Description (check one)

Water ____ Soil/Sediment X Sludge ____

Ground Water ____ Surface Water ____ Drinking Water Well ____

Concentration of Pollutants Expected (estimated): High ____ Low ____ Other (e.g., rinse blank, etc.) ____

Describe Sample Including Source and Known Properties (e.g., pH, concentration):

SLUDGE CONTAINING NAPHTHALENE AND TETRACHLOROETHYLENE IN KOOL SEAL

ONLY

ABC2045

Sample collected by E. WILLIAMS

1. TOTAL ORGANICS

Semi-Volatiles (Acid & Base/Neutral) ✓

Volatiles ✓

Pesticides ____

Herbicides ____

Organophosphorous Pesticides ____

PCB ____

BETX ____

Total Petroleum Hydrocarbon ____

Organics Special Request: _____

2 4 OZ. JARS
1 8 OZ. JARS
1 16 OZ. JARS

ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____

Mercury ____

Metals Special Request: ____

3. TCLP ORGANICS

Volatiles ____ Pesticides ____

Semi-Volatiles (Acid & Base/Neutral) ____ Herbicides ____

Additional Specific Organics For TCLP: _____

4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ Additional Metals For TCLP: _____

Mercury ____

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

Reviewed By (HWMB): _____ Date: _____ Received By (EPD Lab): Robert Rice

Approved By (HWMB): _____ Date: _____ Date (EPD Lab): 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84248** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 17:12 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7344 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7344 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ',2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 43.8 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ırbon Disulfide | 78544 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.1 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1ethylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | 7.93 | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 48.1 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 54.4 | | ug/kg | LSN | 11/21/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ',6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 70.2 | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 59.1 | | ug/kg | LSN | 11/21/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Trace | | ug/kg | LSN | 11/21/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 9,10-Anthracedione | | 8270a | -0- | 1881 TIE | | ug/kg | LSN | 11/21/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]anthracene | 34529 | 8270a | 660 | 1665 | | ug/kg | LSN | 11/21/97 |
| | enzo[a]pyrene | 34250 | 8270a | 660 | 2063 | | ug/kg | LSN | 11/21/97 |
| | Benzo[b]fluoranthene | 34233 | 8270a | 660 | 2653 | | ug/kg | LSN | 11/21/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | 1772 | | ug/kg | LSN | 11/21/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | 1944 | | ug/kg | LSN | 11/21/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chyrsene | 34323 | 8270a | 660 | 3404 | | ug/kg | LSN | 11/21/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dimethylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Fluoranthene | 34379 | 8270a | 660 | 6176 | | ug/kg | LSN | 11/21/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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**Laboratory Contacts:**

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|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Indeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | 1943 | | ug/kg | LSN | 11/21/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Naphthalene | 34445 | 8270a | 660 | Trace | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 75.5 | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenanthrene | 34464 | 8270a | 660 | 6108 | | ug/kg | LSN | 11/21/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 74.2 | | ug/kg | LSN | 11/21/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pyrene | 34472 | 8270a | 660 | 6880 | | ug/kg | LSN | 11/21/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Substituted Phenanthrene | | 8270a | -0- | 896 TIE | | ug/kg | LSN | 11/21/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 73.0 | | ug/kg | LSN | 11/21/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
REQUEST FOR LABORATORY ANALYSIS

SITE 2A

GHL

**Facility Name/Location:** FORT VALLEY ST (OKA WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/28/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7345

*(File a separate Reqest Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** SI INVESTIGATION

Sample Description (check one)

Soil/Sediment ____ Sludge ____ Surface Water ____ Drinking Water Well ____

Other (e.g., trace blank, spike) ____

[illegible]

1. TOTAL [illegible]

Sample collection [illegible]

| | | | |
|---|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | |
| Volatiles | ✓ | Mercury | |
| Pesticides | | Metals Special Request: | |
| Herbicides | | | |
| Organophosphorous Pesticides | | | |
| PCB | | | |
| BETX | | | |
| Total Petroleum Hydrocarbon | | | |

2 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

Organics Special Request: _____

3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | | Pesticides | |
| Semi-Volatiles (Acid & Base/Neutral) | | Herbicides | |

Additional Specific Organics For TCLP: _____

4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | | Additional Metals For TCLP: | |
| Mercury | | | |

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

**Reviewed By (HWMB):** _____ **Date:** _____ **Received By (EPD Lab):** Robert Price

**Approved By (HWMB):** _____ **Date:** _____ **Date (EPD Lab):** 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

**Sample Collector:** RABON/WILLIAMS **Sample ID :** **AB84249**
**Date Received:** 10/28/97 **Date Collected:** 10/28/97
**Time Received:** 16:58 **Time Collected:** 09:15
**Reporting Date:** 12/03/97 **DNR Lab Reference:** HW7345
**Sample Site:** FORT VALLEY SI SOIL HW7345

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.4 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 51.3 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.6 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 9.28 | LSPEC | ug/kg | LSN | 11/21/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 75.3 | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 17.9 | LSPEC | ug/kg | LSN | 11/21/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
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Trace: Below quantitation limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 79.2 | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 47.3 | | ug/kg | LSN | 11/21/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 81.0 | | ug/kg | LSN | 11/21/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB) SITE 2 B

# REQUEST FOR LABORATORY ANALYSIS

**Facility Name/Location:** FORT VALLEY ST (AKA WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/28/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7346

*(File a separate Reqest Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** 3I INVESTIGATION

Sample Description (check one)

Air ____ Soil/Sediment X Sludge ____

Ground Water ____ Surface Water ____ Drinking Water Well ____

Concentration of Chemical [illegible] High ____ Low ____ Other (e.g., [illegible] specify) _____

Reason Sample Taken, Source And Known Properties (e.g., pH, concentration): [illegible] TRACHLOROETHYLENE [illegible]

ANALYSIS

[illegible]

sample collector: RABON/WILLIAMS

| | | | | |
|---|---|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ✓ | 4 OZ. JARS | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Volatiles | ✓ | 8 OZ. JARS | Mercury | ____ |
| Pesticides | ____ | 16 OZ. JARS | Metals Special Request: | ____ |
| Herbicides | ____ | | | |
| Organophosphorous Pesticides | ____ | | | |
| PCB | ____ | | | |
| BETX | ____ | | | |
| Total Petroleum Hydrocarbon | ____ | | | |

**Organics Special Request:** _____

## 3. TCLP ORGANICS

Volatiles ____ Pesticides ____

Semi-Volatiles (Acid & Base/Neutral) ____ Herbicides ____

Additional Specific Organics For TCLP: _____

## 4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ Additional Metals For TCLP: _____

Mercury ____

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

**Reviewed By (HWMB):** _____ **Date:** _____ **Received By (EPD Lab):** Robert Price

**Approved By (HWMB):** _____ **Date:** _____ **Date (EPD Lab):** 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84250** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 09:32 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7346 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7346 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***·anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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**Laboratory Contacts:**

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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.2 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ırbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.3 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.3 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 59.2 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ..,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 66.5 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 63.4 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
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|---|---|---|
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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | :methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ideno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | N-Butyl-Benzenesulfonamide | | 8270a | -0- | 9796 TIE | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 69.7 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ienacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 65.5 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 72.2 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

SITE 6A

G2

# REQUEST FOR LABORATORY ANALYSIS

(aka WINONA HOTEL PRESSING CLUB)

**Facility Name/Location:** FORT VALLEY SI (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/28/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7347

***(File a separate Request Sheet for each sample point)***

**Analysis Needed By:** **Routine** ____ **Other (specify):** SI INVESTIGATION

Sample [illegible]

[illegible] ____ Sediment ____ Sludge ____

[illegible] ____ Surface Water ____ Drinking Water Well ____

[illegible] High ____ Low ____ [illegible] (e.g., rinse blank - [illegible]) _____

Describe S[illegible] Known Hazards [illegible]:

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. TC[illegible] [illegible] collector, [illegible]

| | | | |
|---|---|---|---|
| Soil (Acid & Base/Neutral) | ____ | | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ |
| Volatiles | ✓ | 4 OZ. JARS | Mercury ____ |
| Pesticides | ____ | 8 OZ. JARS | Metals Special Request: ____ |
| Herbicides | ____ | 16 OZ. JARS | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

**Organics Special Request:** _____

## 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

**Additional Specific Organics For TCLP:** _____

## 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

**Reviewed By (HWMB):** _____ **Date:** _____ **Received By (EPD Lab):** Robert Rice

**Approved By (HWMB):** _____ **Date:** _____ **Date (EPD Lab):** 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84251** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 10:50 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7347 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7347 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 43.2 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 53.9 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | .-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.8 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 44.2 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | .,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 24.7 | LSPEC | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 2.15 | LSPEC | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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**Laboratory Contacts:**

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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ydrocarbon Compounds | | 8270a | -0- | 2937 TIE | | ug/kg | LSN | 11/20/97 |
| | Indeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 7.65 | LSPEC | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 5.13 | LSPEC | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 70.2 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

REQUEST FOR LABORATORY ANALYSIS

SITE 6B

GHL

**Facility Name/Location:** FORT VALLEY ST (AKA WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/28/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7348

***(File a separate Request Sheet for each sample point)***

**Analysis Needed By:** **Routine** ____ **Other (specify):** SI INVESTIGATION

[illegible] condition (check one)

| | | | | | |
|---|---|---|---|---|---|
| [illegible] | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

[illegible] ____ [illegible] ____ Other [illegible] ____

Describe sample including source And Known Properties (e.g., ph, concentration):

[illegible] TRICHLOROETHYLENE IN KERO[illegible]

[illegible]

[illegible]

A56425[illegible]

[illegible]

1. TOTAL ORGANICS

Sample collector: RABON/WILLIAMS

| | | | |
|---|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ✓ | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Volatiles | ✓ | Mercury | ____ |
| Pesticides | ____ | Metals Special Request: | ____ |
| Herbicides | ____ | | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

2 — 4 OZ. JARS
— 8 OZ. JARS
— 16 OZ. JARS

**Organics Special Request:** _____

3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

**Additional Specific Organics For TCLP:** _____

4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | ____ | Date: | ____ | Received By (EPD Lab): | Robert Price |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/28/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84252** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 11:02 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7348 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7348 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | 141 | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.9 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 51.0 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.9 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 54.8 | | ug/kg | LSN | 11/21/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 59.5 | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 56.4 | | ug/kg | LSN | 11/21/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ,ydrocarbon Compounds | | 8270a | -0- | 809 TIE | | ug/kg | LSN | 11/21/97 |
| | Indeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 61.7 | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ıenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 61.5 | | ug/kg | LSN | 11/21/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 74.8 | | ug/kg | LSN | 11/21/97 |

**Sample comments :**

*End of Report*



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# HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
## REQUEST FOR LABORATORY ANALYSIS

EXISTING MW GW

**Facility Name/Location:** FORT VALLEY SI (FORMER MAIN STREET LAUNDRY) aka WINONA HOTEL PRESS CLUB

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS 404/656-2833

**Collection Date:** 10/28/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7349

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** Routine ____ Other (specify): SI INVESTIGATION

[illegible]

Sludge ____

[illegible] ____ [illegible] ____ [illegible] ____

Concentration [illegible] ____ Other (please [illegible]) ____

Describe [illegible] Source [illegible] (e.g. pH, concentration):

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. TOTAL ORGANICS

Sample [illegible] RAB [illegible]

| | | | |
|---|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Volatiles | ✓ | Mercury | ____ |
| Pesticides | ____ | Metals Special Request: | ____ |
| Herbicides | ____ | | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

Sample [illegible] HALF GALLONS/CYANIDE
NUTRIENTS/SULFATES
FCOL BOTTLES
METAL BOTTLES
AMBER BOTTLES
VOC VIALS
SULFIDES/PHENOLS
OIL AND GREASE

Organics Special Request: _____

3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: _____

4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

**Reviewed By (HWMB):** _____ **Date:** _____ **Received By (EPD Lab):** Robert Pre

**Approved By (HWMB):** _____ **Date:** _____ **Date (EPD Lab):** 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84253** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 12:08 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7349 |
| **Sample Site:** | FORT VALLEY SI WATER HW7349 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Water*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | 77562 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34506 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34516 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34511 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1-Dichloroethane | 34496 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1-Dichloroethene | 34501 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/L | JDA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2,3-Trichloropropane | 77443 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34551 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 77222 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2-Dibromoethane | 77651 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34536 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2-Dichloroethane | 32103 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34541 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34566 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34571 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 2-Butanone | 81595 | 8260 | 100 | Not detected | | ug/L | JDA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34576 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 2-Chlorotoluene | 77275 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 2-Hexanone | 77103 | 8260 | 50 | Not detected | | ug/L | JDA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 81596 | 8260 | 50 | Not Detected | | ug/L | JDA | 11/03/97 |
| | Acetone | 81552 | 8260 | 100 | Not detected | | ug/L | JDA | 11/03/97 |
| | Benzene | 34030 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Bromobenzene | 81555 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Bromodichloromethane | 32101 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 43.5 | | ug/L | JDA | 11/03/97 |
| | Bromoform | 32104 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Bromomethane | 34413 | 8260 | 10 | Not detected | | ug/L | JDA | 11/03/97 |
| | arbon Disulfide | 77041 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Carbon Tetrachloride | 32102 | 8260 | 5 | Not Detected | | ug/L | JDA | 11/03/97 |
| | Chlorobenzene | 34301 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Chloroethane | 34311 | 8260 | 10 | Not detected | | ug/L | JDA | 11/03/97 |
| | Chloroform | 32106 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Chloromethane | 34418 | 8260 | 10 | Not detected | | ug/L | JDA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34704 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Dibromochloromethane | 32105 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.4 | | ug/L | JDA | 11/03/97 |
| | Dibromomethane | 77596 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Dichlorodifluoromethane | 34668 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Ethylbenzene | 34371 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Hexachlorobutadiene | 38702 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Iodomethane | 77424 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34423 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Naphthalene | 34696 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | o-Xylene | 77135 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | p,m-Xylene | 77135 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Styrene | 77128 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Tetrachloroethene | 34475 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Toluene | 34010 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 49.0 | | ug/L | JDA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34546 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34699 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Trichloroethene | 39180 | 8260 | 5 | Not Detected | | ug/L | JDA | 11/03/97 |
| | Trichlorofluoromethane | 34488 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Vinyl Acetate | 77057 | 8260 | 50 | Not detected | | ug/L | JDA | 11/03/97 |
| | Vinyl Chloride | 39175 | 8260 | 2 | Not detected | | ug/L | JDA | 11/03/97 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
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MDL: method detection limit
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**Laboratory Contacts:**

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|---|---|---|
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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
## REQUEST FOR LABORATORY ANALYSIS

**Facility Name/Location:** FORT VALLEY ST (Former Main Street Laundry) aka Winona Hotel Press Club

**Sample Collected By/Phone:** B RABON / E. WILLIAMS 404/656-2833

**Collection Date:** 10/22/97

**Date Submitted To Lab:** 10/28/97

**HWMB LOG NUMBER:** 7350

*(File a separate Reqest Sheet for each sample point)*

**LAB No.** EPD TRIP BLANK

Analysis Needed By: Routine ____ Other (sp Georgia Dept. of Natural Resources

Soil Sedi

Water ____ Source

Approximate Amount of Contaminant Requested (estimated): High ____ L

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Collector: RABON/W

REQUIRED

(Note: Totals will have to be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |
| Organics Special Request: | |

| | |
|---|---|
| OIL AND GREASE | ____ |
| SULFIDES/PHENOLS | ____ |
| VOC VIALS | ✓ |
| AMBER BOTTLES | ____ |
| METAL BOTTLES | ____ |
| FCOL BOTTLES | ____ |
| NUTRIENTS/SULFATES | ____ |
| HALF GALLONS/CYANIDE | ____ |

2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: ____

4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ____

Reviewed By (HWMB): ____ Date: ____ Received By (EPD Lab): ____

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84254** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/22/97 |
| **Time Received:** | 16:58 | **Time Collected:** | -0- |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7350 |
| **Sample Site:** | FORT VALLEY SI TRL BLK HW7350 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Water*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | 77562 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1,1-Trichloroethane | 34506 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1,2,2-Tetrachloroethane | 34516 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1,2-Trichloroethane | 34511 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1-Dichloroethane | 34496 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1-Dichloroethene | 34501 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2,3-Trichloropropane | 77443 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2,4-Trichlorobenzene | 34551 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2,4-Trimethylbenzene | 77222 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2-Dibromoethane | 77651 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2-Dichlorobenzene | 34536 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2-Dichloroethane | 32103 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34541 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,3-Dichlorobenzene | 34566 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,4-Dichlorobenzene | 34571 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 2-Butanone | 81595 | 8260 | 100 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 2-Chloroethyl vinyl ether | 34576 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 2-Chlorotoluene | 77275 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 2-Hexanone | 77103 | 8260 | 50 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 4-Methyl-2-Pentanone | 81596 | 8260 | 50 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Acetone | 81552 | 8260 | 100 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Benzene | 34030 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Bromobenzene | 81555 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Bromodichloromethane | 32101 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | 0 | 47.0 | | ug/L | SMA | 10/29/97 |
| | Bromoform | 32104 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Bromomethane | 34413 | 8260 | 10 | Not Detected | | ug/L | SMA | 10/29/97 |
| | ırbon Disulfide | 77041 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Carbon Tetrachloride | 32102 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Chlorobenzene | 34301 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Chloroethane | 34311 | 8260 | 10 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Chloroform | 32106 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Chloromethane | 34418 | 8260 | 10 | Not Detected | | ug/L | SMA | 10/29/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | cis-1,3-Dichloropropene | 34704 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Dibromochloromethane | 32105 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | 0 | 51.5 | | ug/L | SMA | 10/29/97 |
| | Dibromomethane | 77596 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Dichlorodifluoromethane | 34668 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Ethylbenzene | 34371 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Hexachlorobutadiene | 38702 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Iodomethane | 77424 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
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**Laboratory Contacts:**

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|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34423 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | .-Butylbenzene | 77342 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Naphthalene | 34696 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | o-Xylene | 77135 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | p,m-Xylene | 77135 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Styrene | 77128 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Tetrachloroethene | 34475 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Toluene | 34010 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | 0 | 48.0 | | ug/L | SMA | 10/29/97 |
| | trans-1,2-Dichloroethene | 34546 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | trans-1,3-Dichloropropene | 34699 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Trichloroethene | 39180 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Trichlorofluoromethane | 34488 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Vinyl Acetate | 77057 | 8260 | 50 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Vinyl Chloride | 39175 | 8260 | 2 | Not Detected | | ug/L | SMA | 10/29/97 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
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LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# Appendix D: Frost Associates CENTRACTS Report

# FROST ASSOCIATES

88 Founders Village, Clinton, CT 06426
(860) 669-5859 FAX (860) 669-5859


December 4, 1997

To: Environmental Protection Division
205 Butler St., Floyd Towers East, Suite 1154
Atlanta, GA 30334

Attn: James Ussery

Fr: Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Former Dry Cleaners, Main Street
Fort Valley, GA

CERCLIS:

Job: 2097

ite Longitude: 83-53-10 83.886108
Site Latitude : 32-33-10.1 32.552811

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. A CENTRACTS report may have up to six radii of any length and 1500 block groups.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from The Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, 88 Founders Village, Clinton Conn 06413. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ing are retained. All Block Group boundary lines matching the Block Group numbers .re then extracted from the respective county files to obtain all sides of the included Block Groups. Boundary records are then sorted in adjacent side order to determine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adjacent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)}

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 population and house count extracted from the Census Bureau's 1990 STF-1A files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

Former Dry Cleaners, Main Street
Fort Valley, GA

| No. | City | Block Group ID | Blk Grp People | House Holds | Public Water | Drilled Wells | Dug Wells | Other |
|---|---|---|---|---|---|---|---|---|
| 1 | Zenith | 13079 0702 3 | 1021 | 358 | 35 | 298 | 42 | 0 |
| 2 | Marshallville | 13193 9801 1 | 889 | 327 | 245 | 66 | 28 | 0 |
| 3 | Marshallville | 13193 9801 2 | 1119 | 369 | 303 | 44 | 24 | 0 |
| 4 | Fort Valley | 13225 0402 1 | 1930 | 718 | 453 | 194 | 19 | 0 |
| 5 | Fort Valley | 13225 0402 2 | 1842 | 600 | 476 | 85 | 23 | 10 |
| 6 | Fort Valley | 13225 0404 1 | 4415 | 1258 | 1275 | 36 | 0 | 0 |
| 7 | Fort Valley | 13225 0404 2 | 1160 | 456 | 435 | 28 | 0 | 0 |
| 8 | Fort Valley | 13225 0404 3 | 132 | 49 | 4 | 24 | 4 | 0 |
| 9 | Fort Valley | 13225 0403011 | 2434 | 888 | 744 | 100 | 52 | 0 |
| 10 | Fort Valley | 13225 0403012 | 267 | 136 | 122 | 0 | 0 | 0 |
| 11 | Fort Valley | 13225 0403013 | 74 | 25 | 11 | 16 | 0 | 0 |
| 12 | Fort Valley | 13225 0403021 | 1773 | 728 | 702 | 45 | 0 | 0 |
| | Totals: | | 17056 | 5912 | 4805 | 936 | 192 | 10 |

Former Dry Cleaners, Main Street
Fort Valley, GA

| City | Census Tract ID | Tract People | House Count | Public Water | Drilled Wells | Dug Wells | Other Sources |
|---|---|---|---|---|---|---|---|
| Fort Valley | 13225 0404 2 | 1160 | 456 | 435 | 28 | 0 | 0 |
| Fort Valley | 13225 0404 3 | 132 | 49 | 4 | 24 | 4 | 0 |
| Fort Valley | 13225 0403011 | 2434 | 888 | 744 | 100 | 52 | 0 |
| Fort Valley | 13225 0402 1 | 1930 | 718 | 453 | 194 | 19 | 0 |
| Fort Valley | 13225 0402 2 | 1842 | 600 | 476 | 85 | 23 | 10 |
| Fort Valley | 13225 0404 1 | 4415 | 1258 | 1275 | 36 | 0 | 0 |
| Fort Valley | 13225 0403012 | 267 | 136 | 122 | 0 | 0 | 0 |
| Fort Valley | 13225 0403013 | 74 | 25 | 11 | 16 | 0 | 0 |
| Fort Valley | 13225 0403021 | 1773 | 728 | 702 | 45 | 0 | 0 |
| | Sub Totals: | 14027 | 4858 | 4222 | 528 | 98 | 10 |
| Marshallville | 13193 9801 1 | 889 | 327 | 245 | 66 | 28 | 0 |
| Marshallville | 13193 9801 2 | 1119 | 369 | 303 | 44 | 24 | 0 |
| | Sub Totals: | 2008 | 696 | 548 | 110 | 52 | 0 |
| Zenith | 13079 0702 3 | 1021 | 358 | 35 | 298 | 42 | 0 |
| | Sub Totals: | 1021 | 358 | 35 | 298 | 42 | 0 |

Former Dry Cleaners, Main Street
Fort Valley, GA

For Radius of 4 Mi., Circle Area = 50.265482

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 1 | Zenith | 13079 7023 | 54.973682 | 4.377020 | 7.96 |
| 2 | Marshallville | 13193 98011 | 32.482178 | 0.026894 | 0.08 |
| 3 | Marshallville | 13193 98012 | 44.204029 | 0.180903 | 0.41 |
| 4 | Fort Valley | 13225 4021 | 23.838772 | 9.576304 | 40.17 |
| 5 | Fort Valley | 13225 403021 | 15.109363 | 6.476526 | 42.86 |
| 6 | Fort Valley | 13225 4041 | 7.808100 | 6.960451 | 89.14 |
| 7 | Fort Valley | 13225 4042 | 3.236856 | 2.437718 | 75.31 |
| 8 | Fort Valley | 13225 4043 | 10.538695 | 0.842555 | 7.99 |
| 9 | Fort Valley | 13225 403011 | 11.290095 | 10.296000 | 91.19 |
| 10 | Fort Valley | 13225 403012 | 0.132095 | 0.132095 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533351 | 0.533351 | 100.00 |
| 12 | Fort Valley | 13225 4022 | 25.240095 | 8.425662 | 33.38 |
| | Totals: | | 229.387329 | 50.265484 | |

For Radius of 3 Mi., Circle Area = 28.274334

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838772 | 4.944086 | 20.74 |
| 5 | Fort Valley | 13225 403021 | 15.109363 | 3.882128 | 25.69 |
| 6 | Fort Valley | 13225 4041 | 7.808100 | 4.723987 | 60.50 |
| 7 | Fort Valley | 13225 4042 | 3.236856 | 1.140872 | 35.25 |
| 8 | Fort Valley | 13225 4043 | 10.538695 | 0.071575 | 0.68 |
| 9 | Fort Valley | 13225 403011 | 11.290095 | 7.552831 | 66.90 |
| 10 | Fort Valley | 13225 403012 | 0.132095 | 0.132095 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533351 | 0.533351 | 100.00 |
| 12 | Fort Valley | 13225 4022 | 25.240095 | 5.293409 | 20.97 |
| | Totals: | | 97.727417 | 28.274334 | |

For Radius of 2 Mi., Circle Area = 12.566371

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838772 | 2.047112 | 8.59 |
| 5 | Fort Valley | 13225 403021 | 15.109363 | 2.028956 | 13.43 |
| 6 | Fort Valley | 13225 4041 | 7.808100 | 2.427620 | 31.09 |
| 7 | Fort Valley | 13225 4042 | 3.236856 | 0.230478 | 7.12 |
| 9 | Fort Valley | 13225 403011 | 11.290095 | 3.092366 | 27.39 |
| 10 | Fort Valley | 13225 403012 | 0.132095 | 0.132095 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533351 | 0.150474 | 28.21 |
| 12 | Fort Valley | 13225 4022 | 25.240095 | 2.457268 | 9.74 |
| | Totals: | | 87.188728 | 12.566371 | |

Former Dry Cleaners, Main Street
Fort Valley, GA

For Radius of 1 Mi., Circle Area = 3.141593

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838772 | 0.566360 | 2.38 |
| 5 | Fort Valley | 13225 403021 | 15.109363 | 0.650179 | 4.30 |
| 6 | Fort Valley | 13225 4041 | 7.808100 | 0.681825 | 8.73 |
| 9 | Fort Valley | 13225 403011 | 11.290095 | 0.378614 | 3.35 |
| 10 | Fort Valley | 13225 403012 | 0.132095 | 0.126229 | 95.56 |
| 12 | Fort Valley | 13225 4022 | 25.240095 | 0.738386 | 2.93 |
| | Totals: | | 83.418518 | 3.141593 | |

For Radius of .5 Mi., Circle Area = 0.785398

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838772 | 0.171708 | 0.72 |
| 5 | Fort Valley | 13225 403021 | 15.109363 | 0.156088 | 1.03 |
| 6 | Fort Valley | 13225 4041 | 7.808100 | 0.170746 | 2.19 |
| 9 | Fort Valley | 13225 403011 | 11.290095 | 0.003341 | 0.03 |
| 12 | Fort Valley | 13225 4022 | 25.240095 | 0.283515 | 1.12 |
| | Totals: | | 83.286423 | 0.785398 | |

For Radius of .25 Mi., Circle Area = 0.196350

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838772 | 0.011230 | 0.05 |
| 5 | Fort Valley | 13225 403021 | 15.109363 | 0.006829 | 0.05 |
| 6 | Fort Valley | 13225 4041 | 7.808100 | 0.039840 | 0.51 |
| 12 | Fort Valley | 13225 4022 | 25.240095 | 0.138451 | 0.55 |
| | Totals: | | 71.996330 | 0.196350 | |

Former Dry Cleaners, Main Street
Fort Valley, GA

========== Site Data ==========

| | |
|---|---|
| Population: | 9617.35 |
| Households: | 3270.64 |
| Drilled Wells: | 311.85 |
| Dug Wells: | 66.52 |
| Other Water Sources: | 3.34 |

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

| | |
|---|---|
| Population: | 3325.05 |
| Households: | 1131.63 |
| Drilled Wells: | 127.52 |
| Dug Wells: | 22.94 |
| Other Water Sources: | 1.24 |

** Population On Private Wells: 442.08

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

| | |
|---|---|
| Population: | 3299.33 |
| Households: | 1111.30 |
| Drilled Wells: | 108.27 |
| Dug Wells: | 25.46 |
| Other Water Sources: | 1.12 |

** Population On Private Wells: 397.03

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

| | |
|---|---|
| Population: | 2094.64 |
| Households: | 692.17 |
| Drilled Wells: | 60.54 |
| Dug Wells: | 15.25 |
| Other Water Sources: | 0.68 |

** Population On Private Wells: 229.34

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

| | |
|---|---|
| Population: | 748.16 |
| Households: | 288.32 |
| Drilled Wells: | 11.90 |
| Dug Wells: | 2.46 |
| Other Water Sources: | 0.18 |

** Population On Private Wells: 37.24

Former Dry Cleaners, Main Street
Fort Valley, GA

---- Within Ring: .5 Mile(s) and .25 Mile(s) ----

| | |
|---|---|
| Population: | 115.83 |
| Households: | 36.83 |
| Drilled Wells: | 2.87 |
| Dug Wells: | 0.28 |
| Other Water Sources: | 0.06 |

** Population On Private Wells: 9.90

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

| | |
|---|---|
| Population: | 34.34 |
| Households: | 10.38 |
| Drilled Wells: | 0.76 |
| Dug Wells: | 0.14 |
| Other Water Sources: | 0.05 |

** Population On Private Wells: 2.97

# Appendix E: Site Inspection Sampling Plan

# SITE INSPECTION WORK PLAN

**FORMER DRY CLEANERS - MAIN STREET**
**(HEREAFTER REFERRED TO AS THE FORMER**
**WINONA HOTEL PRESSING CLUB)**
**FORT VALLEY, PEACH COUNTY, GEORGIA**
**EPA ID # GA0001974948**

**PREPARED FOR:**

**U.S. ENVIRONMENTAL PROTECTION AGENCY REGION IV**
**ATLANTA FEDERAL BUILDING**
**61 FORSYTH STREET, SW**
**ATLANTA, GEORGIA 30303-3415**

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**SEPTEMBER 1997**

## TABLE OF CONTENTS


1.0 INTRODUCTION . . . . . 1

2.0 SITE DESCRIPTION AND HISTORY . . . . . 1

2.1 Location . . . . . 1
2.2 Site Description . . . . . 1
2.3 Operational History and Waste Characteristics . . . . . 4

3.0 SAMPLING ACTIVITIES . . . . . 4

3.1 Surface Water Sampling . . . . . 6
3.2 Sediment Sampling . . . . . 6
3.3 Groundwater Sampling . . . . . 6
3.4 Soil Sampling . . . . . 7
3.5 Groundwater and Soil Sampling to determine Background . . . . . 7
3.6 Quality Assurance . . . . . 7
3.7 Field Activities . . . . . 9
3.8 Quality Control Procedures . . . . . 9

4.0 INVESTIGATORY DERIVED WASTE . . . . . 9

5.0 PROJECT MANAGEMENT . . . . . 9

5.1 Health and Safety . . . . . 10
5.2 Project Schedule . . . . . 10

6.0 REFERENCES . . . . . 11

## LIST OF FIGURES

Figure 2.1 U.S. Geological Survey 7.5 Minute Series Topographic Map of the Former Winona Hotel Pressing Club Site . . . . . 2

Figure 2.2 Former Winona Hotel Pressing Club Location on a Fort Valley City Map . . . 3

Figure 2.3 Preferential Drainage Pathway from Former Winona Hotel Pressing Club . . . 5

Figure 3.1 Sampling Locations at the Former Winona Hotel Pressing Club . . . . . 8

# 1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Hazardous Waste Management Branch of the Georgia Environmental Protection Division (GA EPD) will conduct a Site Inspection (SI) at the site known as the Former Dry Cleaners, Main Street, hereinafter known as the Former Winona Hotel Pressing Club (FWHPC), located in the City of Fort Valley, Peach County, Georgia. The SI will investigate the pathways of potential releases that may threaten human health and the environment as identified in the Summary Preliminary Assessment dated June 3, 1997 (Reference 1).

The scope of the investigation will include collecting soil and groundwater samples from the location of the Former Winona Hotel Pressing Club Underground Storage Tank (UST) and at locations along a former preferential drainage surface water pathway, associated with operations from the FWHPC. In addition, EPD's Georgia Geologic Survey Branch (GGS) will be conducting a Phase I investigation in the City of Fort Valley to assist in determining the source(s) that have contaminated the City of Fort Valley's Municipal Water Supply (FVMS) Wells Nos. 1 and 2. Groundwater analytical results, obtained from permanent monitoring wells installed by the GGS will be used to evaluate the presence or absence of contamination on the southwestern side of Municipal Well #1. Additional groundwater sampling will be conducted on a monitoring well, approximately 25 feet deep, that is located between the FVMS Well No. 1 and the FWHPC site to determine if operations at FWHPC may have caused the contamination in Well No. 1.

# 2.0 SITE DESCRIPTION AND HISTORY

## 2.1 Location

The Former Winona Hotel Pressing Club was located in what is now an alley between the McLean Water Plant and Main Street at a location approximately 50 feet northwest of Fort Valley Municipal Well 1. The geographic coordinates are latitude 32°33'10.1" North and longitude 83°53'10.0" West (Reference 1; Also See Figure 2.1).

## 2.2 Site Description

The Former Winona Hotel Pressing Club is located within the wellhead protection area of both Municipal Water Supply Wells (Reference 1). The Site is also located within an area of mixed land usage which includes small businesses, restaurants, the McLean Water Plant (at the Municipal Supply Well No. 1) of the Fort Valley Utilities Commission and the Woolfolk Chemical Works Industrial Complex (Reference 2)(Figure 2.2).

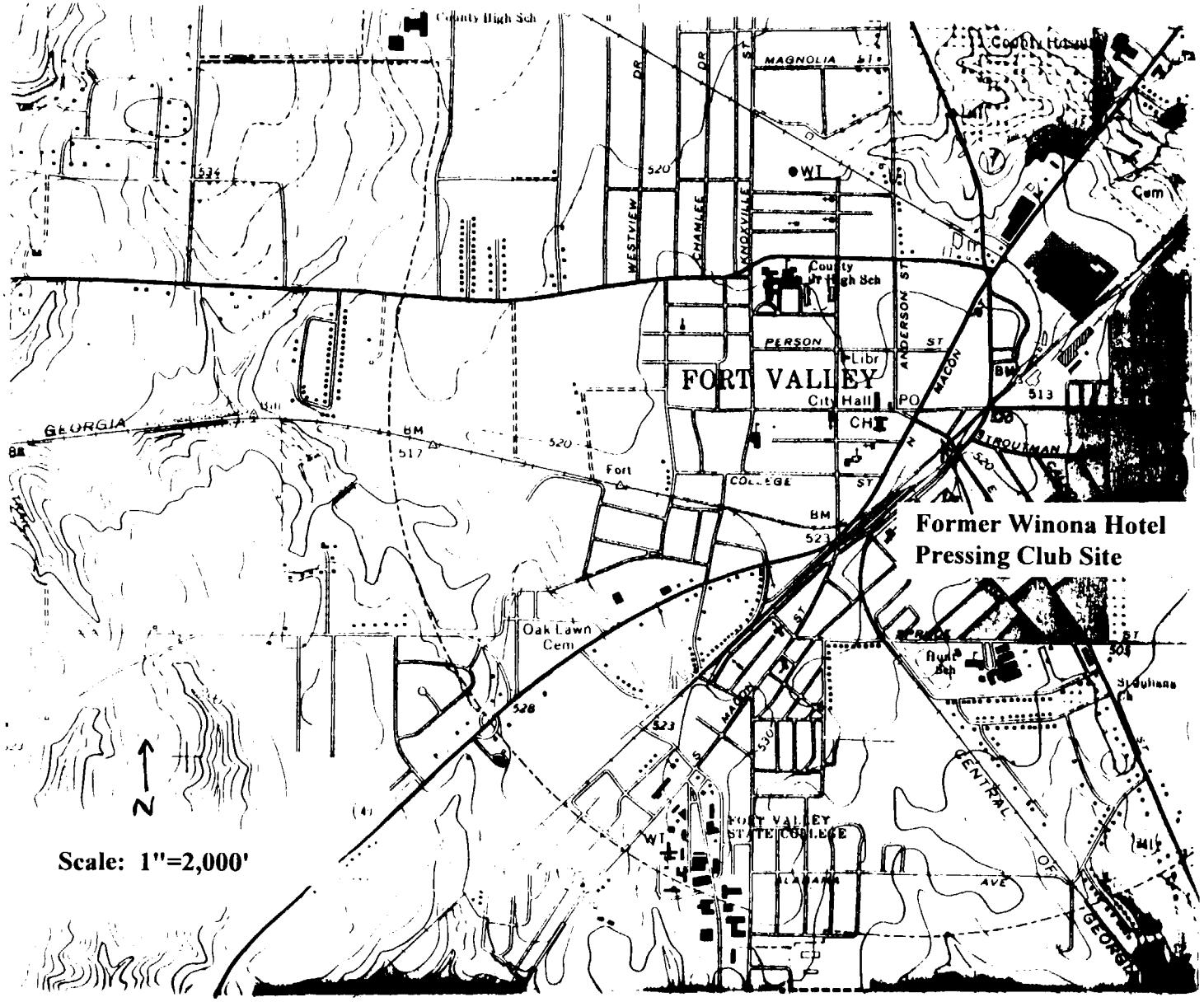



Figure 2.1 - U.S. Geological Survey 7.5 Minute Series Topographic Map (Fort Valley West, 1973) of the Former Winona Hotel Pressing Club Site.

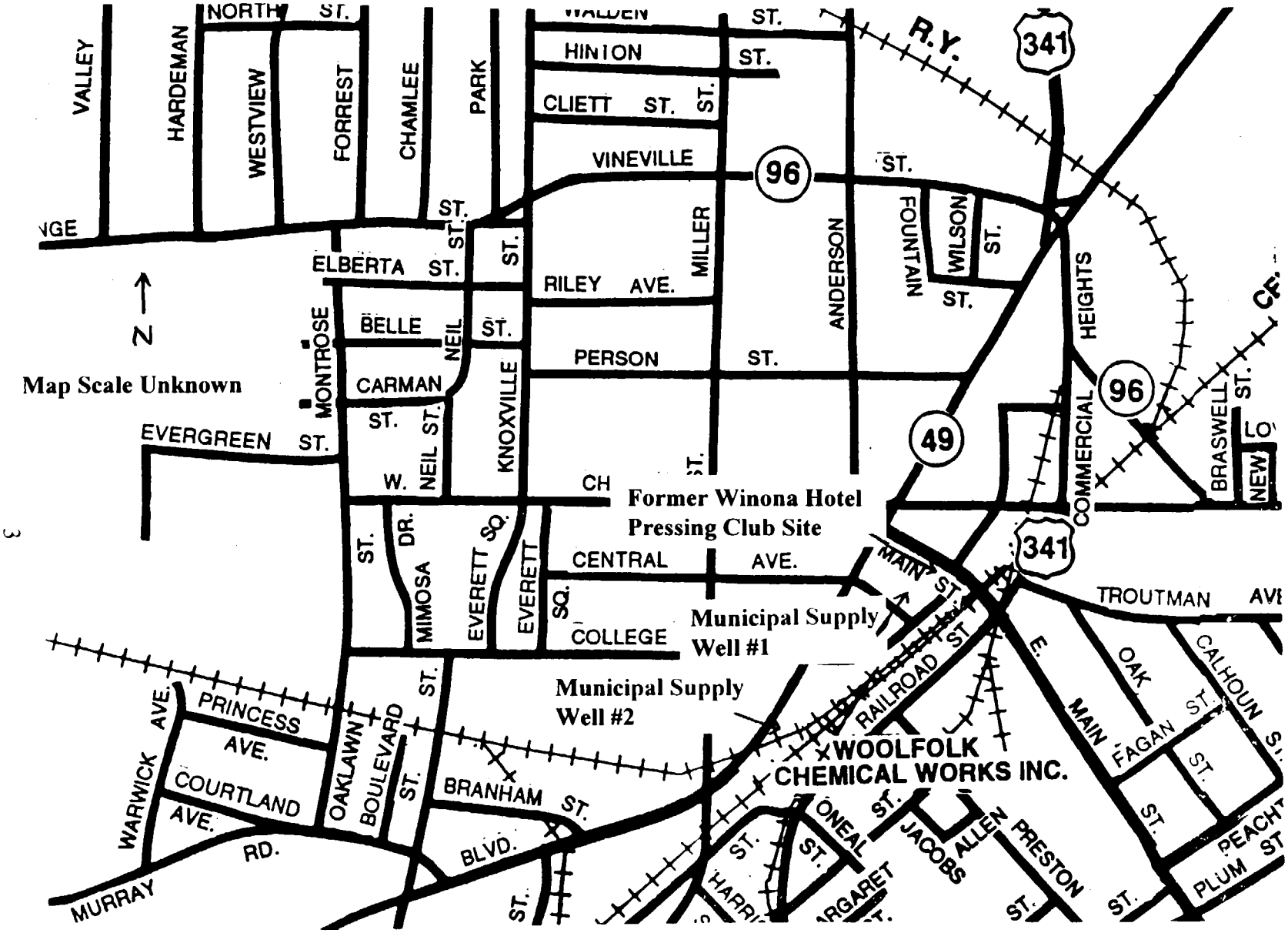



Figure 2.2 Former Winona Hotel Pressing Club Location on a City of Fort Valley Map.

Tetrachloroethylene (PCE) has been detected in the Fort Valley Municipal Water Supply Wells Nos. 1 and 2 at concentration ranges of 1 ug/l to 18 ug/l and 1 ug/l to 16 ug/l, respectively (References 2 and 3; Also See Figure 2.2).

### 2.3 Operational History and Waste Characteristics

Limited history is known of the Former Winona Hotel Pressing Club. According to Mr. Calvin Mason, the former owner of this property, the Pressing Club associated with the Winona Hotel (also known as the Harris House) operated until approximately 1934 and was managed by Mr. Miles Johnson. According to Mr. Mason, the Pressing Club routinely dumped excess dry cleaning fluids on the ground and these fluids would drain from the Club along the then-unpaved preferential pathway shown in Figure 2.3. Mr. Mason also reported that a large number of pigs were killed on a farm in the City of Fort Valley in the early 1930s; these animals reportedly died from drinking contaminated water which drained from the Pressing Club and other businesses in the city at that time. The Winona Hotel was torn down in the early 1970s.

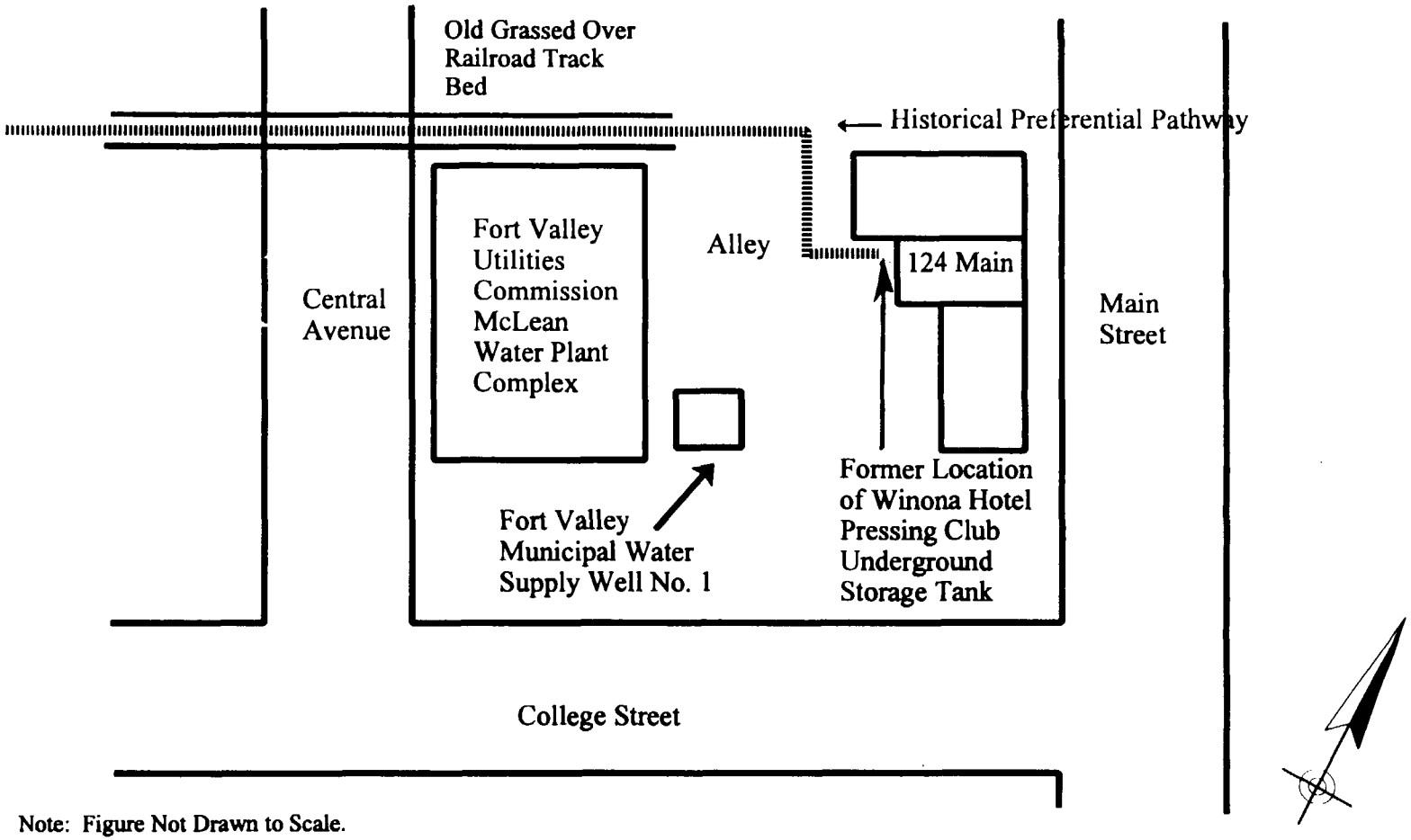
In February 1975, a tornado destroyed the Old Fort Valley Water and Light Building and heavily damaged the City of Fort Valley; Mr. Mason bought the property at 124 Main Street the following month. As part of the cleanup efforts in the aftermath of the tornado, the City of Fort Valley regraded the area behind Mr. Mason's store. During this effort in April 1978, an approximately 500-gallon UST was discovered and removed. Mr. Mason stated that the tank contained a couple of hundred gallons of liquid that he believed to be dry cleaning fluid and that the liquid and soils around the tank had a very strong kerosene-like odor. Contaminated soils were removed within the UST excavation to a depth of approximately eight (8) feet below the current ground surface. Final disposition of the UST and the contaminated soils is unknown (References 1, 2, and 3).

Documented releases of PCE cannot be confirmed at the Former Winona Hotel Pressing Club Site with the information known at this time; however, the former location of the Winona Hotel Pressing Club is approximately 40-50 feet northwest of the PCE-contaminated Fort Valley Municipal Water Supply Well No. 1. Given the historical account provided by Mr. Mason, the potential for historical releases of PCE from the Former Winona Hotel Pressing Club is high.

## 3.0 SAMPLING ACTIVITIES

An attempt will also be made to locate the nearest private drinking water well. If a well is located a groundwater sample will be collected.

All environmental media sampling will be conducted according to standard operating procedures specified in the U.S. Environmental Protection Agency (EPA) Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996.




Note: Figure Not Drawn to Scale.

Figure 2.3: Preferential Drainage Pathway from Former Winona Hotel Pressing Club

## 3.1 Surface Water Sampling

No surface waters (i.e., streams or drainage ditches containing standing/moving water) were identified as potential receptors of the hazardous substances which may have been managed at the Former Winona Hotel Pressing Club. Although a preferential migration pathway existed during the time of the suspected releases, current conditions do not mirror the conditions that probably existed 50 years ago. Most of the area around the site is now developed, paved for roads, or asphalted for parking lots. Therefore, no surface water samples will be collected during this SI.

## 3.2 Sediment Sampling

No surface waters (i.e., streams or drainage ditches containing standing/moving water) were identified as potential receptors of the hazardous substances which may have been managed at the Former Winona Hotel Pressing Club; Although a preferential migration pathway existed during the time of the suspected releases, current conditions do not mirror the conditions that probably existed 50 years ago. Most of the area around the site is now developed, paved for roads, or asphalted for parking lots. Therefore, no sediment samples will be collected during this SI. Soil samples will be taken along the closest parts of the historical preferential migration pathway as detailed in Section 3.4.

## 3.3 Groundwater Sampling

Groundwater samples will be collected from a maximum of six Geoprobe boring locations, depending on groundwater availability, shown on Figure 3.1. In addition, a monitoring well is located next to the Fort Valley Municipal Water Supply Well No. 1. Mr. Gary Dye of the Fort Valley Utilities Commission (McLean Water Plant) stated that the he had a key to that monitoring well, approximately 25 feet deep, and that GA EPD should coordinate with him in order to collect a groundwater sample from the well. To the best of his knowledge, the well has been there for at least 9 years. His telephone number at the McLean Water Plant is 912/825-5482 (Reference 4). GA EPD will coordinate with Mr. Dye and will collect a groundwater sample from this monitoring well. This well sample will be analyzed for Volatile Organic Compounds (VOCs) in accordance with EPA SW-846 approved methods. The sample will be collected in accordance with the EPA Region IV SOP/QAM dated May 1996, following the purging of at least three (3) well volumes. A duplicate will also be taken at this monitoring well.

Groundwater samples will be collected within the surficial aquifer [expected at approximately fifteen (15) to twenty-five (25) feet below ground surface] via Geoprobe techniques and will be analyzed for VOCs in accordance with EPA SW-846 approved methods.

Samples will be collected through new clean tubing using the Geoprobe rod. Because the samples will be obtained using a Geoprobe, purging will not be necessary.

It should also be noted that the Georgia Geologic Survey Branch of GA EPD is also proposing to install five (5) permanent monitoring wells as part of their Phase I investigation of contamination of two of the municipal supply wells in the City of Fort Valley. The relevant groundwater analytical data from that field effort will be included in the Former Winona Hotel Pressing Club SI Report. Sampling of these wells will be conducted by the Safe Drinking Water Program of the Georgia EPD (Reference 5). All proposed sampling locations are indicated on Figure 3.1.

### 3.4 Soil Sampling

Soil samples will be collected from the soil samples retrieved by the Geoprobe. Up to two (2) soil samples will be collected at each Geoprobe location shown on Figure 3.1. Soil samples will be screened with a HNu photoionization detector (PID). Soil samples will be collected at two (2) Geoprobe borings at the Former Location of the Winona Hotel Pressing Club UST at depths of nine (9) feet and twelve (12) feet below ground surface (See Figure 3.1 and note that the depth of the surficial aquifer is expected to be approximately fifteen (15) to twenty-five (25) feet below ground surface).

Soil samples at the remaining four (4) Geoprobe Sampling Locations will be collected at three (3) feet and eight (8) feet below ground surface. All soil samples will be analyzed for VOCs in accordance with EPA SW-846 approved methods. All proposed sampling locations are indicated on Figure 3.1.

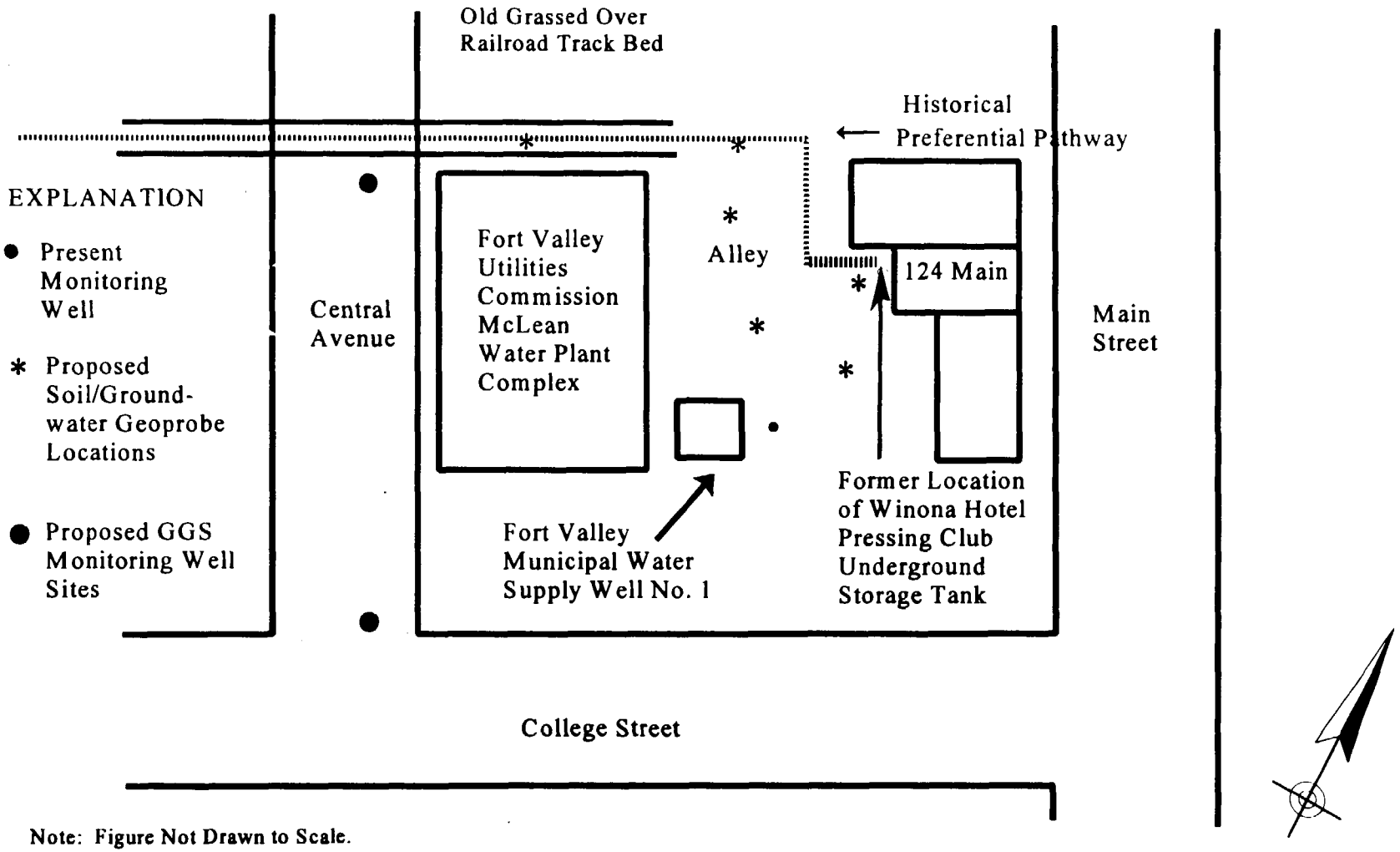
### 3.5 Groundwater and Soil Sampling to determine Background Concentrations

The site is surrounded heavily by development, including light industrial, heavy industrial, and commercial operations. The selection of suitable background will be determined at the time of the initial investigations.

### 3.6 Quality Assurance

Quality assurance and quality control (QA/QC) for this sampling event will be provided by collecting duplicate samples. One duplicate sample for each matrix sample will test the reliability of sampling procedures and results. Appropriate trip blanks and rinsate blanks, if decontamination is required, will be taken.

All sample collection, preservation, QA/QC preparation of duplicates and chain-of-custody procedure used during the sampling activities will be in accordance with the standard operating procedures specified in the EPA Region IV SOP/QAM dated May 1996.




Note: Figure Not Drawn to Scale.

Figure 3-1 Proposed Sampling Locations at the Former Winona Hotel Pressing Club

### 3.7 Field Activities

Field personnel are scheduled to travel to the site during the period of October 27 to November 7. Site access and access to drill on related properties will be obtained by EPD prior to that time. All utilities will be previously marked before the field activities begin.. All environmental samples and non-sampling information will be collected during that week. Field personnel are scheduled to leave the site by November 7, 1997.

Prior site reconnaissance will be conducted to verify that planned sample locations are appropriate and accessible. Upon verifying the sample locations and after any modifications are confirmed, sampling will begin. Sampling will begin with the upgradient sites.

Field personnel that may be involved with the site drilling and associated activities are included in Table 5.1 All personnel will be properly OSHA certified prior to site admittance. When required, proper site restrictions will be implemented.

### 3.8 Quality Control Procedures

All sampling will be performed with dedicated sampling equipment. All samples will be stored in coolers on ice until they are delivered to the GA EPD laboratory at the end of each day. Chain-Of-Custody will be maintained according to GA EPD SOP Section 4.2 (Appendix 6) by field personnel until samples are handed over to the GA EPD Laboratory in Atlanta.

## 4.0 INVESTIGATORY DERIVED WASTE PLAN

The purging of the monitoring well located between the Municipal Supply Well #1 and the Former Winona Hotel Pressing Club will require purging. Purge water will be containerized on site, pending analytical results. Disposal will be determined from the analytical results. No investigative derived waste is expected from the Geoprobe activities, with the exception of personal protective equipment (PPE). PPE will be containerized and removed at each day's end.

Decontamination wastes will be generated at the GGS's decontamination pad. IDW generated as a result of decontamination will be handled by GGS with the remainder of the IDW.

## 5.0 PROJECT MANAGEMENT

The project management for the Former Winona Hotel Pressing Club SI will be a team effort. The team will schedule field activities, personnel requirements, verify site access authority, direct and oversee all on-site and off-site activities associated with the investigation. The team will document and manage all collected samples.

| Personnel | Job Title | Site Responsibilities | Signature that plan has been read |
|---|---|---|---|
| Brent Rabon | Environmental Engineer | Coordinate Sampling Activities | |
| Eddie Williams | Senior Geologist | Assist in Geoprobe Operation and Sampling | |
| Thomas Williams | Environmental Engineer | Geoprobe Operator | |
| Bob Pierce | Advanced Geologist | Assist in Geoprobe Operation and Sampling | |
| Steve White | Environmental Specialist | Coordinate Fort Valley Project | |

## 5.1 Health and Safety

Safety monitoring equipment will be an HNu meter. Field protection will be level D during the site reconnaissance. Field dress for the reconnaissance will include work boots, disposable gloves, hardhats, and ear plugs. Disposable gloves will be worn during all sampling events and decontamination. All personnel will the OSHA certified prior to admittance to the site(s).

## 5.2 Project Schedule

Non-sampling data collection will begin in early October 1997. The SI field work will take place during the weeks of October 27 to November 7, 1997. GGS monitoring well completions have already begun and will continue to completion [currently expected to take five (5) weeks]. When the field tasks are completed, preparation of the SI Report will begin. Upon receipt of the analytical results, the scoring package for the site will be completed. The Final SI report will be completed by the end of the calendar year.

## 6.0 REFERENCES


1. GA EPD Correspondence (Ussery to McKeown) dated June 3, 1997; Summary Preliminary Assessment, Former Dry Cleaner - Main Street (Name Unknown), Peach County, Georgia.

2. GA EPD Site Visit to Fort Valley by Bob Pierce, Brent Rabon, Steve White and Eddie Williams; August 19, 1997.

3. GA EPD Site Visit to Fort Valley and Interview with Mr. Calvin Mason by Brent Rabon; September 11, 1997.

4. GA EPD Telephonic Conversation (E. Williams) with Mr. Gary Dye, Fort Valley Utilities Commission, September 24, 1997.

5. GA EPD Georgia Geologic Survey Fort Valley Phase I Investigation Plan, September 12, 1997.


r:\BRENTR\SI\FTVALL\WRKPLAN

# Georgia Department of Natural Resources

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Environmental Protection Division
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**MEMORANDUM**

September 12, 1997

To: William H. McLemore
State Geologist

From: Roger Carter
Regulatory Program Manager

James S. Guentert
Geologist

Larry Papetti
Geologist

Subject: Fort Valley Phase I Investigation Plan

The purpose of the Phase I investigation is to: (1) gain a better understanding of the hydrogeology and geology, (2) evaluate the perched and water table aquifer groundwater quality in the vicinity of City to both identify potential PCE sources and to allow deeper drilling and (3) evaluate the depths at which contaminants are entering City Well 1 and City Well 2. The following three tasks have been designed to achieve these objectives.

**Task I - Monitoring Well Installation and Sampling**

Monitoring wells are proposed to be installed at five locations in Ft. Valley in the general vicinity of city wells 1,2, and 5 as shown on Figure 1. Monitoring wells will be installed in streets in Ft Valley, because of insufficient right-of-way width along the streets, presence of above and below ground utilities, and inherent problems with obtaining permission and drilling on private property The City of Fort Valley has agreed that three monitoring well locations can be in Central Street and one in College Street. The fifth monitoring well location will be in State Highway 49, if permission is granted from the Georgia Department of Transportation.

Drilling Methods and Well Construction

Monitoring wells will be installed in the water table aquifer, which is anticipated to be

encountered at a depth of 100 - 120 feet. A shallow monitoring well will also be installed and sampled at each location, prior to drilling deeper, if a perched water bearing zone is encountered. A perched zone has been identified in this area above a kaolinite layer at a depth of 40 - 50 feet below ground level. A maximum of two monitoring wells at each of the five locations will be installed during this Phase I Investigation.

A hand auger will be used to dig to a depth of four feet at each location prior to drilling. The boreholes will be advanced using 4 1/4-inch I.D. hollow stem augers. Monitoring wells will be constructed with 2-inch diameter PVC casing and either 5-foot or 10-foot slotted screens. The annular space between the screen and borehole will be filled with an appropriately sized silica sand from the base of the borehole to approximately 2-feet above the top of the screen. A minimum 2-foot thick layer of bentonite hole plug will be placed above the sandpack. The remaining annular space will be filled with a cement-bentonite slurry grouted, pumped through a tremie pipe from the top of the hole plug layer to the ground surface.

An 8 1/4-inch diameter PVC surface casing will be installed, prior to drilling to the water table, at locations where a perched groundwater zone is encountered. The surface casing will be installed no closer than 5-feet from the perched groundwater monitoring well. Surface casings, where needed, will be installed by drilling 2-3 feet into the underlying kaolinite layer (approximately 50 feet) with 11 1/4-inch O.D hollow stem augers. The augers will then be removed, and the PVC casing installed in the open borehole. The annular space will be filled with a cement slurry grout from the base of the borehole to surface. The cement will be allowed to cure for at least 24 hours, before advancing 4 1/4-inch ID augers through the PVC surface casing to the water table. A monitoring well with a 10-foot screen will be installed in the upper portion of the water table as described above.

Monitoring wells will either be developed by hand bailing or through the use of a 2-inch diameter variable-flow submersible pump. Development water will be containerized in drums for later disposal.

Monitoring wells will be fitted with a locking, water-tight cap and completed with a flush-mounted, traffic-rated cover which is cemented in place.

Monitoring Well Surveying

Monitoring well locations and top-of-casing measuring points will be determined by a registered land surveyor. Top-of-casing measuring points will be determined to an accuracy of 0.01 feet and referenced to NGVD.

Soil Sampling and Analysis

Continuous soil cores will be collected using either a split core-barrel sampler, or split-spoon sampler. Grab samples will be collected from the cores at 2.5-foot intervals for field PID screening and/or laboratory analyses. One half of each soil grab sample will immediately be

placed in a ziplock bag, and screened for organic vapors in the field using a PID. The second half of each soil grab sample will immediately be placed in a soil jar and kept on ice for possible laboratory analysis. Soil samples for which PID readings above background values are obtained will be sent for laboratory analysis by EPA Method 502.2 (which includes PCE as a parameter). Otherwise, the deepest unsaturated soil sample will be sent for laboratory analysis. Additionally, a soil sample from the bottom of each boring (whether saturated or unsaturated) will be collected and analyzed by EPA Method 8260

Augers, drill rods, and soil sampling devices will be steam-decontaminated prior to drilling each well. Prior to collection of each soil sample within a boring, the sampling device will be scrubbed with a liquinox-water solution, rinsed with tap water, sprayed with isopropanol, and given a final rinse with distilled water.

At least one equipment rinseate blank will be collected per boring for soil sampling equipment. The equipment rinseate blank will be collected by pouring distilled water into the sample bottle through the decontaminated sampling device to be used for the first sample in each boring. The equipment rinseate blank will be analyzed by EPA Method 502.2.

Groundwater Sampling and Analysis

A new disposable teflon bailer will be used for each well. New disposable, powder-free latex gloves will be worn during sampling activities.

At least 3 well volumes of water will be purged from each monitoring well prior to sampling. During purging, pH, conductivity, and temperature will be monitored. If pH, temperature, and conductivity have not stabilized by the third well volume, purging will continue until the measurements have stabilized, or 5 well volumes have been removed.

Groundwater samples will be collected, and analyzed for volatile organic compounds (VOCs) by EPA Method 502.2 (the standard drinking-water analysis for VOCs). Immediately after collection, groundwater samples will be placed on ice. Quality assurance samples will include one field duplicate (split of one groundwater sample), one bailer rinseate blank (obtained by pouring distilled water through a clean bailer prior to use in a well), and one travel blank (sample of distilled water prepared by the laboratory to accompany sample bottles during transport) per sampling event. During the sampling event, monitoring wells with previously-confirmed contamination, or with suspected contamination (odor, etc.) will be sampled subsequently to wells expected to be clean.

Development water from all wells not previously shown to be clean will be contained in D.O.T.-compliant, properly labeled drums, and stored on fenced City of Ft. Valley property until analytical results are obtained. Contaminated development water will then either be disposed of by permitted, licensed contractors or discharged to the city sewer system.

Drill Cuttings and Fluids

Investigation derived soils and water will be handled in general accordance with the attached Investigation Derived Waste (IDW) Management Plan.

Drill cuttings and drilling mud will be staged at each location on plastic, awaiting transportation to a centrally located, lined roll-off box. The roll-off box will be kept in the fenced and locked municipal garage compound and will be covered with a plastic tarp. Liquids which may accumulate after the drilling mud has settled will be pumped off periodically into 55-gallon, steel drums. If determined to be non-hazardous the roll-off box will be transported to a Subtitle D landfill for disposal.

Sampling purge water and development water will be collected from each well in a separate 55-gallon, steel drum. Depending on the analytical results and levels of contaminants the water may be discharged to the City of Ft. Valley sewer system or disposed of at a licensed and permitted waste management facility.

**Task II - Gamma Ray Logging**

City well 1 and 2 and the deepest monitoring well installed by EPD at each location will be gamma ray logged using the Georgia Geologic Survey's logging van and equipment. Logging the city wells is dependant on the Fort Valley Utility Commission contracting the removal of the pumps and associated pipe and any residual lubricant oil floating on the water surface.

**Task III - Screened Interval Sampling**

Discreet groundwater samples will be collected from each screened interval in City Wells 1 and 2. The success of this task will be dependant on how accurately the screened intervals in each well can be identified. Historic downhole television logs in combination with driller's logs from City Well 1 and 2 will be used to identify the screened intervals. It is anticipated that 3-5 samples will be collected from each well.

Groundwater samples will be collected using a low-flow sampling pump, positioned in the middle of each screened interval. More than one sample may be collected in screened intervals greater than 20 feet long. The groundwater pH, temperature and conductivity will be carefully monitored to assist in collecting a groundwater sample representative of the formation quality at that depth, with minimal input form water stored within the gravel pack or stagnant water within the casing The pump that will be utilized is a nitrogen-operated, bladder pump capable of collecting groundwater samples from as deep as 1000 feet below ground level. If successful, this technique should give some indication of the depths where contaminated groundwater is entering the city wells. An added benefit of low-flow sampling is that the volume of purge water is minimized. Purge water from each interval will be containerized separately and disposed of based on the laboratory analytical results.

Groundwater samples collected from the screened intervals will be analyzed for volatile organic compounds, total metals, pesticides and herbicides.

# ATTACHMENT

## CONSIDERATIONS FOR MANAGING INVESTIGATION DERIVED WASTES

This plan addresses management of investigation derived waste (IDW) associated with investigative activities to be performed by the GGS Field Team. Wastes of concern include drill cuttings and mud, development/purge water from monitoring wells, contaminated personnel protective equipment (gloves, etc), sampling equipment (bailers, etc), drilling equipment (augers, etc), and soil and groundwater samples themselves.

In Particular, the following three EPA documents were reviewed in plan preparation:

- a quick reference Fact Sheet entitled *Guide to Management of Investigation-Derived Wastes* (January 1992), Publication 9345.3-03FS;
- a Region IV internal guidance memorandum TSC-92-02 entitled *Management of Contaminated Media* (December 28, 1992); and
- Section 5.15 (entitled *Investigation Derived Waste*) of the *Standard Operating Procedures-Quality Assurance Manual* (May 1996).

The following USTMP documents were also reviewed:

- *Petroleum Contaminated soil Disposal/Treatment--Guidance Document* (8/95, GUST-39); and
- *So You Want To Close An UST?--Petroleum Releases* (8/95, GUST-9).

**IDW Potentially Contaminated by a Listed or Characteristic Hazardous Waste, or by Petroleum from a Non-Exempted Source**

The *Decision Matrix for Managing Contaminated Media*, which is included in the December 28, 1992 EPA Region IV guidance memorandum, should be applied to IDWs which are potentially hazardous or non-exempted wastes. Accordingly, if an IDW is not suspected of being contaminated, or has been shown to be non-contaminated, then best management practices apply. For instance, non-contaminated or decontaminated soil, drilling mud, or development/purge water might be disposed of on the ground in the vicinity of the boring or well from which it was derived. Non-contaminated or decontaminated personnel protective equipment and sampling equipment should be disposed of in an ordinary household (Subtitle D) garbage recepticle such as a city dumpster.

IDW suspected or known to be contaminated by hazardous or non-exempted petroleum wastes should be managed as follows:

Drill cuttings and mud, decontamination fluids, and well development/purge water should be contained in drums or appropriate containers until analytical results are obtained. Containers and drums should be segregated by well/boring location in order to minimize the volume of contaminated media. The drums or containers should be temporarily labelled with drum markers identifying their contents, generator name and address, and date. If soil or groundwater analytical results indicate that the contained IDW might be contaminated by a hazardous or non-exempted petroleum waste, then a TCLP test should be run on the drum/container contents to determine if it is a characteristic waste.

If TCLP analysis indicates that the drum/container contents are non-hazardous and non-contaminated, then the IDW should be disposed of by spreading onsite as described in the first paragraph of this section. If the contents pass the TCLP test (are non-hazardous), but are still contaminated above detection limits, then the drum/container should be labelled with an EPA/DOT compliant non-hazardous waste sticker, and the contents either disposed of in a RCRA Subtitle D Municipal Solid Waste Landfill, soil treatment (recovered materials) facility, or other licensed facility; or managed according to best management practices. Best management practices for contaminated, non-hazardous soil might consist of decontaminating soil onsite (ie spreading soil out on plastic sheeting, and allowing it to volatilize in the sun) and subsequent onsite disposal. If the drum/container contents fail the TCLP test, they should be labelled with an EPA/DOT-compliant hazardous waste sticker, and properly manifested and disposed of as a hazardous waste by a licensed waste hauler.

An exclusion is provided in *40 CFR Section 261.4(d)* for soil and groundwater samples in the process of being analyzed, or being transported for analysis. After analysis, the samples, if hazardous, will be properly disposed of by the EPD laboratories.

**IDW Potentially Contaminated by Petroleum from a Regulated UST Source**

We recommend that IDWs suspected of being contaminated by petroleum from a regulated UST source be managed according to GUST guidelines. Sampling equipment and PPE should be decontaminated onsite, and disposed of in a Subtitle D facility. Groundwater suspected of being contaminated should be drummed/containerized and labelled as described in the previous section. Soil suspected of being contaminated should be stockpiled on an inpermeable surface (ie concrete or asphalt), and enveloped in plastic sheeting unless it contains free product, in which case it should be drummed. If soil and/or groundwater analytical results indicate that the drummed/containerized/stockpiled IDW is likely to be contaminated, then it should be sampled for the suspected petroleum compounds. If sampling indicates that the IDW is clean, then it can be disposed of onsite as described in the previous section. If the soil is determined to be contaminated with petroleum from a regulated UST source, then it should be disposed of in a Municipal Solid Waste Landfill, or soil treatment (recovered materials) facility according to the GUST guidance document: *Petroleum Contaminated Soil Disposal/Treatment*.
Drummed/contained groundwater which is contaminated by petroleum from a regulated UST

source but is non-hazardous, should be labelled as non-hazardous with an appropriate sticker, and disposed of by a licensed waste disposal facility.

# Appendix F: Superfund Chemical Data Matrix Sheets for Analytes Discovered during Site Inspection

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | 1.0E-01 | mg/kg/day | IRIS |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | | (mg/kg/day)^-1 | |
| Oral Wt-of-Evid: | | | |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | | mg/kg/day | |
| Oral ED10 Wgt: | | | |
| Inhal ED10: | | mg/kg/day | |
| Inhal ED10 Wgt: | | | |
| Oral LD50: | 8.5E+03 | mg/kg | ACGIH |
| Dermal LD50: | 2.0E+04 | mg/kg | RTECS |
| Gas Inhal LC50: | | ppm | |
| Dust Inhal LC50: | 5.0E+01 | mg/L | RTECS |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Fresh Ecol LC50: | 1.0E+04 | µg/L | AQUIRE |
| Salt Ecol LC50: | 2.1E+06 | µg/L | AQUIRE |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.2E+00 | days | THOMAS |
| Photolysis: | | days | |
| Biodeg: | 7.0E+00 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.2E+00 | days | THOMAS |
| Photolysis: | | days | |
| Biodeg: | 7.0E+00 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | -2.4E-01 | | RTI_LOGP |

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | Yes |
| Particulate: | No |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 5.81E+01 |
| Density: | 7.9E-01 g/mL @ 20.00° C |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 2.3E+02 | Torr | CHEMFATE |
| Henry's Law: | 3.9E-05 | atm-m3/mol | CHEMFATE |
| Water Solub: | 1.0E+06 | mg/L | CHEMFATE |
| Distrib Coef: | 1.2E-03 | ml/g | |
| Geo. Mean Sol.: | | | |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| ENVIRONMENTAL | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| Log Kow: | -2.4E-01 | | RTI_LOGP |
| Water Solub: | 1.0E+06 | mg/L | CHEMFATE |

## OTHER DATA

Melting Point :-94.80° C
Boiling Point :56.00° C
Formula :C3H6O

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Gas Mobility: | 1.0000 |
| Gas Migration: | 17 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Water Solub: | 1.0E+06 |
| Distrib: | 1.2E-03 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10 |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Persistence | |
| River: | 0.4000 |
| Lake: | 0.0700 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Persistence | |
| River: | 0.4000 |
| Lake: | 0.0700 |
| Bioaccumulation | |
| Fresh: | 0.5 |
| Salt: | 0.5 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | 100 |
| Salt Tox: | 1 |
| Persistence | |
| River: | 0.4000 |
| Lake: | 0.0700 |
| Bioaccumulation | |
| Fresh: | 0.5 |
| Salt: | 0.5 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | 3.7E+00 | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | 7.8E+03 | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | 3.7E+00 | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | 1.4E+02 | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | 2.0E-01 | mg/kg/day | IRIS |
| Inhal RfD: | 1.1E-01 | mg/kg/day | IRIS |
| Oral Slope: | | (mg/kg/day)^-1 | |
| Oral Wt-of-Evid: | | | |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | | mg/kg/day | |
| Oral ED10 Wgt: | | | |
| Inhal ED10: | | mg/kg/day | |
| Inhal ED10 Wgt: | | | |
| Oral LD50: | 5.0E+03 | mg/kg | C_EENV |
| Dermal LD50: | 1.2E+04 | mg/kg | ACGIH |
| Gas Inhal LC50: | 5.3E+03 | ppm | ACGIH |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Fresh Ecol LC50: | 5.5E+03 | µg/L | AQUIRE |
| Salt Ecol LC50: | 6.2E+03 | µg/L | AQUIRE |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 8.4E+01 | days | THOMAS |
| Photolysis: | | days | |
| Biodeg: | 2.2E+01 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 9.1E-01 | days | THOMAS |
| Photolysis: | | days | |
| Biodeg: | 2.2E+01 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 2.8E+00 | | RTI_LOGP |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | Yes |
| Particulate: | No |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 9.21E+01 |
| Density: | 8.7E-01 g/mL @ 20.00° C |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 2.8E+01 | Torr | CHEMFATE |
| Henry's Law: | 6.6E-03 | atm-m3/mol | CHEMFATE |
| Water Solub: | 5.3E+02 | mg/L | LIVECHEM |
| Distrib Coef: | 3.6E-01 | ml/g | SSG_KD |
| Geo. Mean Sol.: | | | |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| ENVIRONMENTAL | | | |
| Fresh BCF: | | | |
| Salt BCF: | 3.1E+01 | | AQUIRE |
| Log Kow: | 2.8E+00 | | RTI_LOGP |
| Water Solub: | 5.3E+02 | mg/L | LIVECHEM |

## OTHER DATA

Melting Point :-94.90° C
Boiling Point :110.60° C
Formula :C7 H8

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Gas Mobility: | 1.0000 |
| Gas Migration: | 17 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Water Solub: | 5.3E+02 |
| Distrib: | 3.6E-01 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10 |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Persistence | |
| River: | 0.4000 |
| Lake: | 0.4000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Persistence | |
| River: | 0.4000 |
| Lake: | 0.4000 |
| Bioaccumulation | |
| Fresh: | 50.0 |
| Salt: | 50.0 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | 100 |
| Salt Tox: | 100 |
| Persistence | |
| River: | 0.4000 |
| Lake: | 0.4000 |
| Bioaccumulation | |
| Fresh: | 50.0 |
| Salt: | 50.0 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | 4.2E-01 | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | 1.0E+00 | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | 7.3E+00 | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | 1.6E+04 | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | 1.0E+00 | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | 7.3E+00 | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | 2.7E+02 | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | | mg/kg/day | |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | 7.3E-01 | (mg/kg/day)^-1 | LIVECHEM |
| Oral Wt-of-Evid: | B2 | | LIVECHEM |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | 4.7E-02 | mg/kg/day | EPA_ED10 |
| Oral ED10 Wgt: | B2 | | EPA_ED10 |
| Inhal ED10: | 4.7E-02 | mg/kg/day | EPA_ED10 |
| Inhal ED10 Wgt: | B2 | | EPA_ED10 |
| Oral LD50: | | mg/kg | |
| Dermal LD50: | | mg/kg | |
| Gas Inhal LC50: | | ppm | |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Fresh Ecol LC50: | 1.0E+01 | µg/L | AQUIRE |
| Salt Ecol LC50: | | µg/L | |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | Yes |
| Particulate: | Yes |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 2.28E+02 |
| Density: | |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 1.1E-07 | Torr | CHEMFATE |
| Henry's Law: | 3.4E-06 | atm-m3/mol | CHEMFATE |
| Water Solub: | 9.4E-03 | mg/L | CHEMFATE |
| Distrib Coef: | 8.0E+02 | ml/g | |
| Geo. Mean Sol.: | | | |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| ENVIRONMENTAL | | | |
| Fresh BCF: | 1.0E+04 | | AQUIRE |
| Salt BCF: | | | |
| Log Kow: | 5.7E+00 | | RTI_LOGP |
| Water Solub: | 9.4E-03 | mg/L | CHEMFATE |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.4E+02 | days | THOMAS |
| Photolysis: | 1.3E-01 | days | FATERATE |
| Biodeg: | 6.8E+02 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.2E+01 | days | THOMAS |
| Photolysis: | 1.3E-01 | days | FATERATE |
| Biodeg: | 6.8E+02 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 5.7E+00 | | RTI_LOGP |

## OTHER DATA

Melting Point :84.00° C
Boiling Point :
Formula :C18H12

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Gas Mobility: | 0.0020 |
| Gas Migration: | 6 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Water Solub: | 9.4E-03 |
| Distrib: | 8.0E+02 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 50000.0 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | 10000 |
| Salt Tox: | 10000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 50000.0 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | 1.2E-04 | mg/L |
| Non Cancer Risk: | | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | 8.8E-01 | mg/kg |
| Non Cancer Risk: | | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | 1.2E-04 | mg/L |
| Non Cancer Risk: | | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | 4.3E-03 | mg/kg |
| Non Cancer Risk: | | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | | mg/kg/day | |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | 7.3E+00 | (mg/kg/day)^-1 | IRIS |
| Oral Wt-of-Evid: | B2 | | IRIS |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | 4.0E-03 | mg/kg/day | EPA_ED10 |
| Oral ED10 Wgt: | B2 | | EPA_ED10 |
| Inhal ED10: | 4.0E-03 | mg/kg/day | EPA_ED10 |
| Inhal ED10 Wgt: | B2 | | EPA_ED10 |
| Oral LD50: | | mg/kg | |
| Dermal LD50: | | mg/kg | |
| Gas Inhal LC50: | | ppm | |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Fresh Ecol LC50: | 5.0E+00 | µg/L | AQUIRE |
| Salt Ecol LC50: | 1.0E+03 | µg/L | AQUIRE |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.8E+02 | days | THOMAS |
| Photolysis: | 4.6E-02 | days | FATERATE |
| Biodeg: | 5.3E+02 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 3.6E+01 | days | THOMAS |
| Photolysis: | 4.6E-02 | days | FATERATE |
| Biodeg: | 5.3E+02 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 6.1E+00 | | RTI_LOGP |

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | Yes |
| Particulate: | Yes |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 2.52E+02 |
| Density: | |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 5.5E-09 | Torr | CHEMFATE |
| Henry's Law: | 1.1E-06 | atm-m3/mol | CHEMFATE |
| Water Solub: | 1.6E-03 | mg/L | CHEMFATE |
| Distrib Coef: | 2.0E+03 | ml/g | |
| Geo. Mean Sol.: | | | |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | 8.3E+04 | | VER_BCF |
| Salt BCF: | 2.4E+02 | | VER_BCF |
| ENVIRONMENTAL | | | |
| Fresh BCF: | 8.3E+04 | | VER_BCF |
| Salt BCF: | 2.4E+02 | | VER_BCF |
| Log Kow: | 6.1E+00 | | RTI_LOGP |
| Water Solub: | 1.6E-03 | mg/L | CHEMFATE |

## OTHER DATA

Melting Point :176.50° C
Boiling Point :
Formula :C20H12

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10000 |
| Gas Mobility: | 0.0002 |
| Gas Migration: | 6 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10000 |
| Water Solub: | 1.6E-03 |
| Distrib: | 2.0E+03 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10000 |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | 10000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | 10000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 500.0 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | 10000 |
| Salt Tox: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 500.0 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | 2.0E-04 | mg/L |
| Cancer Risk: | 1.2E-05 | mg/L |
| Non Cancer Risk: | | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | 8.8E-02 | mg/kg |
| Non Cancer Risk: | | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | 2.0E-04 | mg/L |
| Cancer Risk: | 1.2E-05 | mg/L |
| Non Cancer Risk: | | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | 4.3E-04 | mg/kg |
| Non Cancer Risk: | | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | | mg/kg/day | |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | 7.3E-01 | (mg/kg/day)^-1 | LIVECHEM |
| Oral Wt-of-Evid: | B2 | | LIVECHEM |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | 4.0E-03 | mg/kg/day | EPA_ED10 |
| Oral ED10 Wgt: | B2 | | EPA_ED10 |
| Inhal ED10: | 4.0E-03 | mg/kg/day | EPA_ED10 |
| Inhal ED10 Wgt: | B2 | | EPA_ED10 |
| Oral LD50: | | mg/kg | |
| Dermal LD50: | | mg/kg | |
| Gas Inhal LC50: | | ppm | |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Fresh Ecol LC50: | | µg/L | |
| Salt Ecol LC50: | | µg/L | |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | Yes |
| Particulate: | Yes |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 2.52E+02 |
| Density: | |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 5.0E-07 | Torr | CHEMFATE |
| Henry's Law: | 1.1E-04 | atm-m3/mol | CHEMFATE |
| Water Solub: | 1.5E-03 | mg/L | CHEMFATE |
| Distrib Coef: | 2.5E+03 | ml/g | |
| Geo. Mean Sol.: | | | |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.4E+02 | days | THOMAS |
| Photolysis: | 3.0E+01 | days | FATERATE |
| Biodeg: | 6.1E+02 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.9E+00 | days | THOMAS |
| Photolysis: | 3.0E+01 | days | FATERATE |
| Biodeg: | 6.1E+02 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 6.2E+00 | | RTI_LOGP |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| ENVIRONMENTAL | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| Log Kow: | 6.2E+00 | | RTI_LOGP |
| Water Solub: | 1.5E-03 | mg/L | CHEMFATE |

## OTHER DATA

Melting Point :168.00° C
Boiling Point :
Formula :C20 H12

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Gas Mobility: | 0.0020 |
| Gas Migration: | 6 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Water Solub: | 1.5E-03 |
| Distrib: | 2.5E+03 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 50000.0 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | ... |
| Salt Tox: | ... |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 50000.0 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | 1.2E-04 | mg/L |
| Non Cancer Risk: | | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | 8.8E-01 | mg/kg |
| Non Cancer Risk: | | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | 1.2E-04 | mg/L |
| Non Cancer Risk: | | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | 4.3E-03 | mg/kg |
| Non Cancer Risk: | | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | | mg/kg/day | |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | | (mg/kg/day)^-1 | |
| Oral Wt-of-Evid: | | | |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | | mg/kg/day | |
| Oral ED10 Wgt: | | | |
| Inhal ED10: | | mg/kg/day | |
| Inhal ED10 Wgt: | | | |
| Oral LD50: | | mg/kg | |
| Dermal LD50: | | mg/kg | |
| Gas Inhal LC50: | | ppm | |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Ecol LC50: | | µg/L | |
| Salt Ecol LC50: | | µg/L | |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 4.6E+02 | days | THOMAS |
| Photolysis: | | days | |
| Biodeg: | 6.5E+02 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 2.9E+02 | days | THOMAS |
| Photolysis: | | days | |
| Biodeg: | 6.5E+02 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 6.7E+00 | | RTI_LOGP |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | No |
| Particulate: | Yes |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 2.76E+02 |
| Density: | |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 1.0E-10 | Torr | CHEMFATE |
| Henry's Law: | 1.4E-07 | atm-m3/mol | CHEMFATE |
| Water Solub: | 2.6E-04 | mg/L | CHEMFATE |
| Distrib Coef: | 7.7E+03 | ml/g | |
| Geo. Mean Sol.: | | | |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| ENVIRONMENTAL | | | |
| Fresh BCF: | 2.8E+04 | | AQUIRE |
| Salt BCF: | | | |
| Log Kow: | 6.7E+00 | | RTI_LOGP |
| Water Solub: | 2.6E-04 | mg/L | CHEMFATE |

## OTHER DATA

Melting Point :
Boiling Point :
Formula :C22H12

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | ... |
| Gas Mobility: | 0.0000 |
| Gas Migration: | 0 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | ... |
| Water Solub: | 2.6E-04 |
| Distrib: | 7.7E+03 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | ... |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | ... |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | ... |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 50000.0 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | ... |
| Salt Tox: | ... |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 50000.0 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | | mg/kg/day | |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | 7.3E-02 | (mg/kg/day)^-1 | LIVECHEM |
| Oral Wt-of-Evid: | B2 | | LIVECHEM |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | | mg/kg/day | |
| Oral ED10 Wgt: | | | |
| Inhal ED10: | | mg/kg/day | |
| Inhal ED10 Wgt: | | | |
| Oral LD50: | | mg/kg | |
| Dermal LD50: | | mg/kg | |
| Gas Inhal LC50: | | ppm | |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Ecol LC50: | | µg/L | |
| Salt Ecol LC50: | | µg/L | |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | Yes |
| Particulate: | Yes |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 2.52E+02 |
| Density: | |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 2.0E-09 | Torr | CHEMFATE |
| Henry's Law: | 8.3E-07 | atm-m3/mol | CHEMFATE |
| Water Solub: | 8.0E-04 | mg/L | CHEMFATE |
| Distrib Coef: | 2.5E+03 | ml/g | |
| Geo. Mean Sol.: | | | |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.9E+02 | days | THOMAS |
| Photolysis: | 2.1E+01 | days | FATERATE |
| Biodeg: | 2.1E+03 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 4.8E+01 | days | THOMAS |
| Photolysis: | 2.1E+01 | days | FATERATE |
| Biodeg: | 2.1E+03 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 6.2E+00 | | RTI_LOGP |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| ENVIRONMENTAL | | | |
| Fresh BCF: | 1.3E+04 | | AQUIRE |
| Salt BCF: | | | |
| Log Kow: | 6.2E+00 | | RTI_LOGP |
| Water Solub: | 8.0E-04 | mg/L | CHEMFATE |

## OTHER DATA

Melting Point :217.00° C
Boiling Point :480.00° C
Formula :C20H12

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Gas Mobility: | 0.0002 |
| Gas Migration: | 6 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Water Solub: | 8.0E-04 |
| Distrib: | 2.5E+03 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 100 |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 50000.0 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | ... |
| Salt Tox: | ... |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 50000.0 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | 1.2E-03 | mg/L |
| Non Cancer Risk: | | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | 8.8E+00 | mg/kg |
| Non Cancer Risk: | | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | 1.2E-03 | mg/L |
| Non Cancer Risk: | | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | 4.3E-02 | mg/kg |
| Non Cancer Risk: | | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | | mg/kg/day | |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | 7.3E-03 | (mg/kg/day)^-1 | LIVECHEM |
| Oral Wt-of-Evid: | B2 | | LIVECHEM |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | | mg/kg/day | |
| Oral ED10 Wgt: | | | |
| Inhal ED10: | | mg/kg/day | |
| Inhal ED10 Wgt: | | | |
| Oral LD50: | | mg/kg | |
| Dermal LD50: | | mg/kg | |
| Gas Inhal LC50: | | ppm | |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Ecol LC50: | | µg/L | |
| Salt Ecol LC50: | 1.0E+03 | µg/L | AQUIRE |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | Yes |
| Particulate: | Yes |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 2.28E+02 |
| Density: | 1.3E+00 g/mL @ 20.00° C |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 6.2E-09 | Torr | CHEMFATE |
| Henry's Law: | 9.5E-05 | atm-m3/mol | CHEMFATE |
| Water Solub: | 1.6E-03 | mg/L | LIVECHEM |
| Distrib Coef: | 8.0E+02 | ml/g | |
| Geo. Mean Sol.: | | | |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.3E+02 | days | THOMAS |
| Photolysis: | 5.4E-01 | days | FATERATE |
| Biodeg: | 1.0E+03 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.8E+00 | days | THOMAS |
| Photolysis: | 5.4E-01 | days | FATERATE |
| Biodeg: | 1.0E+03 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 5.7E+00 | | RTI_LOGP |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | | | |
| Salt BCF: | 3.7E+02 | | VER_BCF |
| ENVIRONMENTAL | | | |
| Fresh BCF: | 6.1E+03 | | AQUIRE |
| Salt BCF: | 3.7E+02 | | VER_BCF |
| Log Kow: | 5.7E+00 | | RTI_LOGP |
| Water Solub: | 1.6E-03 | mg/L | LIVECHEM |

## OTHER DATA

Melting Point :258.20° C
Boiling Point :448.00° C
Formula :C18 H12

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Gas Mobility: | 0.0002 |
| Gas Migration: | 6 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Water Solub: | 1.6E-03 |
| Distrib: | 8.0E+02 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 10 |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | 10 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 500.0 |
| Salt: | 500.0 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | 1000 |
| Salt Tox: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 5000.0 |
| Salt: | 500.0 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | 1.2E-02 | mg/L |
| Non Cancer Risk: | | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | 8.8E+01 | mg/kg |
| Non Cancer Risk: | | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | 1.2E-02 | mg/L |
| Non Cancer Risk: | | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | 4.3E-01 | mg/kg |
| Non Cancer Risk: | | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | 4.0E-02 | mg/kg/day | IRIS |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | | (mg/kg/day)^-1 | |
| Oral Wt-of-Evid: | | | |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | | mg/kg/day | |
| Oral ED10 Wgt: | | | |
| Inhal ED10: | | mg/kg/day | |
| Inhal ED10 Wgt: | | | |
| Oral LD50: | 2.0E+03 | mg/kg | RTECS |
| Dermal LD50: | 3.2E+03 | mg/kg | RTECS |
| Gas Inhal LC50: | | ppm | |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Ecol LC50: | 3.6E+01 | µg/L | AQUIRE |
| Salt Ecol LC50: | 5.0E+02 | µg/L | AQUIRE |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.3E+02 | days | THOMAS |
| Photolysis: | 2.6E+00 | days | FATERATE |
| Biodeg: | 4.4E+02 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 3.5E+00 | days | THOMAS |
| Photolysis: | 2.6E+00 | days | FATERATE |
| Biodeg: | 4.4E+02 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 5.1E+00 | | RTI_LOGP |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | Yes |
| Particulate: | Yes |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 2.02E+02 |
| Density: | 1.3E+00 g/mL @ 0.00° C |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 7.8E-06 | Torr | LIVECHEM |
| Henry's Law: | 1.6E-05 | atm-m3/mol | CHEMFATE |
| Water Solub: | 2.1E-01 | mg/L | CHEMFATE |
| Distrib Coef: | 2.2E+02 | ml/g | |
| Geo. Mean Sol.: | | | |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | | | |
| Salt BCF: | 5.9E+03 | | AQUIRE |
| ENVIRONMENTAL | | | |
| Fresh BCF: | 3.8E+02 | | VER_BCF |
| Salt BCF: | 5.9E+03 | | AQUIRE |
| Log Kow: | 5.1E+00 | | RTI_LOGP |
| Water Solub: | 2.1E-01 | mg/L | CHEMFATE |

## OTHER DATA

Melting Point :107.80° C
Boiling Point :384.00° C
Formula :C16 H10

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Gas Mobility: | 0.0020 |
| Gas Migration: | 6 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Water Solub: | 2.1E-01 |
| Distrib: | 2.2E+02 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 100 |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 5000.0 |
| Salt: | 5000.0 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | 10000 |
| Salt Tox: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 500.0 |
| Salt: | 5000.0 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | 1.5E+00 | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | 3.1E+03 | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | 1.5E+00 | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | 5.4E+01 | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | | mg/kg/day | |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | 7.3E-01 | (mg/kg/day)^-1 | LIVECHEM |
| Oral Wt-of-Evid: | B2 | | LIVECHEM |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | | mg/kg/day | |
| Oral ED10 Wgt: | | | |
| Inhal ED10: | | mg/kg/day | |
| Inhal ED10 Wgt: | | | |
| Oral LD50: | | mg/kg | |
| Dermal LD50: | | mg/kg | |
| Gas Inhal LC50: | | ppm | |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Fresh Ecol LC50: | | µg/L | |
| Salt Ecol LC50: | | µg/L | |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.7E+02 | days | THOMAS |
| Photolysis: | 2.5E+02 | days | FATERATE |
| Biodeg: | 7.3E+02 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 2.7E+01 | days | THOMAS |
| Photolysis: | 2.5E+02 | days | FATERATE |
| Biodeg: | 7.3E+02 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 6.7E+00 | | RTI_LOGP |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | No |
| Particulate: | Yes |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 2.76E+02 |
| Density: | |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 1.0E-10 | Torr | CHEMFATE |
| Henry's Law: | 1.6E-06 | atm-m3/mol | CHEMFATE |
| Water Solub: | 2.2E-05 | mg/L | CHEMFATE |
| Distrib Coef: | 6.9E+03 | ml/g | |
| Geo. Mean Sol.: | | | |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| ENVIRONMENTAL | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| Log Kow: | 6.7E+00 | | RTI_LOGP |
| Water Solub: | 2.2E-05 | mg/L | CHEMFATE |

## OTHER DATA

Melting Point :161.50° C
Boiling Point :536.00° C
Formula :C22 H12

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Gas Mobility: | 0.0000 |
| Gas Migration: | 0 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Water Solub: | 2.2E-05 |
| Distrib: | 6.9E+03 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 50000.0 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | ... |
| Salt Tox: | ... |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50000.0 |
| Salt: | 50000.0 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | 1.2E-04 | mg/L |
| Non Cancer Risk: | | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | 8.8E-01 | mg/kg |
| Non Cancer Risk: | | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | 1.2E-04 | mg/L |
| Non Cancer Risk: | | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | 4.3E-03 | mg/kg |
| Non Cancer Risk: | | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | | mg/kg/day | |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | | (mg/kg/day)^-1 | |
| Oral Wt-of-Evid: | | | |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | | mg/kg/day | |
| Oral ED10 Wgt: | | | |
| Inhal ED10: | | mg/kg/day | |
| Inhal ED10 Wgt: | | | |
| Oral LD50: | | mg/kg | |
| Dermal LD50: | | mg/kg | |
| Gas Inhal LC50: | | ppm | |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Fresh Ecol LC50: | 1.0E+02 | µg/L | AQUIRE |
| Salt Ecol LC50: | 6.0E+02 | µg/L | AQUIRE |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.2E+02 | days | THOMAS |
| Photolysis: | 1.0E+00 | days | FATERATE |
| Biodeg: | 2.0E+02 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 2.7E+00 | days | THOMAS |
| Photolysis: | 1.0E+00 | days | FATERATE |
| Biodeg: | 2.0E+02 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 4.6E+00 | | RTI_LOGP |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | Yes |
| Particulate: | Yes |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 1.78E+02 |
| Density: | 9.8E-01 g/mL @ 4.00° C |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 1.1E-04 | Torr | CHEMFATE |
| Henry's Law: | 2.3E-05 | atm-m3/mol | CHEMFATE |
| Water Solub: | 1.2E+00 | mg/L | CHEMFATE |
| Distrib Coef: | 5.9E+01 | ml/g | |
| Geo. Mean Sol.: | | | |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | | | |
| Salt BCF: | 3.2E+01 | | VER_BCF |
| ENVIRONMENTAL | | | |
| Fresh BCF: | 5.1E+03 | | AQUIRE |
| Salt BCF: | 3.2E+01 | | VER_BCF |
| Log Kow: | 4.6E+00 | | RTI_LOGP |
| Water Solub: | 1.2E+00 | mg/L | CHEMFATE |

## OTHER DATA

Melting Point :99.20° C
Boiling Point :340.00° C
Formula :C14 H10

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | ... |
| Gas Mobility: | 0.0200 |
| Gas Migration: | 11 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | ... |
| Water Solub: | 1.2E+00 |
| Distrib: | 5.9E+01 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | ... |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | ... |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | ... |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50.0 |
| Salt: | 50.0 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | 1000 |
| Salt Tox: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 5000.0 |
| Salt: | 50.0 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | 3.0E-02 | mg/kg/day | IRIS |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | | (mg/kg/day)^-1 | |
| Oral Wt-of-Evid: | | | |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | | mg/kg/day | |
| Oral ED10 Wgt: | | | |
| Inhal ED10: | | mg/kg/day | |
| Inhal ED10 Wgt: | | | |
| Oral LD50: | | mg/kg | |
| Dermal LD50: | | mg/kg | |
| Gas Inhal LC50: | | ppm | |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Fresh Ecol LC50: | 3.5E+01 | µg/L | AQUIRE |
| Salt Ecol LC50: | 9.9E+01 | µg/L | AQUIRE |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | Yes |
| Particulate: | Yes |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 2.02E+02 |
| Density: | 1.3E+00 g/mL @ 23.00° C |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 4.6E-06 | Torr | CHEMFATE |
| Henry's Law: | 1.1E-05 | atm-m3/mol | CHEMFATE |
| Water Solub: | 1.4E-01 | mg/L | FATE |
| Distrib Coef: | 2.1E+02 | ml/g | |
| Geo. Mean Sol.: | | | |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | 6.9E+01 | | VER_BCF |
| Salt BCF: | 4.4E+03 | | AQUIRE |
| ENVIRONMENTAL | | | |
| Fresh BCF: | 6.9E+01 | | VER_BCF |
| Salt BCF: | 6.4E+03 | | AQUIRE |
| Log Kow: | 5.1E+00 | | RTI_LOGP |
| Water Solub: | 1.4E-01 | mg/L | FATE |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 1.3E+02 | days | THOMAS |
| Photolysis: | 8.5E-02 | days | FATERATE |
| Biodeg: | 1.9E+03 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 4.5E+00 | days | THOMAS |
| Photolysis: | 8.5E-02 | days | FATERATE |
| Biodeg: | 1.9E+03 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 5.1E+00 | | RTI_LOGP |

## OTHER DATA

Melting Point :151.20° C
Boiling Point :404.00° C
Formula :C16 H10

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Gas Mobility: | 0.0020 |
| Gas Migration: | 6 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Water Solub: | 1.4E-01 |
| Distrib: | 2.1E+02 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 100 |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | 100 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50.0 |
| Salt: | 5000.0 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | 10000 |
| Salt Tox: | 10000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 1.0000 |
| Bioaccumulation | |
| Fresh: | 50.0 |
| Salt: | 5000.0 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | 1.1E+00 | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | 2.3E+03 | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | 1.1E+00 | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | 4.1E+01 | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

## TOXICITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Oral RfD: | 1.0E-03 | mg/kg/day | IRIS |
| Inhal RfD: | | mg/kg/day | |
| Oral Slope: | | (mg/kg/day)^-1 | |
| Oral Wt-of-Evid: | | | |
| Inhal Slope: | | (mg/kg/day)^-1 | |
| Inhal Wt-of-Evid: | | | |
| Oral ED10: | | mg/kg/day | |
| Oral ED10 Wgt: | | | |
| Inhal ED10: | | mg/kg/day | |
| Inhal ED10 Wgt: | | | |
| Oral LD50: | 8.9E-01 | mg/kg | ACGIH |
| Dermal LD50: | 1.1E+03 | mg/kg | RTECS |
| Gas Inhal LC50: | 9.0E+03 | ppm | ACGIH |
| Dust Inhal LC50: | | mg/L | |
| ACUTE | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| CHRONIC | | | |
| Fresh AWQC: | | µg/L | |
| Salt AWQC: | | µg/L | |
| Fresh AALAC: | | µg/L | |
| Salt AALAC: | | µg/L | |
| Ecol LC50: | 1.1E+03 | µg/L | AQUIRE |
| Salt Ecol LC50: | 5.0E+04 | µg/L | AQUIRE |

## PERSISTENCE

| Parameter | Value | Unit | Source |
|---|---|---|---|
| LAKE - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 8.1E+01 | days | THOMAS |
| Photolysis: | | days | |
| Biodeg: | 7.0E+00 | days | FATERATE |
| Radio: | | days | |
| RIVER - Halflives | | | |
| Hydrolysis: | | days | |
| Volatility: | 3.3E+00 | days | THOMAS |
| Photolysis: | | days | |
| Biodeg: | 7.0E+00 | days | FATERATE |
| Radio: | | days | |
| Log Kow: | 6.7E-01 | | RTI_LOGP |

## PHYSICAL CHARACTERISTICS

| Parameter | Value |
|---|---|
| Metal Contain: | No |
| Organic: | Yes |
| Inorganic: | No |
| Gas: | Yes |
| Particulate: | No |
| Radionuclide: | No |
| Rad. Element: | No |
| Molecular Weight: | 7.91E+01 |
| Density: | 9.8E-01 g/mL @ 20.00° C |

## MOBILITY

| Parameter | Value | Unit | Source |
|---|---|---|---|
| Vapor Press: | 2.1E+01 | Torr | CHEMFATE |
| Henry's Law: | 8.9E-06 | atm-m3/mol | CHEMFATE |
| Water Solub: | 1.0E+06 | mg/L | CHEMFATE |
| Distrib Coef: | 9.1E-03 | ml/g | |
| Geo. Mean Sol.: | | | |

## BIOACCUMULATION

| Parameter | Value | Unit | Source |
|---|---|---|---|
| FOOD CHAIN | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| ENVIRONMENTAL | | | |
| Fresh BCF: | | | |
| Salt BCF: | | | |
| Log Kow: | 6.7E-01 | | RTI_LOGP |
| Water Solub: | 1.0E+06 | mg/L | CHEMFATE |

## OTHER DATA

Melting Point :-41.60° C
Boiling Point :115.20° C
Formula :C5 H5 N

## CLASS INFORMATION

| Class | Parent Substance |
|---|---|
| Toxicity: | NA |
| GW Mob: | NA |
| Other: | NA |

## ASSIGNED FACTOR VALUES

### AIR PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Gas Mobility: | 1.0000 |
| Gas Migration: | 11 |

### GROUND WATER PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Water Solub: | 1.0E+06 |
| Distrib: | 9.1E-03 |

### SOIL EXPOSURE PATHWAY

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 0.4000 |

#### Human Food Chain

| Parameter | Value |
|---|---|
| Toxicity: | 1000 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 0.4000 |
| Bioaccumulation | |
| Fresh: | 0.5 |
| Salt: | 0.5 |

#### Environmental

| Parameter | Value |
|---|---|
| Fresh Tox: | 100 |
| Salt Tox: | 10 |
| Persistence | |
| River: | 1.0000 |
| Lake: | 0.4000 |
| Bioaccumulation | |
| Fresh: | 0.5 |
| Salt: | 0.5 |

## BENCHMARKS

### AIR PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| NAAQS/NESHAPS: | | µg/m3 |
| Cancer Risk: | | mg/m3 |
| Non Cancer Risk: | | mg/m3 |

### GROUND WATER PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | 3.7E-02 | mg/L |

### SOIL EXPOSURE PATHWAY

| Parameter | Value | Unit |
|---|---|---|
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | 7.8E+01 | mg/kg |

### RADIONUCLIDE

| Parameter | Value | Unit |
|---|---|---|
| MCL: | | pCi/L |
| UMTRCA: | | pCi/kg |
| CANCER RISK | | |
| Air: | | pCi/m3 |
| DW: | | pCi/L |
| FC: | | pCi/kg |
| Soil Ing: | | pCi/kg |
| Soil Gam: | | pCi/kg |

### SURFACE WATER PATHWAY

#### Drinking Water

| Parameter | Value | Unit |
|---|---|---|
| MCL/MCLG: | | mg/L |
| Cancer Risk: | | mg/L |
| Non Cancer Risk: | 3.7E-02 | mg/L |

#### Human Food Chain

| Parameter | Value | Unit |
|---|---|---|
| FDAAL: | | ppm |
| Cancer Risk: | | mg/kg |
| Non Cancer Risk: | 1.4E+00 | mg/kg |

#### Environmental

| Parameter | Value | Unit |
|---|---|---|
| ACUTE | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |
| CHRONIC | | |
| Fresh AWQC: | | µg/L |
| Salt AWQC: | | µg/L |
| Fresh AALAC: | | µg/L |
| Salt AALAC: | | µg/L |

# Appendix G: Site Inspection Photographs

# UNSCANNABLE

# MEDIA

# (PHOTOGRAPHS)

Georgia Department of Natural Resources

205 Butler Street, S.E., East Floyd Tower, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Harold F. Reheis, Director
Environmental Protection Division
(404) 656-4713

Reply To:
Georgia Geologic Survey
Room 400
19 Martin Luther King Jr. Drive, S.W.
(404) 656-3214

**MEMORANDUM**

September 12, 1997

To: William H. McLemore
State Geologist

From: Roger Carter
Regulatory Program Manager

James S. Guentert
Geologist

Larry Papetti
Geologist

Subject: Fort Valley Phase I Investigation Plan

The purpose of the Phase I investigation is to: (1) gain a better understanding of the hydrogeology and geology, (2) evaluate the perched and water table aquifer groundwater quality in the vicinity of City to both identify potential PCE sources and to allow deeper drilling and (3) evaluate the depths at which contaminants are entering City Well 1 and City Well 2. The following three tasks have been designed to achieve these objectives.

**Task I - Monitoring Well Installation and Sampling**

Monitoring wells are proposed to be installed at five locations in Ft. Valley in the general vicinity of city wells 1,2, and 5 as shown on Figure 1. Monitoring wells will be installed in streets in Ft Valley, because of insufficient right-of-way width along the streets, presence of above and below ground utilities, and inherent problems with obtaining permission and drilling on private property The City of Fort Valley has agreed that three monitoring well locations can be in Central Street and one in College Street. The fifth monitoring well location will be in State Highway 49, if permission is granted from the Georgia Department of Transportation.

Drilling Methods and Well Construction

Monitoring wells will be installed in the water table aquifer, which is anticipated to be

encountered at a depth of 100 - 120 feet. A shallow monitoring well will also be installed and sampled at each location, prior to drilling deeper, if a perched water bearing zone is encountered. A perched zone has been identified in this area above a kaolinite layer at a depth of 40 - 50 feet below ground level. A maximum of two monitoring wells at each of the five locations will be installed during this Phase I Investigation.

A hand auger will be used to dig to a depth of four feet at each location prior to drilling. The boreholes will be advanced using 4 1/4-inch I.D. hollow stem augers. Monitoring wells will be constructed with 2-inch diameter PVC casing and either 5-foot or 10-foot slotted screens. The annular space between the screen and borehole will be filled with an appropriately sized silica sand from the base of the borehole to approximately 2-feet above the top of the screen. A minimum 2-foot thick layer of bentonite hole plug will be placed above the sandpack. The remaining annular space will be filled with a cement-bentonite slurry grouted, pumped through a tremie pipe from the top of the hole plug layer to the ground surface.

An 8 1/4-inch diameter PVC surface casing will be installed, prior to drilling to the water table, at locations where a perched groundwater zone is encountered. The surface casing will be installed no closer than 5-feet from the perched groundwater monitoring well. Surface casings, where needed, will be installed by drilling 2-3 feet into the underlying kaolinite layer (approximately 50 feet) with 11 1/4-inch O.D hollow stem augers. The augers will then be removed, and the PVC casing installed in the open borehole. The annular space will be filled with a cement slurry grout from the base of the borehole to surface. The cement will be allowed to cure for at least 24 hours, before advancing 4 1/4-inch ID augers through the PVC surface casing to the water table. A monitoring well with a 10-foot screen will be installed in the upper portion of the water table as described above.

Monitoring wells will either be developed by hand bailing or through the use of a 2-inch diameter variable-flow submersible pump. Development water will be containerized in drums for later disposal.

Monitoring wells will be fitted with a locking, water-tight cap and completed with a flush-mounted, traffic-rated cover which is cemented in place.

Monitoring Well Surveying

Monitoring well locations and top-of-casing measuring points will be determined by a registered land surveyor. Top-of-casing measuring points will be determined to an accuracy of 0.01 feet and referenced to NGVD.

Soil Sampling and Analysis

Continuous soil cores will be collected using either a split core-barrel sampler, or split-spoon sampler. Grab samples will be collected from the cores at 2.5-foot intervals for field PID screening and/or laboratory analyses. One half of each soil grab sample will immediately be

placed in a ziplock bag, and screened for organic vapors in the field using a PID. The second half of each soil grab sample will immediately be placed in a soil jar and kept on ice for possible laboratory analysis. Soil samples for which PID readings above background values are obtained will be sent for laboratory analysis by EPA Method 502.2 (which includes PCE as a parameter). Otherwise, the deepest unsaturated soil sample will be sent for laboratory analysis. Additionally, a soil sample from the bottom of each boring (whether saturated or unsaturated) will be collected and analyzed by EPA Method 8260

Augers, drill rods, and soil sampling devices will be steam-decontaminated prior to drilling each well. Prior to collection of each soil sample within a boring, the sampling device will be scrubbed with a liquinox-water solution, rinsed with tap water, sprayed with isopropanol, and given a final rinse with distilled water.

At least one equipment rinseate blank will be collected per boring for soil sampling equipment. The equipment rinseate blank will be collected by pouring distilled water into the sample bottle through the decontaminated sampling device to be used for the first sample in each boring. The equipment rinseate blank will be analyzed by EPA Method 502.2.

Groundwater Sampling and Analysis

A new disposable teflon bailer will be used for each well. New disposable, powder-free latex gloves will be worn during sampling activities.

At least 3 well volumes of water will be purged from each monitoring well prior to sampling. During purging, pH, conductivity, and temperature will be monitored. If pH, temperature, and conductivity have not stabilized by the third well volume, purging will continue until the measurements have stabilized, or 5 well volumes have been removed.

Groundwater samples will be collected, and analyzed for volatile organic compounds (VOCs) by EPA Method 502.2 (the standard drinking-water analysis for VOCs). Immediately after collection, groundwater samples will be placed on ice. Quality assurance samples will include one field duplicate (split of one groundwater sample), one bailer rinseate blank (obtained by pouring distilled water through a clean bailer prior to use in a well), and one travel blank (sample of distilled water prepared by the laboratory to accompany sample bottles during transport) per sampling event. During the sampling event, monitoring wells with previously-confirmed contamination, or with suspected contamination (odor, etc.) will be sampled subsequently to wells expected to be clean.

Development water from all wells not previously shown to be clean will be contained in D.O.T.-compliant, properly labeled drums, and stored on fenced City of Ft. Valley property until analytical results are obtained. Contaminated development water will then either be disposed of by permitted, licensed contractors or discharged to the city sewer system.

Drill Cuttings and Fluids

Investigation derived soils and water will be handled in general accordance with the attached Investigation Derived Waste (IDW) Management Plan.

Drill cuttings and drilling mud will be staged at each location on plastic, awaiting transportation to a centrally located, lined roll-off box. The roll-off box will be kept in the fenced and locked municipal garage compound and will be covered with a plastic tarp. Liquids which may accumulate after the drilling mud has settled will be pumped off periodically into 55-gallon, steel drums. If determined to be non-hazardous the roll-off box will be transported to a Subtitle D landfill for disposal.

Sampling purge water and development water will be collected from each well in a separate 55-gallon, steel drum. Depending on the analytical results and levels of contaminants the water may be discharged to the City of Ft. Valley sewer system or disposed of at a licensed and permitted waste management facility.

**Task II - Gamma Ray Logging**

City well 1 and 2 and the deepest monitoring well installed by EPD at each location will be gamma ray logged using the Georgia Geologic Survey's logging van and equipment. Logging the city wells is dependant on the Fort Valley Utility Commission contracting the removal of the pumps and associated pipe and any residual lubricant oil floating on the water surface.

**Task III - Screened Interval Sampling**

Discreet groundwater samples will be collected from each screened interval in City Wells 1 and 2. The success of this task will be dependant on how accurately the screened intervals in each well can be identified. Historic downhole television logs in combination with driller's logs from City Well 1 and 2 will be used to identify the screened intervals. It is anticipated that 3-5 samples will be collected from each well.

Groundwater samples will be collected using a low-flow sampling pump, positioned in the middle of each screened interval. More than one sample may be collected in screened intervals greater than 20 feet long. The groundwater pH, temperature and conductivity will be carefully monitored to assist in collecting a groundwater sample representative of the formation quality at that depth. with minimal input form water stored within the gravel pack or stagnant water within the casing The pump that will be utilized is a nitrogen-operated, bladder pump capable of collecting groundwater samples from as deep as 1000 feet below ground level. If successful, this technique should give some indication of the depths where contaminated groundwater is entering the city wells. An added benefit of low-flow sampling is that the volume of purge water is minimized. Purge water from each interval will be containerized separately and disposed of based on the laboratory analytical results.

Groundwater samples collected from the screened intervals will be analyzed for volatile organic compounds, total metals, pesticides and herbicides.

# ATTACHMENT

## CONSIDERATIONS FOR MANAGING INVESTIGATION DERIVED WASTES

This plan addresses management of investigation derived waste (IDW) associated with investigative activities to be performed by the GGS Field Team. Wastes of concern include drill cuttings and mud, development/purge water from monitoring wells, contaminated personnel protective equipment (gloves, etc), sampling equipment (bailers, etc), drilling equipment (augers, etc), and soil and groundwater samples themselves.

In Particular, the following three EPA documents were reviewed in plan preparation:

- a quick reference Fact Sheet entitled *Guide to Management of Investigation-Derived Wastes* (January 1992), Publication 9345.3-03FS;
- a Region IV internal guidance memorandum TSC-92-02 entitled *Management of Contaminated Media* (December 28, 1992); and
- Section 5.15 (entitled *Investigation Derived Waste*) of the *Standard Operating Procedures-Quality Assurance Manual* (May 1996).

The following USTMP documents were also reviewed:

- *Petroleum Contaminated soil Disposal/Treatment—Guidance Document* (8/95, GUST-39); and
- *So You Want To Close An UST?—Petroleum Releases* (8/95, GUST-9).

**IDW Potentially Contaminated by a Listed or Characteristic Hazardous Waste, or by Petroleum from a Non-Exempted Source**

The *Decision Matrix for Managing Contaminated Media*, which is included in the December 28, 1992 EPA Region IV guidance memorandum, should be applied to IDWs which are potentially hazardous or non-exempted wastes. Accordingly, if an IDW is not suspected of being contaminated, or has been shown to be non-contaminated, then best management practices apply. For instance, non-contaminated or decontaminated soil, drilling mud, or development/purge water might be disposed of on the ground in the vicinity of the boring or well from which it was derived. Non-contaminated or decontaminated personnel protective equipment and sampling equipment should be disposed of in an ordinary household (Subtitle D) garbage recepticle such as a city dumpster.

IDW suspected or known to be contaminated by hazardous or non-exempted petroleum wastes should be managed as follows:

Drill cuttings and mud, decontamination fluids, and well development/purge water should be contained in drums or appropriate containers until analytical results are obtained. Containers and drums should be segregated by well/boring location in order to minimize the volume of contaminated media. The drums or containers should be temporarily labelled with drum markers identifying their contents, generator name and address, and date. If soil or groundwater analytical results indicate that the contained IDW might be contaminated by a hazardous or non-exempted petroleum waste, then a TCLP test should be run on the drum/container contents to determine if it is a characteristic waste.

If TCLP analysis indicates that the drum/container contents are non-hazardous and non-contaminated, then the IDW should be disposed of by spreading onsite as described in the first paragraph of this section. If the contents pass the TCLP test (are non-hazardous), but are still contaminated above detection limits, then the drum/container should be labelled with an EPA/DOT compliant non-hazardous waste sticker, and the contents either disposed of in a RCRA Subtitle D Municipal Solid Waste Landfill, soil treatment (recovered materials) facility, or other licensed facility; or managed according to best management practices. Best management practices for contaminated, non-hazardous soil might consist of decontaminating soil onsite (ie spreading soil out on plastic sheeting, and allowing it to volatilize in the sun) and subsequent onsite disposal. If the drum/container contents fail the TCLP test, they should be labelled with an EPA/DOT-compliant hazardous waste sticker, and properly manifested and disposed of as a hazardous waste by a licensed waste hauler.

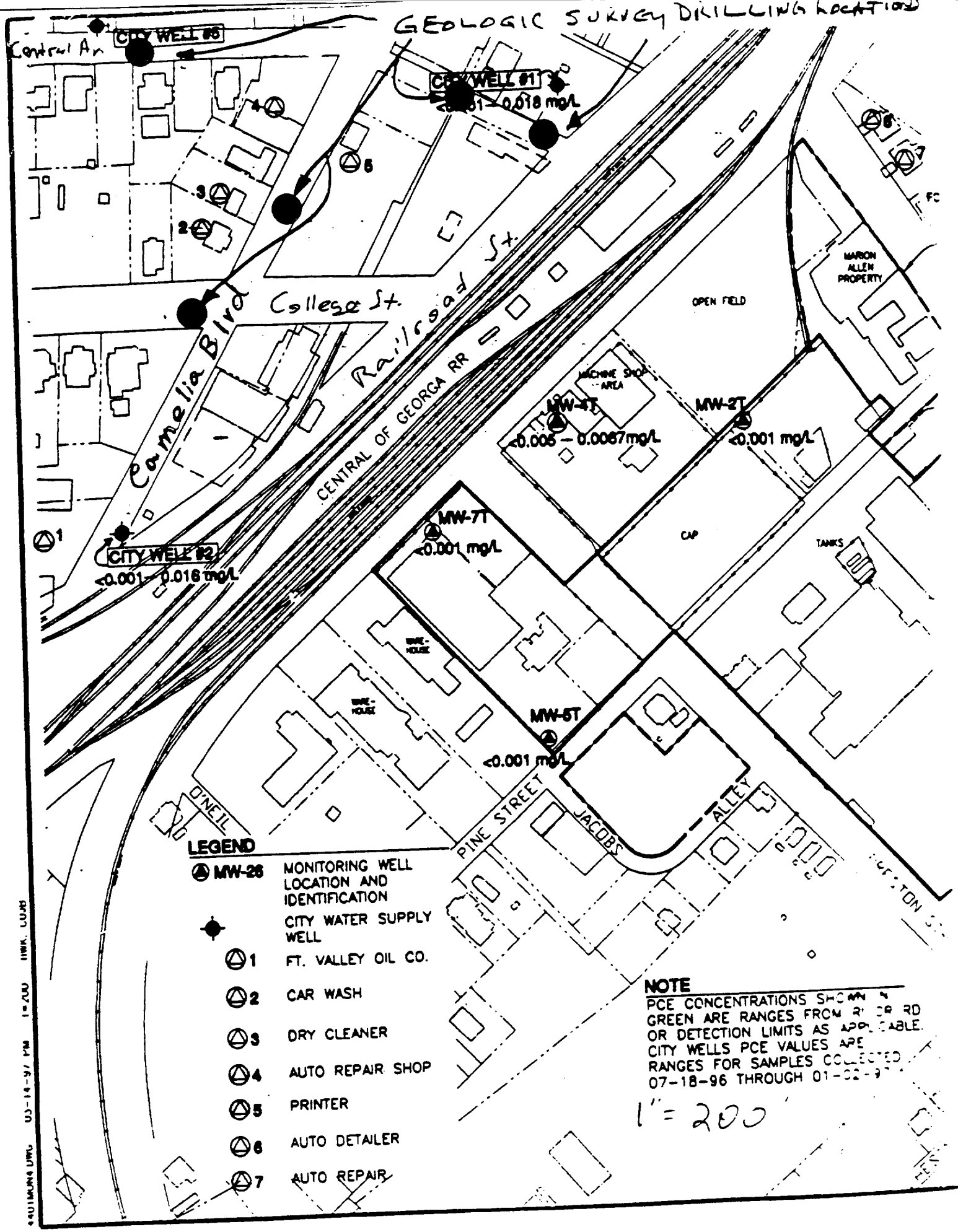
An exclusion is provided in *40 CFR Section 261.4(d)* for soil and groundwater samples in the process of being analyzed, or being transported for analysis. After analysis, the samples, if hazardous, will be properly disposed of by the EPD laboratories.

**IDW Potentially Contaminated by Petroleum from a Regulated UST Source**

We recommend that IDWs suspected of being contaminated by petroleum from a regulated UST source be managed according to GUST guidelines. Sampling equipment and PPE should be decontaminated onsite, and disposed of in a Subtitle D facility. Groundwater suspected of being contaminated should be drummed/containerized and labelled as described in the previous section. Soil suspected of being contaminated should be stockpiled on an inpermeable surface (ie concrete or asphalt), and enveloped in plastic sheeting unless it contains free product, in which case it should be drummed. If soil and/or groundwater analytical results indicate that the drummed/containerized/stockpiled IDW is likely to be contaminated, then it should be sampled for the suspected petroleum compounds. If sampling indicates that the IDW is clean, then it can be disposed of onsite as described in the previous section. If the soil is determined to be contaminated with petroleum from a regulated UST source, then it should be disposed of in a Municipal Solid Waste Landfill, or soil treatment (recovered materials) facility according to the GUST guidance document: *Petroleum Contaminated Soil Disposal/Treatment*.
Drummed/contained groundwater which is contaminated by petroleum from a regulated UST

source but is non-hazardous, should be labelled as non-hazardous with an appropriate sticker, and disposed of by a licensed waste disposal facility.

GEOLOGIC SURVEY DRILLING LOCATIONS



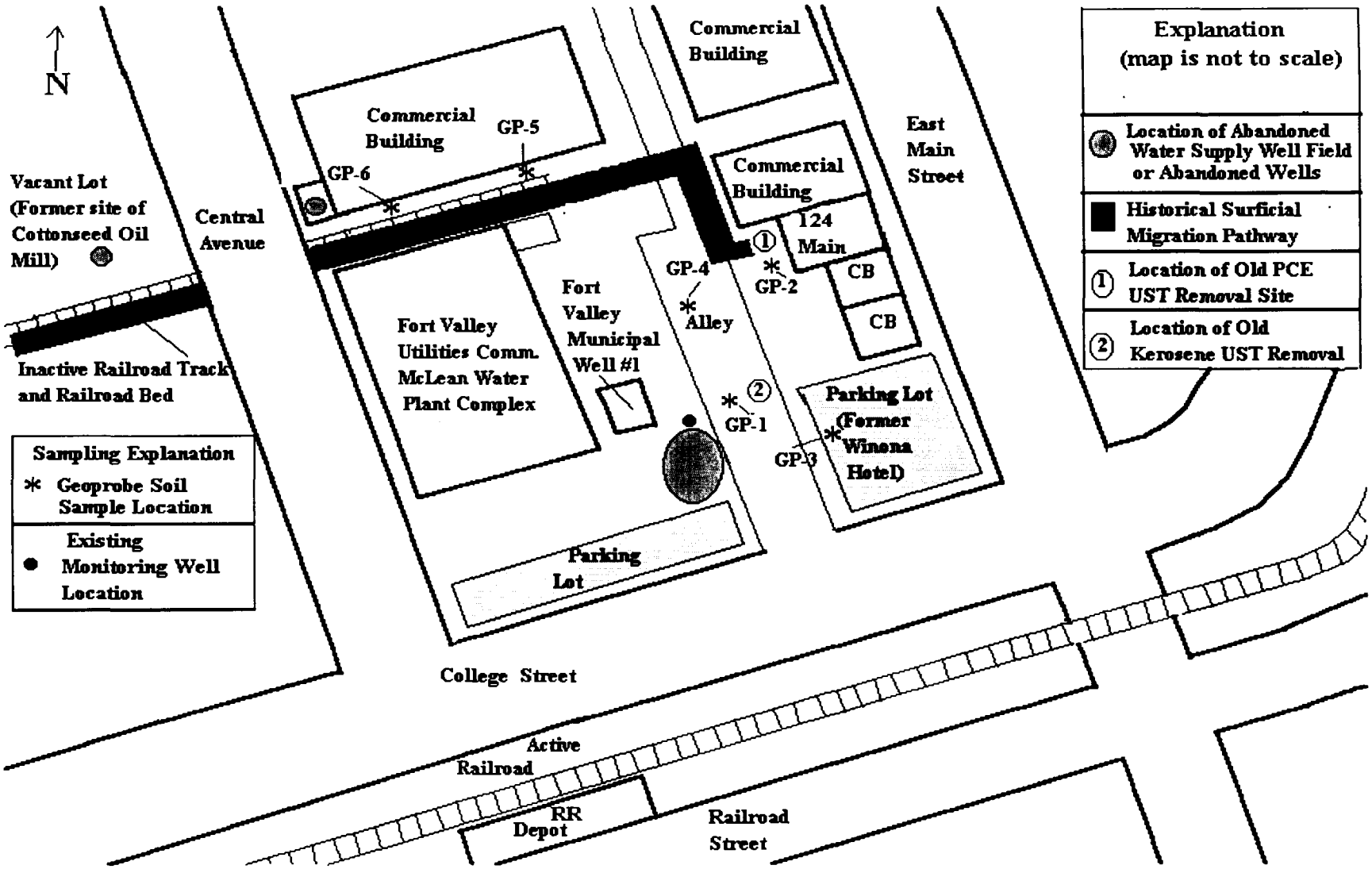



Figure 3. Sample Locations for Former Main Street Laundry (124 Main Street), Fort Valley, GA.

GEORGIA ENVIRONMENTAL PROTECTION DIVISION
HAZARDOUS WASTE MANAGEMENT BRANCH

CHAIN OF CUSTODY

FACILITY: FORT VALLEY, GA LOCATION: FORMER MAIN STREET LAUNDRY

| SAMPLE # | HWMB LOG # | LAB # | DESCRIPTION | COLLECTED BY (NAME) | DATE | TIME |
|---|---|---|---|---|---|---|
| 3A | 7338 | | SITE 3 (HOTEL) 4' - SOIL | BRENT RABON | 10/27/97 | 11:03AM |
| 3B | 7339 | | SITE 3 (HOTEL) 10' - SOIL | BRENT RABON | 10/27/97 | 11:20AM |
| 1A | 7340 | | SITE 1 (DCUST) 8' - SOIL | BRENT RABON | 10/27/97 | 12:02PM |
| 1B | 7341 | | SITE 1 (DC UST) 12' - SOIL | BRENT RABON | 10/27/97 | 12:17PM |
| 4A | 7342 | | SITE 4 (ALLEY) 4' - SOIL | BRENT RABON | 10/27/97 | 4:25PM |
| 4B | 7343 | | SITE 4 (ALLEY) 8' - SOIL | BRENT RABON | 10/27/97 | 4:40PM |
| 5A | 7344 | | SITE 5 (RAILROAD BED) 5' - SOIL | BRENT RABON | 10/27/97 | 5:12PM |
| 2A | 7345 | | SITE 2 (UST) - 9' - SOIL | BRENT RABON | 10/28/97 | 9:15AM |

TRANSFER RECORD

| TRANSFERRED BY (NAME) | TO (NAME) (IF FINAL: LAB NAME) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (NAME) | DATE |
|---|---|---|---|---|---|---|
| BRENT RABON | Rec. Lab | 10/28/97 | 3:00PM | Hand | Robert Price | 10/28/97 |
| | | | | | | |
| | | | | | | |

ANALYSIS REQUESTED:

R:/Mitchell
Forms. Custody. FRM

**GEORGIA ENVIRONMENTAL PROTECTION DIVISION**
**HAZARDOUS WASTE MANAGEMENT BRANCH**

**CHAIN OF CUSTODY**

**FACILITY:** FORT VALLEY, GA **LOCATION:** FORMER MAIN STREET LAUNDRY

| SAMPLE # | HWMB LOG # | LAB # | DESCRIPTION | COLLECTED BY (NAME) | DATE | TIME |
|---|---|---|---|---|---|---|
| 2B | 7346 | | SITE 2 (UST) - 12' - SOIL | BRENT RABON | 9:32AM | 10/28/97 |
| 6A | 7347 | | SITE 6 (RAILROAD BED) - 3' - SOIL | BRENT RABON | 10/28/97 | 10:50AM |
| 6B | 7348 | | SITE 6 (RAILROAD BED) - 8' - SOIL | BRENT RABON | 10/28/97 | 11:02AM |
| 1C | 7349 | | SHALLOW WELL - GROUNDWATER | BRENT RABON | 10/28/97 | 12:08PM |
| EPD TRIP BLANK | 7350 | | EPD LAB TRIP BLANK | ~~[illegible]~~ | 10/22/97 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**TRANSFER RECORD**

| TRANSFERRED BY (NAME) | TO (NAME) (IF FINAL: LAB NAME) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (NAME) | DATE |
|---|---|---|---|---|---|---|
| BRENT RABON | Inorganic Lab | 10/28/97 | 3:00PM | Hand | Robert Price | 10/28/97 |
| | | | | | | |
| | | | | | | |

**ANALYSIS REQUESTED:** _____

R:/mitchell

HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

SITE 3A

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY ST (aka WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7338

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** 3I INVESTIGATION

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Water | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Concentration of Organics Requested (e.g., trace): High ____ Low ____ Other (e.g., mass size, volume) _____

Describe Sample including Source and Known Properties (e.g., pH, concentration):

SOIL CONTAMINATED PER RCW WITH TETRACHLOROETHYLENE OR KEROSENE

Analysis Requested by: _____

Sampling Location: _____

AB3-1242

ANALYSIS

Date Received: _____

Date Completed: _____

Sample Collected: _____

Lab Notes: Will analyze for total. A TCLP will subsequently

## 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & base/Neutral) | ✓ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

2 4 OZ. JARS
1 8 OZ. JARS
1 16 OZ. JARS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

Organics Special Request: _____

## 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: _____

## 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back):

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | ____ | Date: | ____ | Received By (EPD Lab): | Robert Rice |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/28/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84242** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 11:03 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7338 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7338 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***'anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 44.1 | | ug/kg | SMA | 11/03/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 39.5 | | ug/kg | SMA | 11/03/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |



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mg/l : milligrams/liter
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Trace: Below quantitation limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Toluene | 34483 | 8260 | 5 | 6.2 | | ug/kg | SMA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 45.7 | | ug/kg | SMA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/03/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 53.4 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | .,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 66.7 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 61.9 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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**Laboratory Contacts:**

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|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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**Laboratory Contacts:**

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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ,deno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 69.3 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 66.6 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 72.5 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB) SITE 38

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY ST (OKA WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7339

***(File a separate Reqest Sheet for each sample point)***

**Analysis Needed By:** **Routine** ____ **Other (specify):** SI INVESTIGATION

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Liquids | ____ | Soil/Sediment | ✓ | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Concentration of Organics Requested (mg/kg): Low ____ High ____ Other (e.g. more than ...) ____

Describe Sample Including Source and Any Properties (e.g. est. concentration):

SOIL CONTAMINATED BY [illegible] STORAGE [illegible]

Additional Information: ____

Special Procedures: ____

[illegible]

Sample collector: [illegible]

## 1. TOTAL ORGANICS

| | | | |
|---|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ✓ | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Volatiles | ✓ | Mercury | ____ |
| Pesticides | ____ | Metals Special Request: | ____ |
| Herbicides | ____ | | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

1 1 1 2
4 OZ JARS
8 OZ JARS
16 OZ JARS

**Organics Special Request:** ____

## 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

**Additional Specific Organics For TCLP:** ____

## 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | ____ | Date: | ____ | Received By (EPD Lab): | Robert Pui |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/28/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84243** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 11:20 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7339 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7339 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.2 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.8 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |

**Sample ID : AB84243**



RAMETER CODE: EPA
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.0 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 23.9 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | _,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 27.5 | LSPEC | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 24.6 | LSPEC | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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**Laboratory Contacts:**

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|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 27.7 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 24.6 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 35.5 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB) SITE 1A

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY ST (FORMER MAIN STREET LAUNDRY) (AKA WINONA HOTEL PRESSING CLUB)

**Sample Collected By/Phone:** B. RAGON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7340

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** Routine ____ **Other (specify):** 3I INVESTIGATION

Sample Description (check one)

Waste ____ Soil/Sediment X Sludge ____

Ground Water ____ Surface Water ____ Drinking Water Well ____

Concentration of [illegible] (estimated): High ____ Low ____ Other (e.g., trace, plume, [illegible]) ____

Describe Sample Source and Known Properties (e.g., pH, concentration):

[illegible]

Sample collector: RAGON/WIL[illegible]

1. TOTAL ORGANICS

Semi-Volatiles (Acid & Base/Neutral) ✓

Volatiles ✓

Pesticides ____

Herbicides ____

Organophosphorous Pesticides ____

PCB ____

BETX ____

Total Petroleum Hydrocarbon ____

Organics Special Request: ____

1 1 2

4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____

Mercury ____

Metals Special Request: ____

3. TCLP ORGANICS

Volatiles ____ Pesticides ____

Semi-Volatiles (Acid & Base/Neutral) ____ Herbicides ____

Additional Specific Organics For TCLP: ____

4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ Additional Metals For TCLP: ____

Mercury ____

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ____

Reviewed By (HWMB): ____ Date: ____ Received By (EPD Lab): Robert Price

Approved By (HWMB): ____ Date: ____ Date (EPD Lab): 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84244** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 12:02 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7340 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7340 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | .,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.0 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.0 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | ,-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | 15.4 | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.0 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 54.8 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | _,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 62.0 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 60.3 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ,ideno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 68.9 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 65.7 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 68.4 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
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| Metals : | Harjinder Ghuman | Ext. 5223 |
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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB) SITE 1B

# REQUEST FOR LABORATORY ANALYSIS

THG

**Facility Name/Location:** FORT VALLEY ST (aka WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7341

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** SI INVESTIGATION

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Water | ____ | Sediment | ✓ | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Concentration of Organics (estimate if unknown): High ____ Low ____ Other (e.g., metals, specify) ____

Describe Sample including Source and Known Properties (e.g., pH, concentration):

[illegible] TRICHLOROETHYLENE [illegible]

Applicable [illegible]

Special [illegible]

1. TOTAL ORGANICS

| | | |
|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ | 1 4 OZ. JARS |
| Volatiles | ✓ | 1 8 OZ. JARS |
| Pesticides | ____ | 2 16 OZ. JARS |
| Herbicides | ____ | |
| Organophosphorous Pesticides | ____ | |
| PCB | ____ | |
| BETX | ____ | |
| Total Petroleum Hydrocarbon | ____ | |

**Organics Special Request:** _____

2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

**Additional Specific Organics For TCLP:** _____

4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

**Reviewed By (HWMB):** _____ **Date:** _____ **Received By (EPD Lab):** Robert Price

**Approved By (HWMB):** _____ **Date:** _____ **Date (EPD Lab):** 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84245** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 12:17 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7341 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7341 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ..,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.2 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ırbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.3 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | .-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.1 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 65.5 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | .,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 76.4 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 70.6 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 82.4 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 78.1 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 81.0 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

SITE 4A

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY ST (aka WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7342

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** 3T INVESTIGATION

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Concentration of organics [illegible] High ____ Low ____ Other (e.g., mixed matrix - specify) _____

Describe Sample Including Physical and Known Properties (e.g., pH, concentration):

TRICHLOROETHYLENE OR KEROSENE

Additional Comments: Cooler ____

[illegible] 5342-6

[illegible]

1. ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ✓ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

1 4 OZ. JARS
1 8 OZ. JARS
2 16 OZ. JARS

2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

Organics Special Request: _____

## 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: _____

## 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | ____ | Date: | ____ | Received By (EPD Lab): | Robert Price |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/28/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84246** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 16:25 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7342 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7342 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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**Laboratory Contacts:**

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| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 44.7 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ırbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 49.6 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | 6.19 | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.5 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics*** | ***Semivolatile Soil/Sed (8270)*** | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 65.0 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



PARAMETER CODE: EPA
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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 77.7 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 66.9 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
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Trace: Below quantitation limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 79.7 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 79.0 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 81.8 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB) SITE 4B

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** FORT VALLEY ST (aka WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/27/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7343

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** 3T INVESTIGATION

Sample Description (check one)

[illegible] ____ Subsediment ____ Sludge ____

[illegible] ____ Surface Water ____ Drinking Water Well ____

[illegible] ____ Other (e.g., [illegible]) ____

Describe Sample Including S[illegible] [illegible] (est. concentration):

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

## 1. TOTAL [illegible]

Sample collection [illegible]

| | | | |
|---|---|---|---|
| Sem[illegible] (Acid & Base/Neutral) | ____ | | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ |
| Volatiles | ✓ | 2 | Mercury ____ |
| Pesticides | ____ | 4 OZ. JARS | Metals Special Request: ____ |
| Herbicides | ____ | 8 OZ. JARS | |
| Organophosphorous Pesticides | ____ | 16 OZ. JARS | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

Organics Special Request: _____

## 3. TCLP ORGANICS

Volatiles ____ Pesticides ____

Semi-Volatiles (Acid & Base/Neutral) ____ Herbicides ____

Additional Specific Organics For TCLP: _____

## 4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ Additional Metals For TCLP: _____

Mercury ____

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

**Reviewed By (HWMB):** _____ **Date:** _____ **Received By (EPD Lab):** Robert Rice

**Approved By (HWMB):** _____ **Date:** _____ **Date (EPD Lab):** 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84247** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 16:40 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7343 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7343 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



PARAMETER CODE: EPA
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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 44.8 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ırbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.3 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ethylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.6 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics*** | ***Semivolatile Soil/Sed (8270)*** | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 65.9 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



PARAMETER CODE: EPA
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mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ',6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 77.0 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 73.2 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?enzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ·exachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 82.2 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 81.0 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 84.3 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB) SITE 5 X GHL

# REQUEST FOR LABORATORY ANALYSIS

Facility Name/Location: FORT VALLEY ST (aka WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

Sample Collected By/Phone: B. RABON / E. WILLIAMS

Collection Date: 10/27/97

Date Submitted To Lab: 10/28/97 LAB No. _____

HWMB LOG NUMBER: 7344

*(File a separate Request Sheet for each sample point)*

Analysis Needed By: Routine ____ Other (specify): SI INVESTIGATION

Sample Description (check one)

Water ____ Soil/Sediment X Sludge ____

Ground Water ____ Surface Water ____ Drinking Water Well ____

Concentration of Contaminants (est.): High ____ Low ____ Other (e.g. rinse blank, etc.) ____

Description Sample Including Sources and Known Properties (e.g., pH, concentration):

[illegible]

[illegible] ONLY

[illegible]

1. TOTAL ORGANICS

Sample collection [illegible]

| | | | |
|---|---|---|---|
| Sample Volume (Acid & Base/Neutral) | ✓ | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Volatiles | ✓ | Mercury | ____ |
| Pesticides | ____ | Metals Special Request: | ____ |
| Herbicides | ____ | | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

2 4 OZ. JARS
1 8 OZ. JARS
1 16 OZ. JARS

Organics Special Request: _____

3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: _____

4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

Reviewed By (HWMB): _____ Date: _____ Received By (EPD Lab): Robert Rice

Approved By (HWMB): _____ Date: _____ Date (EPD Lab): 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84248** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/27/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 17:12 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7344 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7344 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***·anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | ı,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ',2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 43.8 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ırbon Disulfide | 78544 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.1 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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TIE: Tentatively identified/Estmated value
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USPEC: Greater than specification limits
LSPEC: Lower than specification limits


**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1ethylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | 7.93 | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 48.1 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 54.4 | | ug/kg | LSN | 11/21/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 70.2 | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 59.1 | | ug/kg | LSN | 11/21/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Trace | | ug/kg | LSN | 11/21/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 9,10-Anthracedione | | 8270a | -0- | 1881 TIE | | ug/kg | LSN | 11/21/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |



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| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]anthracene | 34529 | 8270a | 660 | 1665 | | ug/kg | LSN | 11/21/97 |
| | enzo[a]pyrene | 34250 | 8270a | 660 | 2063 | | ug/kg | LSN | 11/21/97 |
| | Benzo[b]fluoranthene | 34233 | 8270a | 660 | 2653 | | ug/kg | LSN | 11/21/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | 1772 | | ug/kg | LSN | 11/21/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | 1944 | | ug/kg | LSN | 11/21/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chyrsene | 34323 | 8270a | 660 | 3404 | | ug/kg | LSN | 11/21/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dimethylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Fluoranthene | 34379 | 8270a | 660 | 6176 | | ug/kg | LSN | 11/21/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Indeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | 1943 | | ug/kg | LSN | 11/21/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Naphthalene | 34445 | 8270a | 660 | Trace | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 75.5 | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenanthrene | 34464 | 8270a | 660 | 6108 | | ug/kg | LSN | 11/21/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 74.2 | | ug/kg | LSN | 11/21/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pyrene | 34472 | 8270a | 660 | 6880 | | ug/kg | LSN | 11/21/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Substituted Phenanthrene | | 8270a | -0- | 896 TIE | | ug/kg | LSN | 11/21/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 73.0 | | ug/kg | LSN | 11/21/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

REQUEST FOR LABORATORY ANALYSIS

SITE 2A

GHL

**Facility Name/Location:** FORT VALLEY ST (aka WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/28/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7345

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** ST INVESTIGATION

Sample Description (check one)

[illegible] ____ Soil/Sediment ____ Sludge ____

[illegible] Water ____ Surface Water ____ Drinking Water Well ____

Concentration [illegible] High ____ Low ____ Other [illegible]

[illegible] concentration:

[illegible]

1. TOTAL ORGANICS

Sample collection [illegible]

| | | | |
|---|---|---|---|
| Semi-Volatiles (Acid & base/Neutral) | ✓ | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Volatiles | ✓ | Mercury | ____ |
| Pesticides | ____ | Metals Special Request: | ____ |
| Herbicides | ____ | | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

2 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

**Organics Special Request:** _____

3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

**Additional Specific Organics For TCLP:** _____

4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

**Reviewed By (HWMB):** _____ **Date:** _____ **Received By (EPD Lab):** Robert Price

**Approved By (HWMB):** _____ **Date:** _____ **Date (EPD Lab):** 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84249** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 09:15 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7345 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7345 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.4 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | arbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 51.3 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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Trace: Below quantitation limits
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LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|
| Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| .-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | SMA | 10/31/97 |
| Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.6 | | ug/kg | SMA | 10/31/97 |
| trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | |
| 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 9.28 | LSPEC | ug/kg | LSN | 11/21/97 |
| 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 75.3 | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 17.9 | LSPEC | ug/kg | LSN | 11/21/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 79.2 | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ıenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 47.3 | | ug/kg | LSN | 11/21/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 81.0 | | ug/kg | LSN | 11/21/97 |

**Sample comments :**

*End of Report*



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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB) SITE 2B G

# REQUEST FOR LABORATORY ANALYSIS

**Facility Name/Location:** FORT VALLEY ST (FORMER MAIN STREET LAUNDRY) (aka WINONA HOTEL PRESSING CLUB)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/28/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7346

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** SI INVESTIGATION

Sample Description (check one)

Air ____ Soil/Sediment X Sludge ____

Drinking Water ____ Surface Water ____ Drinking Water Well ____

Concentration of Contaminant: Low ____ High ____ Other (e.g., [illegible] specify): _____

Description of Sample Taken, Source And Known Properties (e.g., pH, concentration):

[illegible]

Sample collector: RABON/WILLIAMS

| | | | |
|---|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ✓ | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Volatiles | ✓ | Mercury | ____ |
| Pesticides | ____ | Metals Special Request: | ____ |
| Herbicides | ____ | | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

4 OZ. JARS ____
8 OZ. JARS ____
16 OZ. JARS ____

**Organics Special Request:** _____

## 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

**Additional Specific Organics For TCLP:** _____

## 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | ____ | Date: | ____ | Received By (EPD Lab): | Robert Price |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/28/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84250** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 09:32 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7346 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7346 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***'anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
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MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.2 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ırbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.3 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|
| Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.3 | | ug/kg | SMA | 10/31/97 |
| trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | |
| 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 59.2 | | ug/kg | LSN | 11/20/97 |
| 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | .,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 66.5 | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 63.4 | | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | :methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıdeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | N-Butyl-Benzenesulfonamide | | 8270a | -0- | 9796 TIE | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 69.7 | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 65.5 | | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 72.2 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
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TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

SITE QA

# REQUEST FOR LABORATORY ANALYSIS

**Facility Name/Location:** FORT VALLEY ST (aka WINONA HOTEL PRESSING CLUB) (FORMER MAIN STREET LAUNDRY)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/28/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7347

*(File a separate Reqest Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** SI INVESTIGATION

Sample [illegible]

[illegible] ____ Surface Water ____ Sludge ____

[illegible] ____ Surface Water ____ Drinking Water Well ____

[illegible] High ____ Low ____ [illegible] (e.g., rinse blank - [illegible]) _____

Describe [illegible] and Known Hazardous [illegible]:

[illegible]

[illegible]

[illegible] Date

1. TC[illegible] [illegible] collector, [illegible]

| | | | |
|---|---|---|---|
| Soil (Acid & Base/Neutral) | ____ | | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ |
| Volatiles | ✓ | 4 OZ. JARS | Mercury ____ |
| Pesticides | ____ | 8 OZ. JARS | Metals Special Request: ____ |
| Herbicides | ____ | 16 OZ. JARS | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

**Organics Special Request:** _____

## 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

**Additional Specific Organics For TCLP:** _____

## 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | ____ | Date: | ____ | Received By (EPD Lab): | Robert Rice |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/28/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84251** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 10:50 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7347 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7347 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 43.2 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ırbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 53.9 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | -Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.8 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 44.2 | | ug/kg | LSN | 11/20/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | .,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 24.7 | LSPEC | ug/kg | LSN | 11/20/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 2.15 | LSPEC | ug/kg | LSN | 11/20/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



PARAMETER CODE: EPA
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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | enzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |



. ARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits


**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ydrocarbon Compounds | | 8270a | -0- | 2937 TIE | | ug/kg | LSN | 11/20/97 |
| | Indeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 7.65 | LSPEC | ug/kg | LSN | 11/20/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/20/97 |
| | ıenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 5.13 | LSPEC | ug/kg | LSN | 11/20/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/20/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 70.2 | | ug/kg | LSN | 11/20/97 |

**Sample comments :**

*End of Report*



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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

REQUEST FOR LABORATORY ANALYSIS

SITE 6B

GHL

**Facility Name/Location:** FORT VALLEY SI (FORMER MAIN STREET LAUNDRY) (aka WINONA HOTEL PRESSING CLUB)

**Sample Collected By/Phone:** B. RABON / E. WILLIAMS

**Collection Date:** 10/28/97

**Date Submitted To Lab:** 10/28/97 **LAB No.** _____

**HWMB LOG NUMBER:** 7348

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** **Routine** ____ **Other (specify):** SI INVESTIGATION

[illegible] condition (check one)

[illegible] ____ Soil/Sediment X Sludge ____

Ground Water ____ Surface Water ____ Drinking Water Well ____

[illegible] ____ Other [illegible] ____

Describe sample including source And Known Properties (e.g., ph, concentration):

[illegible] TETRACHLOROETHYLENE [illegible]

A5642E7

Sample collector: RAB[illegible]/WILLIAMS

1. TOTAL ORGANICS

| | | | |
|---|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ✓ | ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Volatiles | ✓ | Mercury | ____ |
| Pesticides | ____ | Metals Special Request: | ____ |
| Herbicides | ____ | | |
| Organophosphorous Pesticides | ____ | | |
| PCB | ____ | | |
| BETX | ____ | | |
| Total Petroleum Hydrocarbon | ____ | | |

2 4 OZ. JARS
— 8 OZ. JARS
— 16 OZ. JARS

Organics Special Request: _____

3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: _____

4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | ____ | Date: | ____ | Received By (EPD Lab): | Robert Price |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/28/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84252** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 11:02 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7348 |
| **Sample Site:** | FORT VALLEY SI SOIL HW7348 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | 141 | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.9 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | rbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 51.0 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.9 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |
| ***Organics Semivolatile Soil/Sed (8270)*** | | | | | | | | | |
| | 2,4,5-Tetrachlorobenzene | 79787 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2-Dichlorobenzene | 34539 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,2-Diphenylhydrazine | 34349 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,3-Dichlorobenzene | 34569 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1,4-Dichlorobenzene | 34574 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1-Chloronaphthalene | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 1-Naphthylamine | 73143 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,3,4,6-Tetrachlorophenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4,5-Trichlorophenol | 78401 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4,6-Tribromophenol(Surrogate QC Std.) | | 8270a | -0- | 54.8 | | ug/kg | LSN | 11/21/97 |
| | 2,4,6-Trichlorophenol | 34624 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dichlorophenol | 34604 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dimethylphenol | 34609 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dinitrophenol | 34619 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2,4-Dinitrotoluene | 34614 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ?,6-Dichlorophenol | 73122 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | _,6-Dinitrotoluene | 34629 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chloronaphthalene | 34584 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Chlorophenol | 34589 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorobiphenyl(Surrogate QC Std.) | | 8270a | -0- | 59.5 | | ug/kg | LSN | 11/21/97 |
| | 2-Fluorophenol(Surrogate QC Std.) | | 8270a | -0- | 56.4 | | ug/kg | LSN | 11/21/97 |
| | 2-Methylnaphthalene | 78868 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Naphthylamine | 73124 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitroaniline | 78299 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Nitrophenol | 34594 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 2-Picoline | 73310 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3,3'-Dichlorobenzidine | 34634 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Methylcholanthrene | 73156 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 3-Nitroaniline | 78869 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4,6-Dinitro-2-methylphenol | 34660 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Aminobiphenyl | 73125 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Bromophenyl-phenylether | 34639 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloro-3-methylphenol | 34455 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Chloroaniline | 78867 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chlorophenyl-phenylether | 34644 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Methylphenol | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitroaniline | 78870 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 4-Nitrophenol | 34649 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | 7,12-Dimethylbenz(a)anthracene | 73115 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | aa-dimethyl-Phenethylamine | 73136 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthene | 34208 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acenaphthylene | 34203 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Acetophenone | 73272 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aldrin | 39333 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Alpha-BHC | 39076 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Aniline | 73185 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Anthracene | 34223 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzidine | 39121 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzoic acid | 75315 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[a]anthracene | 34529 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits


**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Benzo[a]pyrene | 34250 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[b]fluoranthene | 34233 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[g,h,i]perylene | 34524 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzo[k]fluoranthene | 34245 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Benzyl alcohol | 75212 | 8270a | 1300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Beta-BHC | 34257 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethoxy)methane | 34281 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroethyl)ether | 34276 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Chloroisopropyl)ether | 34286 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | bis(2-Ethylhexyl)phthalate | 39102 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Butylbenzylphthalate | 34295 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Chyrsene | 34323 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Delta-BHC | 34262 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-butylphthalate | 39112 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Di-n-octylphthalate | 34599 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz(a,j)acridine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenzofuran | 75647 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dibenz[a,h]anthracene | 34559 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Dieldrin | 39383 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Diethylphthalate | 34339 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | methylphthalate | 34344 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Diphenylamine | | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 1 | 34364 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan 2 | 34359 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endosulfan Sulfate | 34354 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin | 39393 | 8270a | 1320 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Endrin Aldehyde | 34369 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Ethylmethanesulfonate | 73118 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Fluoranthene | 34379 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Fluorene | 34384 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Gamma-BHC | 39343 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor | 39413 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Heptachlor Epoxide | 39423 | 8270a | 1650 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobenzene | 39701 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorobutadiene | 38705 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Hexachlorocyclopentadiene | 34389 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |



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| Metals : | Harjinder Ghuman | Ext. 5223 |
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| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Hexachloroethane | 34399 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | .ydrocarbon Compounds | | 8270a | -0- | 809 TIE | | ug/kg | LSN | 11/21/97 |
| | Indeno[1,2,3-cd]pyrene | 34406 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Isophorone | 34411 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Methylmethanesulfonate | 73119 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-butylamine | 73159 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitroso-di-n-propylamine | 34428 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodimethylamine | 34441 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosodiphenylamine | 34436 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | n-Nitrosopiperidine | 73129 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Naphthalene | 34445 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene | 34450 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Nitrobenzene-d5(Surrogate QC Std.) | | 8270a | -0- | 61.7 | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDD | 39311 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDE | 39321 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p,p'-DDT | 39301 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | p-Dimethylaminoazobenzene | 73116 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorobenzene | 79790 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachloronitrobenzene | 81808 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pentachlorophenol | 39061 | 8270a | 3300 | Not detected | | ug/kg | LSN | 11/21/97 |
| | ıenacetin | 73117 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenanthrene | 34464 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenol | 34695 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Phenol-d5(Surrogate QC Std.) | | 8270a | -0- | 61.5 | | ug/kg | LSN | 11/21/97 |
| | Pronamide | 73031 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pyrene | 34472 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Pyridine | 73312 | 8270a | 660 | Not detected | | ug/kg | LSN | 11/21/97 |
| | Terphenyl-d14(Surrogate QC Std.) | | 8270a | -0- | 74.8 | | ug/kg | LSN | 11/21/97 |

**Sample comments :**

*End of Report*



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| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
REQUEST FOR LABORATORY ANALYSIS

EXISTING MW GW

Facility Name/Location: FORT VALLEY SI (FORMER MAIN STREET LAUNDRY) dba WINONA HOTEL PRESS CLUB

Sample Collected By/Phone: B. RABON / E. WILLIAMS 404/656-2833

Collection Date: 10/28/97

Date Submitted To Lab: 10/28/97 LAB No. _____

HWMB LOG NUMBER: 7349

*(File a separate Reqest Sheet for each sample point)*

Analysis Needed By: Routine ____ Other (specify): SI INVESTIGATION

[illegible]

Sludge ____

Concentration [illegible] Other (please state - if [illegible]) ____

Describe [illegible] Source [illegible] (e.g. pH concentration):

[illegible]

Additional [illegible]

[illegible]

1. TOTAL ORGANICS

Semi-Volatiles (Acid & Base/Neutral) ____

Volatiles ✓

Pesticides ____

Herbicides ____

Organophosphorous Pesticides ____

PCB ____

BETX ____

Total Petroleum Hydrocarbon ____

Organics Special Request: ____

Sample Container Required:

OIL AND GREASE
SULFIDES/PHENOLS
VOC VIALS
AMBER BOTTLES
METAL BOTTLES
FCOL BOTTLES
NUTRIENTS/SULFATES
HALF GALLONS/CYANIDE

ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____

Mercury ____

Metals Special Request: ____

3. TCLP ORGANICS

Volatiles ____ Pesticides ____

Semi-Volatiles (Acid & Base/Neutral) ____ Herbicides ____

Additional Specific Organics For TCLP: ____

4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ Additional Metals For TCLP: ____

Mercury ____

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ____

Reviewed By (HWMB): ____ Date: ____ Received By (EPD Lab): Robert Price

Approved By (HWMB): ____ Date: ____ Date (EPD Lab): 10/28/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84253** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 16:58 | **Time Collected:** | 12:08 |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7349 |
| **Sample Site:** | FORT VALLEY SI WATER HW7349 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Water*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | 77562 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34506 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34516 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34511 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1-Dichloroethane | 34496 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1-Dichloroethene | 34501 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/L | JDA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2,3-Trichloropropane | 77443 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34551 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 77222 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2-Dibromoethane | 77651 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34536 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,2-Dichloroethane | 32103 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |



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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34541 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | .,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34566 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34571 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 2-Butanone | 81595 | 8260 | 100 | Not detected | | ug/L | JDA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34576 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 2-Chlorotoluene | 77275 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 2-Hexanone | 77103 | 8260 | 50 | Not detected | | ug/L | JDA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 81596 | 8260 | 50 | Not Detected | | ug/L | JDA | 11/03/97 |
| | Acetone | 81552 | 8260 | 100 | Not detected | | ug/L | JDA | 11/03/97 |
| | Benzene | 34030 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Bromobenzene | 81555 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Bromodichloromethane | 32101 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 43.5 | | ug/L | JDA | 11/03/97 |
| | Bromoform | 32104 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Bromomethane | 34413 | 8260 | 10 | Not detected | | ug/L | JDA | 11/03/97 |
| | arbon Disulfide | 77041 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Carbon Tetrachloride | 32102 | 8260 | 5 | Not Detected | | ug/L | JDA | 11/03/97 |
| | Chlorobenzene | 34301 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Chloroethane | 34311 | 8260 | 10 | Not detected | | ug/L | JDA | 11/03/97 |
| | Chloroform | 32106 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Chloromethane | 34418 | 8260 | 10 | Not detected | | ug/L | JDA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34704 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Dibromochloromethane | 32105 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.4 | | ug/L | JDA | 11/03/97 |
| | Dibromomethane | 77596 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Dichlorodifluoromethane | 34668 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Ethylbenzene | 34371 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Hexachlorobutadiene | 38702 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Iodomethane | 77424 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |



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| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34423 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | ,-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Naphthalene | 34696 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | o-Xylene | 77135 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | p,m-Xylene | 77135 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Styrene | 77128 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Tetrachloroethene | 34475 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Toluene | 34010 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 49.0 | | ug/L | JDA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34546 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34699 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Trichloroethene | 39180 | 8260 | 5 | Not Detected | | ug/L | JDA | 11/03/97 |
| | Trichlorofluoromethane | 34488 | 8260 | 5 | Not detected | | ug/L | JDA | 11/03/97 |
| | Vinyl Acetate | 77057 | 8260 | 50 | Not detected | | ug/L | JDA | 11/03/97 |
| | Vinyl Chloride | 39175 | 8260 | 2 | Not detected | | ug/L | JDA | 11/03/97 |

**Sample comments :**

*End of Report*



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**HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)**
**REQUEST FOR LABORATORY ANALYSIS**

**Facility Name/Location:** FORT VALLEY ST (Former Main Street Laundry) aka Winona Hotel Press Club

**Sample Collected By/Phone:** B RABON / E. WILLIAMS 404/656-2833

**Collection Date:** 10/22/97

**Date Submitted To Lab:** 10/28/97

**LAB No.** _____

**HWMB LOG NUMBER:** 73500

EPD TRIP BLANK

*(File a separate Reqest Sheet for each sample point)*

Analysis Needed By: Routine ____ Other (sp[illegible] Georgia Dept. of Natural Resources

[illegible] ____ Soil Sedi[illegible]

[illegible] Water ____ Source [illegible]

[illegible] of Contact [illegible]ested (estimated): High ___ L[illegible]

Describe Sample Including Source And Known Properties (e.g., pH, concentration): [illegible] ector: RABON/W[illegible]

[illegible] REQUIRED

(Note: Totals will [illegible] be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |
| Organics Special Request: | ____ |

| | |
|---|---|
| ____ OIL AND GREASE | |
| ____ SULFIDES/PHENOLS | |
| ✓ VOC VIALS | |
| ____ AMBER BOTTLES | |
| ____ METAL BOTTLES | |
| ____ FCOL BOTTLES | |
| ____ NUTRIENTS/SULFATES | |
| ____ HALF GALLONS/CYANIDE | |

2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: ____

4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ____

Reviewed By (HWMB): ____ Date: ____ Received By (EPD Lab): ____

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | RABON/WILLIAMS | **Sample ID :** | **AB84254** |
| **Date Received:** | 10/28/97 | **Date Collected:** | 10/22/97 |
| **Time Received:** | 16:58 | **Time Collected:** | -0- |
| **Reporting Date:** | 12/03/97 | **DNR Lab Reference:** | HW7350 |
| **Sample Site:** | FORT VALLEY SI TRL BLK HW7350 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Water*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | 77562 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1,1-Trichloroethane | 34506 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1,2,2-Tetrachloroethane | 34516 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1,2-Trichloroethane | 34511 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1-Dichloroethane | 34496 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1-Dichloroethene | 34501 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2,3-Trichloropropane | 77443 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2,4-Trichlorobenzene | 34551 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2,4-Trimethylbenzene | 77222 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2-Dibromoethane | 77651 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2-Dichlorobenzene | 34536 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,2-Dichloroethane | 32103 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34541 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,3-Dichlorobenzene | 34566 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 1,4-Dichlorobenzene | 34571 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 2-Butanone | 81595 | 8260 | 100 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 2-Chloroethyl vinyl ether | 34576 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 2-Chlorotoluene | 77275 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 2-Hexanone | 77103 | 8260 | 50 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | 4-Methyl-2-Pentanone | 81596 | 8260 | 50 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Acetone | 81552 | 8260 | 100 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Benzene | 34030 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Bromobenzene | 81555 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Bromodichloromethane | 32101 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | 0 | 47.0 | | ug/L | SMA | 10/29/97 |
| | Bromoform | 32104 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Bromomethane | 34413 | 8260 | 10 | Not Detected | | ug/L | SMA | 10/29/97 |
| | ırbon Disulfide | 77041 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Carbon Tetrachloride | 32102 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Chlorobenzene | 34301 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Chloroethane | 34311 | 8260 | 10 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Chloroform | 32106 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Chloromethane | 34418 | 8260 | 10 | Not Detected | | ug/L | SMA | 10/29/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | cis-1,3-Dichloropropene | 34704 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Dibromochloromethane | 32105 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | 0 | 51.5 | | ug/L | SMA | 10/29/97 |
| | Dibromomethane | 77596 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Dichlorodifluoromethane | 34668 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Ethylbenzene | 34371 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Hexachlorobutadiene | 38702 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Iodomethane | 77424 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |



. ARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits


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| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34423 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | ,-Butylbenzene | 77342 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Naphthalene | 34696 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | o-Xylene | 77135 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | p,m-Xylene | 77135 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Styrene | 77128 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Tetrachloroethene | 34475 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Toluene | 34010 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | 0 | 48.0 | | ug/L | SMA | 10/29/97 |
| | trans-1,2-Dichloroethene | 34546 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | trans-1,3-Dichloropropene | 34699 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Trichloroethene | 39180 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Trichlorofluoromethane | 34488 | 8260 | 5 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Vinyl Acetate | 77057 | 8260 | 50 | Not Detected | | ug/L | SMA | 10/29/97 |
| | Vinyl Chloride | 39175 | 8260 | 2 | Not Detected | | ug/L | SMA | 10/29/97 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
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DRAFT

# SITE INSPECTION WORK PLAN

## FORMER DRY CLEANERS - MAIN STREET
## (HEREAFTER REFERRED TO AS THE FORMER WINONA HOTEL PRESSING CLUB)
## FORT VALLEY, PEACH COUNTY, GEORGIA
## EPA ID # GA0001974948

**PREPARED FOR:**

U.S. ENVIRONMENTAL PROTECTION AGENCY REGION IV
ATLANTA FEDERAL BUILDING
61 FORSYTH STREET, SW
ATLANTA, GEORGIA 30303-3415

**PREPARED BY:**

BRENT RABON
AND
EDDIE WILLIAMS
GEORGIA ENVIRONMENTAL PROTECTION DIVISION
205 BUTLER STREET, SE
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ATLANTA, GEORGIA 30334

**REVIEWED BY:**

BRUCE KHALEGHI
GEORGIA ENVIRONMENTAL PROTECTION DIVISION

SEPTEMBER 1997

DRAFT

## TABLE OF CONTENTS


1.0 INTRODUCTION . . . . . 1

2.0 SITE DESCRIPTION AND HISTORY . . . . . 1

2.1 Location . . . . . 1
2.2 Site Description . . . . . 1
2.3 Operational History and Waste Characteristics . . . . . 4

3.0 SAMPLING ACTIVITIES . . . . . 4

3.1 Surface Water Sampling . . . . . 6
3.2 Sediment Sampling . . . . . 6
3.3 Groundwater Sampling . . . . . 6
3.4 Soil Sampling . . . . . 7
3.5 Groundwater and Soil Sampling to determine Background . . . . . 7
3.6 Quality Assurance . . . . . 7
3.7 Field Activities . . . . . 9
3.8 Quality Control Procedures . . . . . 9

4.0 INVESTIGATORY DERIVED WASTE . . . . . 9

5.0 PROJECT MANAGEMENT . . . . . 9

5.1 Health and Safety . . . . . 10
5.2 Project Schedule . . . . . 10

6.0 REFERENCES . . . . . 11

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## LIST OF FIGURES


Figure 2.1 U.S. Geological Survey 7.5 Minute Series Topographic Map of the Former Winona Hotel Pressing Club Site . . . . . 2

Figure 2.2 Former Winona Hotel Pressing Club Location on a Fort Valley City Map . . . 3

Figure 2.3 Preferential Drainage Pathway from Former Winona Hotel Pressing Club . . . 5

Figure 3.1 Sampling Locations at the Former Winona Hotel Pressing Club . . . . . 8

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# 1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Hazardous Waste Management Branch of the Georgia Environmental Protection Division (GA EPD) will conduct a Site Inspection (SI) at the site known as the Former Dry Cleaners, Main Street, hereinafter known as the Former Winona Hotel Pressing Club (FWHPC), located in the City of Fort Valley, Peach County, Georgia. The SI will investigate the pathways of potential releases that may threaten human health and the environment as identified in the Summary Preliminary Assessment dated June 3, 1997 (Reference 1).

The scope of the investigation will include collecting soil and groundwater samples from the location of the Former Winona Hotel Pressing Club Underground Storage Tank (UST) and at locations along a former preferential drainage surface water pathway, associated with operations from the FWHPC. In addition, EPD's Georgia Geologic Survey Branch (GGS) will be conducting a Phase I investigation in the City of Fort Valley to assist in determining the source(s) that have contaminated the City of Fort Valley's Municipal Water Supply (FVMS) Wells Nos. 1 and 2. Groundwater analytical results, obtained from permanent monitoring wells installed by the GGS will be used to evaluate the presence or absence of contamination on the southwestern side of Municipal Well #1. Additional groundwater sampling will be conducted on a monitoring well, approximately 25 feet deep, that is located between the FVMS Well No. 1 and the FWHPC site to determine if operations at FWHPC may have caused the contamination in Well No. 1.

# 2.0 SITE DESCRIPTION AND HISTORY

## 2.1 Location

The Former Winona Hotel Pressing Club was located in what is now an alley between the McLean Water Plant and Main Street at a location approximately 50 feet northwest of Fort Valley Municipal Well 1. The geographic coordinates are latitude 32°33'10.1" North and longitude 83°53'10.0" West (Reference 1; Also See Figure 2.1).

## 2.2 Site Description

The Former Winona Hotel Pressing Club is located within the wellhead protection area of both Municipal Water Supply Wells (Reference 1). The Site is also located within an area of mixed land usage which includes small businesses, restaurants, the McLean Water Plant (at the Municipal Supply Well No. 1) of the Fort Valley Utilities Commission and the Woolfolk Chemical Works Industrial Complex (Reference 2)(Figure 2.2).

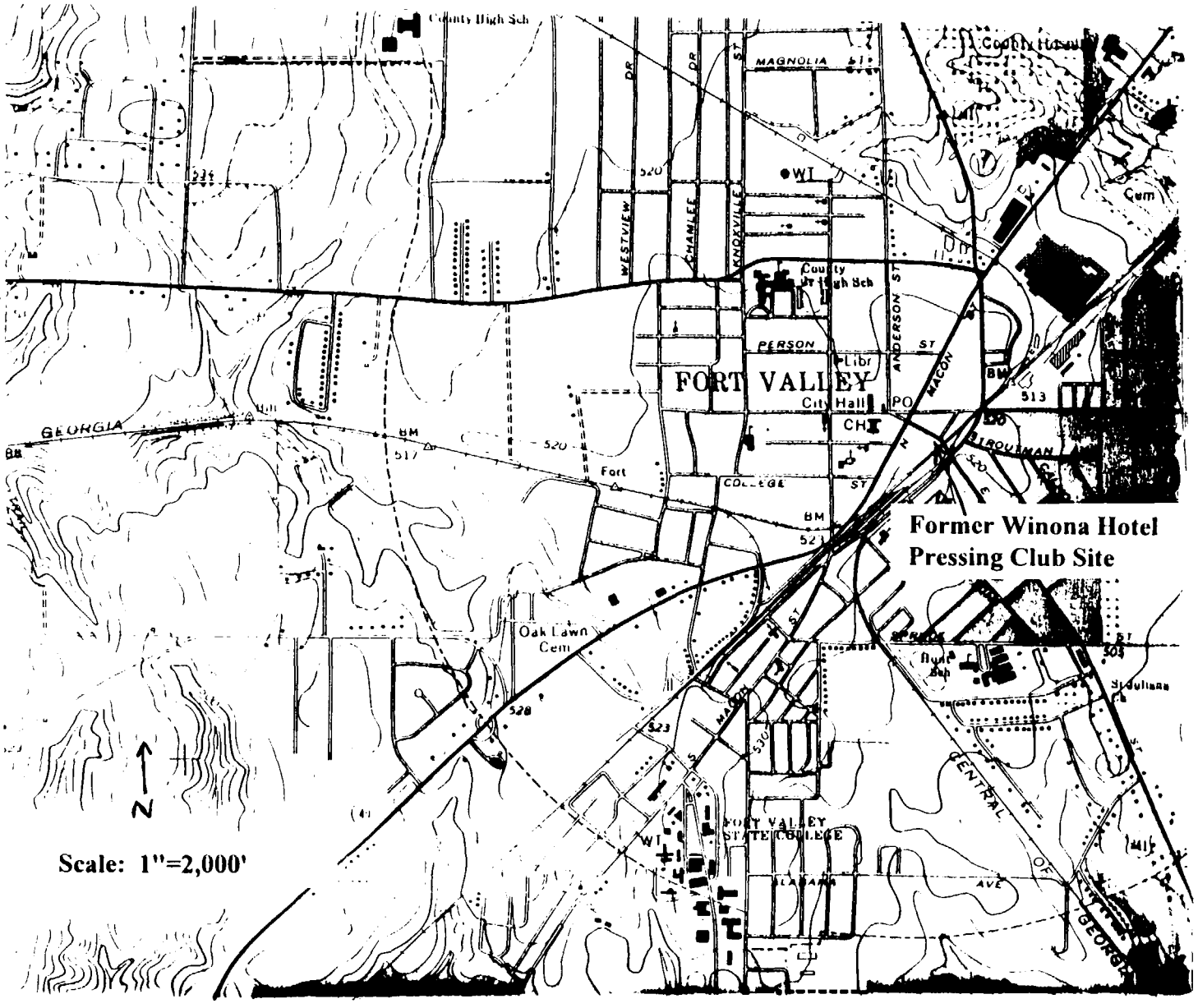



Figure 2.1 - U.S. Geological Survey 7.5 Minute Series Topographic Map (Fort Valley West, 1973) of the Former Winona Hotel Pressing Club Site.

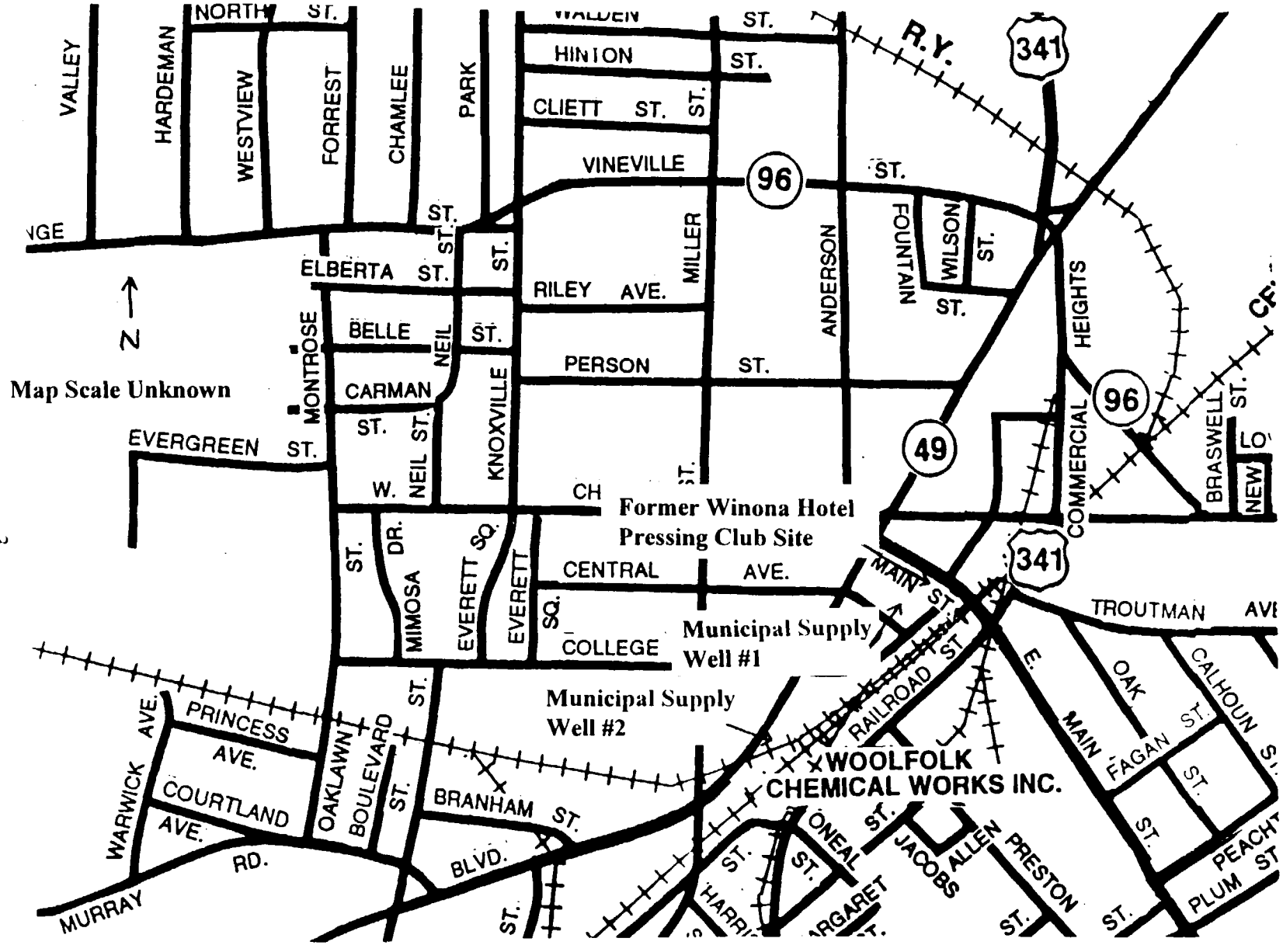



Figure 2.2 Former Winona Hotel Pressing Club Location on a City of Fort Valley Map.

Tetrachloroethylene (PCE) has been detected in the Fort Valley Municipal Water Supply Wells Nos. 1 and 2 at concentration ranges of 1 ug/l to 18 ug/l and 1 ug/l to 16 ug/l, respectively (References 2 and 3; Also See Figure 2.2).

### 2.3 Operational History and Waste Characteristics

Limited history is known of the Former Winona Hotel Pressing Club. According to Mr. Calvin Mason, the former owner of this property, the Pressing Club associated with the Winona Hotel (also known as the Harris House) operated until approximately 1934 and was managed by Mr. Miles Johnson. According to Mr. Mason, the Pressing Club routinely dumped excess dry cleaning fluids on the ground and these fluids would drain from the Club along the then-unpaved preferential pathway shown in Figure 2.3. Mr. Mason also reported that a large number of pigs were killed on a farm in the City of Fort Valley in the early 1930s; these animals reportedly died from drinking contaminated water which drained from the Pressing Club and other businesses in the city at that time. The Winona Hotel was torn down in the early 1970s.

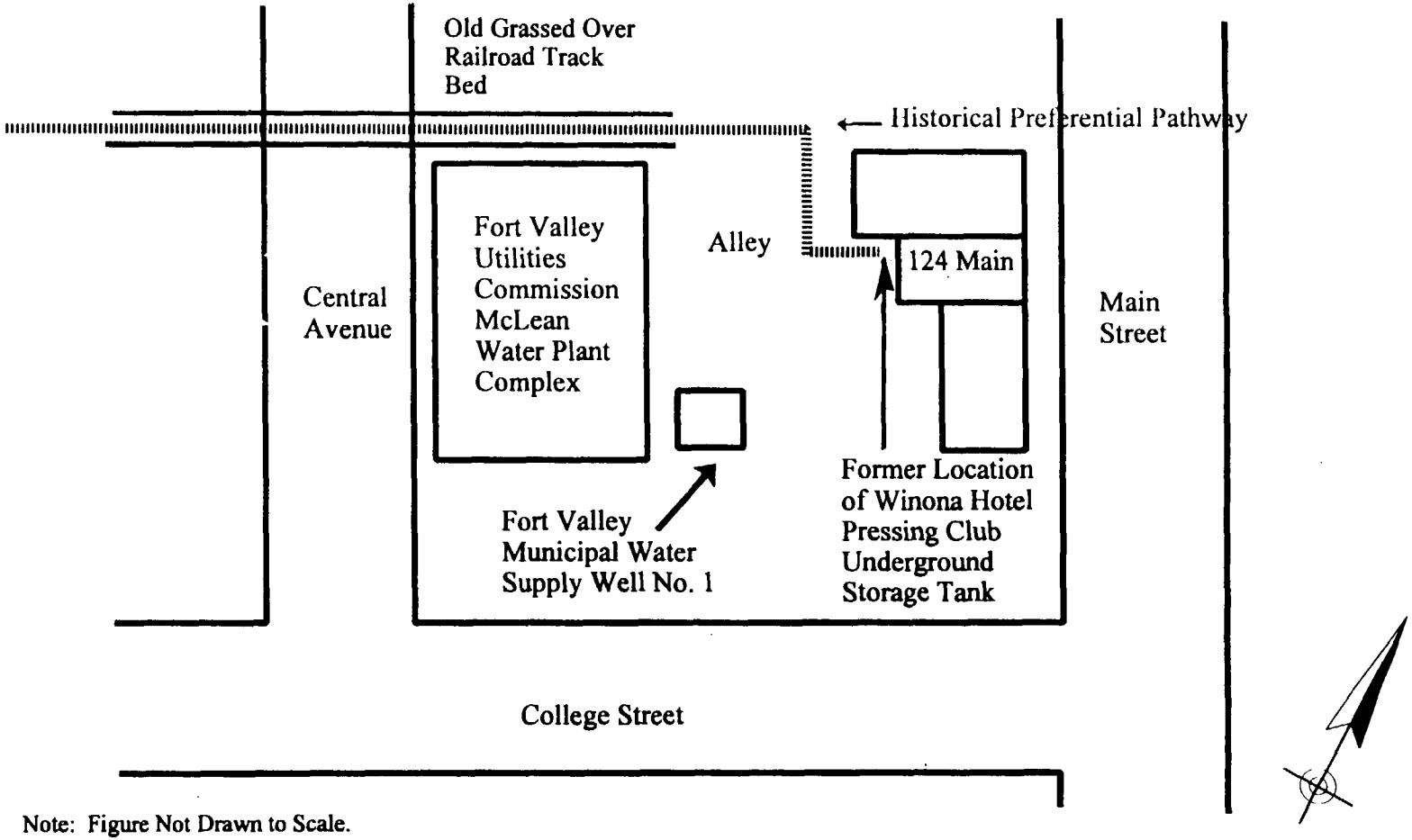
In February 1975, a tornado destroyed the Old Fort Valley Water and Light Building and heavily damaged the City of Fort Valley; Mr. Mason bought the property at 124 Main Street the following month. As part of the cleanup efforts in the aftermath of the tornado, the City of Fort Valley regraded the area behind Mr. Mason's store. During this effort in April 1978, an approximately 500-gallon UST was discovered and removed. Mr. Mason stated that the tank contained a couple of hundred gallons of liquid that he believed to be dry cleaning fluid and that the liquid and soils around the tank had a very strong kerosene-like odor. Contaminated soils were removed within the UST excavation to a depth of approximately eight (8) feet below the current ground surface. Final disposition of the UST and the contaminated soils is unknown (References 1, 2, and 3).

Documented releases of PCE cannot be confirmed at the Former Winona Hotel Pressing Club Site with the information known at this time; however, the former location of the Winona Hotel Pressing Club is approximately 40-50 feet northwest of the PCE-contaminated Fort Valley Municipal Water Supply Well No. 1. Given the historical account provided by Mr. Mason, the potential for historical releases of PCE from the Former Winona Hotel Pressing Club is high.

## 3.0 SAMPLING ACTIVITIES

An attempt will also be made to locate the nearest private drinking water well. If a well is located a groundwater sample will be collected.

All environmental media sampling will be conducted according to standard operating procedures specified in the U.S. Environmental Protection Agency (EPA) Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (SOP/QAM) dated May 1996.




Note: Figure Not Drawn to Scale.

Figure 2.3: Preferential Drainage Pathway from Former Winona Hotel Pressing Club

## 3.1 Surface Water Sampling

No surface waters (i.e., streams or drainage ditches containing standing/moving water) were identified as potential receptors of the hazardous substances which may have been managed at the Former Winona Hotel Pressing Club. Although a preferential migration pathway existed during the time of the suspected releases, current conditions do not mirror the conditions that probably existed 50 years ago. Most of the area around the site is now developed, paved for roads, or asphalted for parking lots. Therefore, no surface water samples will be collected during this SI.

## 3.2 Sediment Sampling

No surface waters (i.e., streams or drainage ditches containing standing/moving water) were identified as potential receptors of the hazardous substances which may have been managed at the Former Winona Hotel Pressing Club; Although a preferential migration pathway existed during the time of the suspected releases, current conditions do not mirror the conditions that probably existed 50 years ago. Most of the area around the site is now developed, paved for roads, or asphalted for parking lots. Therefore, no sediment samples will be collected during this SI. Soil samples will be taken along the closest parts of the historical preferential migration pathway as detailed in Section 3.4.

## 3.3 Groundwater Sampling

Groundwater samples will be collected from a maximum of six Geoprobe boring locations, depending on groundwater availability, shown on Figure 3.1. In addition, a monitoring well is located next to the Fort Valley Municipal Water Supply Well No. 1. Mr. Gary Dye of the Fort Valley Utilities Commission (McLean Water Plant) stated that the he had a key to that monitoring well, approximately 25 feet deep, and that GA EPD should coordinate with him in order to collect a groundwater sample from the well. To the best of his knowledge, the well has been there for at least 9 years. His telephone number at the McLean Water Plant is 912/825-5482 (Reference 4). GA EPD will coordinate with Mr. Dye and will collect a groundwater sample from this monitoring well. This well sample will be analyzed for Volatile Organic Compounds (VOCs) in accordance with EPA SW-846 approved methods. The sample will be collected in accordance with the EPA Region IV SOP/QAM dated May 1996, following the purging of at least three (3) well volumes. A duplicate will also be taken at this monitoring well.

Groundwater samples will be collected within the surficial aquifer [expected at approximately fifteen (15) to twenty-five (25) feet below ground surface] via Geoprobe techniques and will be analyzed for VOCs in accordance with EPA SW-846 approved methods.

Samples will be collected through new clean tubing using the Geoprobe rod. Because the samples will be obtained using a Geoprobe, purging will not be necessary.

It should also be noted that the Georgia Geologic Survey Branch of GA EPD is also proposing to install five (5) permanent monitoring wells as part of their Phase I investigation of contamination of two of the municipal supply wells in the City of Fort Valley. The relevant groundwater analytical data from that field effort will be included in the Former Winona Hotel Pressing Club SI Report. Sampling of these wells will be conducted by the Safe Drinking Water Program of the Georgia EPD (Reference 5). All proposed sampling locations are indicated on Figure 3.1.

### 3.4 Soil Sampling

Soil samples will be collected from the soil samples retrieved by the Geoprobe. Up to two (2) soil samples will be collected at each Geoprobe location shown on Figure 3.1. Soil samples will be screened with a HNu photoionization detector (PID). Soil samples will be collected at two (2) Geoprobe borings at the Former Location of the Winona Hotel Pressing Club UST at depths of nine (9) feet and twelve (12) feet below ground surface (See Figure 3.1 and note that the depth of the surficial aquifer is expected to be approximately fifteen (15) to twenty-five (25) feet below ground surface).

Soil samples at the remaining four (4) Geoprobe Sampling Locations will be collected at three (3) feet and eight (8) feet below ground surface. All soil samples will be analyzed for VOCs in accordance with EPA SW-846 approved methods. All proposed sampling locations are indicated on Figure 3.1.

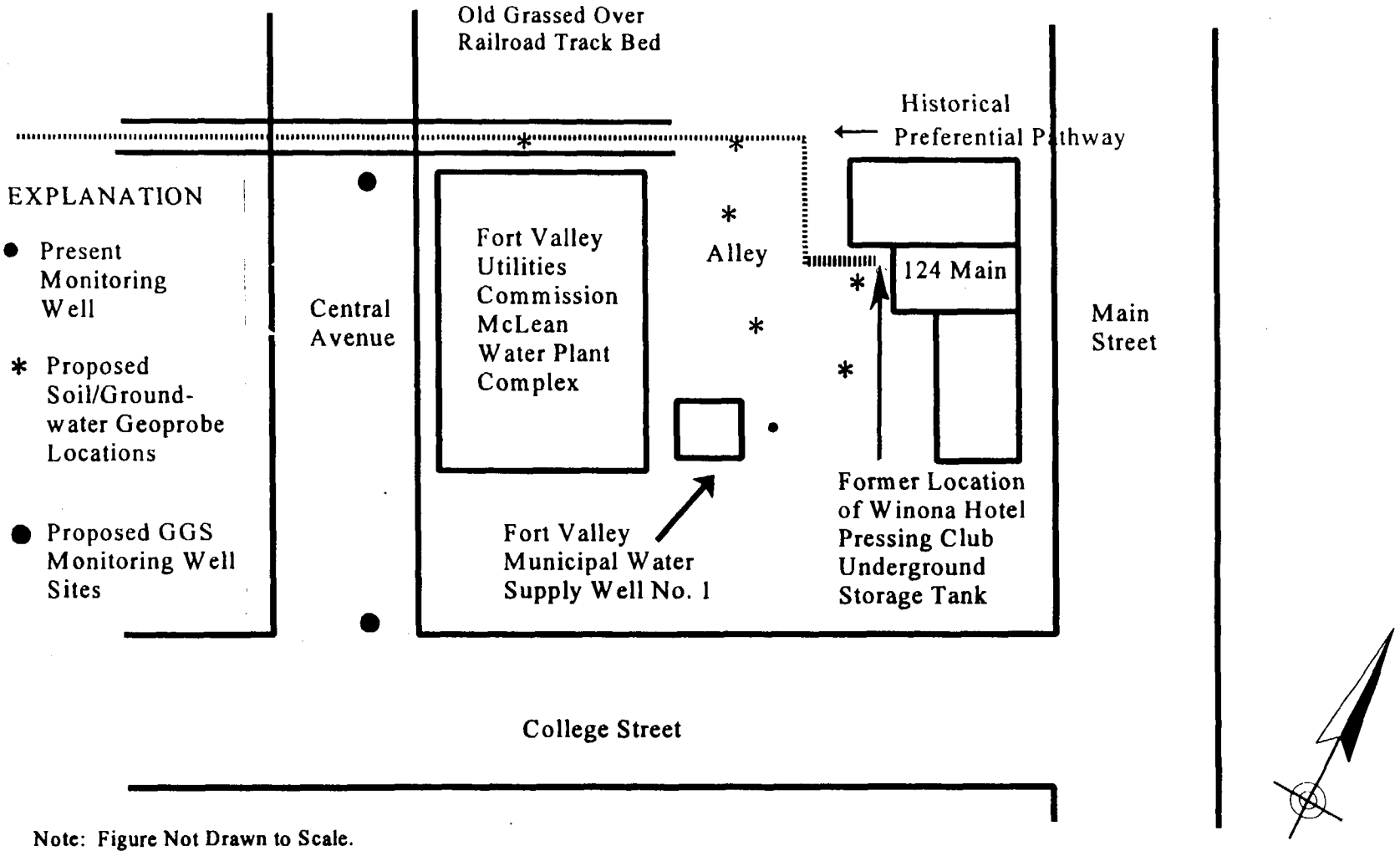
### 3.5 Groundwater and Soil Sampling to determine Background Concentrations

The site is surrounded heavily by development, including light industrial, heavy industrial, and commercial operations. The selection of suitable background will be determined at the time of the initial investigations.

### 3.6 Quality Assurance

Quality assurance and quality control (QA/QC) for this sampling event will be provided by collecting duplicate samples. One duplicate sample for each matrix sample will test the reliability of sampling procedures and results. Appropriate trip blanks and rinsate blanks, if decontamination is required, will be taken.

All sample collection, preservation, QA/QC preparation of duplicates and chain-of-custody procedure used during the sampling activities will be in accordance with the standard operating procedures specified in the EPA Region IV SOP/QAM dated May 1996.




Note: Figure Not Drawn to Scale.

Figure 3.1 Proposed Sampling Locations at the Former Winona Hotel Pressing Club

### 3.7 Field Activities

Field personnel are scheduled to travel to the site during the period of October 27 to November 7. Site access and access to drill on related properties will be obtained by EPD prior to that time. All utilities will be previously marked before the field activities begin.. All environmental samples and non-sampling information will be collected during that week. Field personnel are scheduled to leave the site by November 7, 1997.

Prior site reconnaissance will be conducted to verify that planned sample locations are appropriate and accessible. Upon verifying the sample locations and after any modifications are confirmed, sampling will begin. Sampling will begin with the upgradient sites.

Field personnel that may be involved with the site drilling and associated activities are included in Table 5.1 All personnel will be properly OSHA certified prior to site admittance. When required, proper site restrictions will be implemented.

### 3.8 Quality Control Procedures

All sampling will be performed with dedicated sampling equipment. All samples will be stored in coolers on ice until they are delivered to the GA EPD laboratory at the end of each day. Chain-Of-Custody will be maintained according to GA EPD SOP Section 4.2 (Appendix 6) by field personnel until samples are handed over to the GA EPD Laboratory in Atlanta.

## 4.0 INVESTIGATORY DERIVED WASTE PLAN

The purging of the monitoring well located between the Municipal Supply Well #1 and the Former Winona Hotel Pressing Club will require purging. Purge water will be containerized on site, pending analytical results. Disposal will be determined from the analytical results. No investigative derived waste is expected from the Geoprobe activities, with the exception of personal protective equipment (PPE). PPE will be containerized and removed at each day's end.

Decontamination wastes will be generated at the GGS's decontamination pad. IDW generated as a result of decontamination will be handled by GGS with the remainder of the IDW.

## 5.0 PROJECT MANAGEMENT

The project management for the Former Winona Hotel Pressing Club SI will be a team effort. The team will schedule field activities, personnel requirements, verify site access authority, direct and oversee all on-site and off-site activities associated with the investigation. The team will document and manage all collected samples.

| Personnel | Job Title | Site Responsibilities | Signature that plan has been read |
|---|---|---|---|
| Brent Rabon | Environmental Engineer | Coordinate Sampling Activities | |
| Eddie Williams | Senior Geologist | Assist in Geoprobe Operation and Sampling | |
| Thomas Williams | Environmental Engineer | Geoprobe Operator | |
| Bob Pierce | Advanced Geologist | Assist in Geoprobe Operation and Sampling | |
| Steve White | Environmental Specialist | Coordinate Fort Valley Project | |

## 5.1 Health and Safety

Safety monitoring equipment will be an HNu meter. Field protection will be level D during the site reconnaissance. Field dress for the reconnaissance will include work boots, disposable gloves, hardhats, and ear plugs. Disposable gloves will be worn during all sampling events and decontamination. All personnel will the OSHA certified prior to admittance to the site(s).

## 5.2 Project Schedule

Non-sampling data collection will begin in early October 1997. The SI field work will take place during the weeks of October 27 to November 7, 1997. GGS monitoring well completions have already begun and will continue to completion [currently expected to take five (5) weeks]. When the field tasks are completed, preparation of the SI Report will begin. Upon receipt of the analytical results, the scoring package for the site will be completed. The Final SI report will be completed by the end of the calendar year.

## 6.0 REFERENCES


1. GA EPD Correspondence (Ussery to McKeown) dated June 3, 1997; Summary Preliminary Assessment, Former Dry Cleaner - Main Street (Name Unknown), Peach County, Georgia.

2. GA EPD Site Visit to Fort Valley by Bob Pierce, Brent Rabon, Steve White and Eddie Williams; August 19, 1997.

3. GA EPD Site Visit to Fort Valley and Interview with Mr. Calvin Mason by Brent Rabon; September 11, 1997.

4. GA EPD Telephonic Conversation (E. Williams) with Mr. Gary Dye, Fort Valley Utilities Commission, September 24, 1997.

5. GA EPD Georgia Geologic Survey Fort Valley Phase I Investigation Plan, September 12, 1997.


r:\BRENTR\SI\FTVALL\WRKPLAN

# Georgia Department of Natural Resources

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Lonice C. Barrett, Commissioner
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Reply To:
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**MEMORANDUM**

September 12, 1997

To: William H. McLemore
State Geologist

From: Roger Carter
Regulatory Program Manager

James S. Guentert
Geologist

Larry Papetti
Geologist

Subject: Fort Valley Phase I Investigation Plan

The purpose of the Phase I investigation is to: (1) gain a better understanding of the hydrogeology and geology, (2) evaluate the perched and water table aquifer groundwater quality in the vicinity of City to both identify potential PCE sources and to allow deeper drilling and (3) evaluate the depths at which contaminants are entering City Well 1 and City Well 2. The following three tasks have been designed to achieve these objectives.

**Task I - Monitoring Well Installation and Sampling**

Monitoring wells are proposed to be installed at five locations in Ft. Valley in the general vicinity of city wells 1,2, and 5 as shown on Figure 1. Monitoring wells will be installed in streets in Ft Valley, because of insufficient right-of-way width along the streets, presence of above and below ground utilities, and inherent problems with obtaining permission and drilling on private property The City of Fort Valley has agreed that three monitoring well locations can be in Central Street and one in College Street. The fifth monitoring well location will be in State Highway 49, if permission is granted from the Georgia Department of Transportation.

Drilling Methods and Well Construction

Monitoring wells will be installed in the water table aquifer, which is anticipated to be

encountered at a depth of 100 - 120 feet. A shallow monitoring well will also be installed and sampled at each location, prior to drilling deeper, if a perched water bearing zone is encountered. A perched zone has been identified in this area above a kaolinite layer at a depth of 40 - 50 feet below ground level. A maximum of two monitoring wells at each of the five locations will be installed during this Phase I Investigation.

A hand auger will be used to dig to a depth of four feet at each location prior to drilling. The boreholes will be advanced using 4 1/4-inch I.D. hollow stem augers. Monitoring wells will be constructed with 2-inch diameter PVC casing and either 5-foot or 10-foot slotted screens. The annular space between the screen and borehole will be filled with an appropriately sized silica sand from the base of the borehole to approximately 2-feet above the top of the screen. A minimum 2-foot thick layer of bentonite hole plug will be placed above the sandpack. The remaining annular space will be filled with a cement-bentonite slurry grouted, pumped through a tremie pipe from the top of the hole plug layer to the ground surface.

An 8 1/4-inch diameter PVC surface casing will be installed, prior to drilling to the water table, at locations where a perched groundwater zone is encountered. The surface casing will be installed no closer than 5-feet from the perched groundwater monitoring well. Surface casings, where needed, will be installed by drilling 2-3 feet into the underlying kaolinite layer (approximately 50 feet) with 11 1/4-inch O.D hollow stem augers. The augers will then be removed, and the PVC casing installed in the open borehole. The annular space will be filled with a cement slurry grout from the base of the borehole to surface. The cement will be allowed to cure for at least 24 hours, before advancing 4 1/4-inch ID augers through the PVC surface casing to the water table. A monitoring well with a 10-foot screen will be installed in the upper portion of the water table as described above.

Monitoring wells will either be developed by hand bailing or through the use of a 2-inch diameter variable-flow submersible pump. Development water will be containerized in drums for later disposal.

Monitoring wells will be fitted with a locking, water-tight cap and completed with a flush-mounted, traffic-rated cover which is cemented in place.

Monitoring Well Surveying

Monitoring well locations and top-of-casing measuring points will be determined by a registered land surveyor. Top-of-casing measuring points will be determined to an accuracy of 0.01 feet and referenced to NGVD.

Soil Sampling and Analysis

Continuous soil cores will be collected using either a split core-barrel sampler, or split-spoon sampler. Grab samples will be collected from the cores at 2.5-foot intervals for field PID screening and/or laboratory analyses. One half of each soil grab sample will immediately be

placed in a ziplock bag, and screened for organic vapors in the field using a PID. The second half of each soil grab sample will immediately be placed in a soil jar and kept on ice for possible laboratory analysis. Soil samples for which PID readings above background values are obtained will be sent for laboratory analysis by EPA Method 502.2 (which includes PCE as a parameter). Otherwise, the deepest unsaturated soil sample will be sent for laboratory analysis. Additionally, a soil sample from the bottom of each boring (whether saturated or unsaturated) will be collected and analyzed by EPA Method 8260

Augers, drill rods, and soil sampling devices will be steam-decontaminated prior to drilling each well. Prior to collection of each soil sample within a boring, the sampling device will be scrubbed with a liquinox-water solution, rinsed with tap water, sprayed with isopropanol, and given a final rinse with distilled water.

At least one equipment rinseate blank will be collected per boring for soil sampling equipment. The equipment rinseate blank will be collected by pouring distilled water into the sample bottle through the decontaminated sampling device to be used for the first sample in each boring. The equipment rinseate blank will be analyzed by EPA Method 502.2.

Groundwater Sampling and Analysis

A new disposable teflon bailer will be used for each well. New disposable, powder-free latex gloves will be worn during sampling activities.

At least 3 well volumes of water will be purged from each monitoring well prior to sampling. During purging, pH, conductivity, and temperature will be monitored. If pH, temperature, and conductivity have not stabilized by the third well volume, purging will continue until the measurements have stabilized, or 5 well volumes have been removed.

Groundwater samples will be collected, and analyzed for volatile organic compounds (VOCs) by EPA Method 502.2 (the standard drinking-water analysis for VOCs). Immediately after collection, groundwater samples will be placed on ice. Quality assurance samples will include one field duplicate (split of one groundwater sample), one bailer rinseate blank (obtained by pouring distilled water through a clean bailer prior to use in a well), and one travel blank (sample of distilled water prepared by the laboratory to accompany sample bottles during transport) per sampling event. During the sampling event, monitoring wells with previously-confirmed contamination, or with suspected contamination (odor, etc.) will be sampled subsequently to wells expected to be clean.

Development water from all wells not previously shown to be clean will be contained in D.O.T.-compliant, properly labeled drums, and stored on fenced City of Ft. Valley property until analytical results are obtained. Contaminated development water will then either be disposed of by permitted, licensed contractors or discharged to the city sewer system.

Drill Cuttings and Fluids

Investigation derived soils and water will be handled in general accordance with the attached Investigation Derived Waste (IDW) Management Plan.

Drill cuttings and drilling mud will be staged at each location on plastic, awaiting transportation to a centrally located, lined roll-off box. The roll-off box will be kept in the fenced and locked municipal garage compound and will be covered with a plastic tarp. Liquids which may accumulate after the drilling mud has settled will be pumped off periodically into 55-gallon, steel drums. If determined to be non-hazardous the roll-off box will be transported to a Subtitle D landfill for disposal.

Sampling purge water and development water will be collected from each well in a separate 55-gallon, steel drum. Depending on the analytical results and levels of contaminants the water may be discharged to the City of Ft. Valley sewer system or disposed of at a licensed and permitted waste management facility.

**Task II - Gamma Ray Logging**

City well 1 and 2 and the deepest monitoring well installed by EPD at each location will be gamma ray logged using the Georgia Geologic Survey's logging van and equipment. Logging the city wells is dependant on the Fort Valley Utility Commission contracting the removal of the pumps and associated pipe and any residual lubricant oil floating on the water surface.

**Task III - Screened Interval Sampling**

Discreet groundwater samples will be collected from each screened interval in City Wells 1 and 2. The success of this task will be dependant on how accurately the screened intervals in each well can be identified. Historic downhole television logs in combination with driller's logs from City Well 1 and 2 will be used to identify the screened intervals. It is anticipated that 3-5 samples will be collected from each well.

Groundwater samples will be collected using a low-flow sampling pump, positioned in the middle of each screened interval. More than one sample may be collected in screened intervals greater than 20 feet long. The groundwater pH, temperature and conductivity will be carefully monitored to assist in collecting a groundwater sample representative of the formation quality at that depth, with minimal input form water stored within the gravel pack or stagnant water within the casing The pump that will be utilized is a nitrogen-operated, bladder pump capable of collecting groundwater samples from as deep as 1000 feet below ground level. If successful, this technique should give some indication of the depths where contaminated groundwater is entering the city wells. An added benefit of low-flow sampling is that the volume of purge water is minimized. Purge water from each interval will be containerized separately and disposed of based on the laboratory analytical results.

Groundwater samples collected from the screened intervals will be analyzed for volatile organic compounds, total metals, pesticides and herbicides.

# ATTACHMENT

## CONSIDERATIONS FOR MANAGING INVESTIGATION DERIVED WASTES

This plan addresses management of investigation derived waste (IDW) associated with investigative activities to be performed by the GGS Field Team. Wastes of concern include drill cuttings and mud, development/purge water from monitoring wells, contaminated personnel protective equipment (gloves, etc), sampling equipment (bailers, etc), drilling equipment (augers, etc), and soil and groundwater samples themselves.

In Particular, the following three EPA documents were reviewed in plan preparation:

- a quick reference Fact Sheet entitled *Guide to Management of Investigation-Derived Wastes* (January 1992), Publication 9345.3-03FS;
- a Region IV internal guidance memorandum TSC-92-02 entitled *Management of Contaminated Media* (December 28, 1992); and
- Section 5.15 (entitled *Investigation Derived Waste*) of the *Standard Operating Procedures-Quality Assurance Manual* (May 1996).

The following USTMP documents were also reviewed:

- *Petroleum Contaminated soil Disposal/Treatment—Guidance Document* (8/95, GUST-39); and
- *So You Want To Close An UST?—Petroleum Releases* (8/95, GUST-9).

**IDW Potentially Contaminated by a Listed or Characteristic Hazardous Waste, or by Petroleum from a Non-Exempted Source**

The *Decision Matrix for Managing Contaminated Media,* which is included in the December 28, 1992 EPA Region IV guidance memorandum, should be applied to IDWs which are potentially hazardous or non-exempted wastes. Accordingly, if an IDW is not suspected of being contaminated, or has been shown to be non-contaminated, then best management practices apply. For instance, non-contaminated or decontaminated soil, drilling mud, or development/purge water might be disposed of on the ground in the vicinity of the boring or well from which it was derived. Non-contaminated or decontaminated personnel protective equipment and sampling equipment should be disposed of in an ordinary household (Subtitle D) garbage recepticle such as a city dumpster.

IDW suspected or known to be contaminated by hazardous or non-exempted petroleum wastes should be managed as follows:

Drill cuttings and mud, decontamination fluids, and well development/purge water should be contained in drums or appropriate containers until analytical results are obtained. Containers and drums should be segregated by well/boring location in order to minimize the volume of contaminated media. The drums or containers should be temporarily labelled with drum markers identifying their contents, generator name and address, and date. If soil or groundwater analytical results indicate that the contained IDW might be contaminated by a hazardous or non-exempted petroleum waste, then a TCLP test should be run on the drum/container contents to determine if it is a characteristic waste.

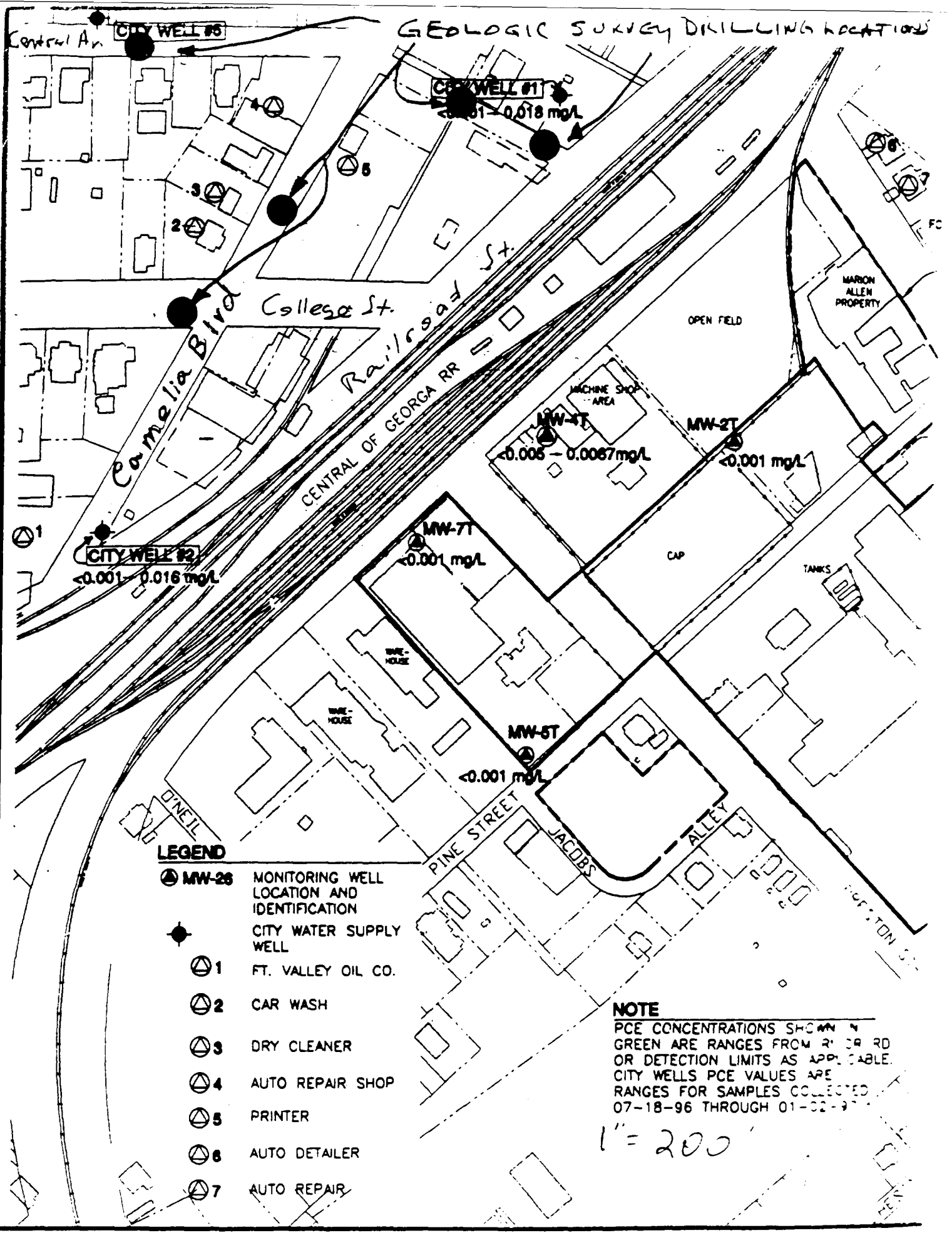
If TCLP analysis indicates that the drum/container contents are non-hazardous and non-contaminated, then the IDW should be disposed of by spreading onsite as described in the first paragraph of this section. If the contents pass the TCLP test (are non-hazardous), but are still contaminated above detection limits, then the drum/container should be labelled with an EPA/DOT compliant non-hazardous waste sticker, and the contents either disposed of in a RCRA Subtitle D Municipal Solid Waste Landfill, soil treatment (recovered materials) facility, or other licensed facility; or managed according to best management practices. Best management practices for contaminated, non-hazardous soil might consist of decontaminating soil onsite (ie spreading soil out on plastic sheeting, and allowing it to volatilize in the sun) and subsequent onsite disposal. If the drum/container contents fail the TCLP test, they should be labelled with an EPA/DOT-compliant hazardous waste sticker, and properly manifested and disposed of as a hazardous waste by a licensed waste hauler.

An exclusion is provided in *40 CFR Section 261.4(d)* for soil and groundwater samples in the process of being analyzed, or being transported for analysis. After analysis, the samples, if hazardous, will be properly disposed of by the EPD laboratories.

**IDW Potentially Contaminated by Petroleum from a Regulated UST Source**

We recommend that IDWs suspected of being contaminated by petroleum from a regulated UST source be managed according to GUST guidelines. Sampling equipment and PPE should be decontaminated onsite, and disposed of in a Subtitle D facility. Groundwater suspected of being contaminated should be drummed/containerized and labelled as described in the previous section. Soil suspected of being contaminated should be stockpiled on an inpermeable surface (ie concrete or asphalt), and enveloped in plastic sheeting unless it contains free product, in which case it should be drummed. If soil and/or groundwater analytical results indicate that the drummed/containerized/stockpiled IDW is likely to be contaminated, then it should be sampled for the suspected petroleum compounds. If sampling indicates that the IDW is clean, then it can be disposed of onsite as described in the previous section. If the soil is determined to be contaminated with petroleum from a regulated UST source, then it should be disposed of in a Municipal Solid Waste Landfill, or soil treatment (recovered materials) facility according to the GUST guidance document: *Petroleum Contaminated Soil Disposal/Treatment*.
Drummed/contained groundwater which is contaminated by petroleum from a regulated UST

source but is non-hazardous, should be labelled as non-hazardous with an appropriate sticker, and disposed of by a licensed waste disposal facility.


GEOLOGIC SURVEY DRILLING LOCATIONS
Central Av.
CITY WELL #6
CITY WELL #1
<0.001 – 0.018 mg/L
Camelia Blvd
College St.
Railroad St.
CENTRAL OF GEORGA RR
OPEN FIELD
MARION ALLEN PROPERTY
MACHINE SHOP AREA
MW-4T
<0.005 – 0.0067mg/L
MW-2T
<0.001 mg/L
CAP
TANKS
MW-7T
<0.001 mg/L
CITY WELL #2
<0.001 – 0.016 mg/L
WARE-HOUSE
WARE-HOUSE
MW-5T
<0.001 mg/L
O'NEIL
PINE STREET
JACOBS
ALLEY
LEGEND
MW-26 MONITORING WELL LOCATION AND IDENTIFICATION
CITY WATER SUPPLY WELL
1 FT. VALLEY OIL CO.
2 CAR WASH
3 DRY CLEANER
4 AUTO REPAIR SHOP
5 PRINTER
6 AUTO DETAILER
7 AUTO REPAIR
NOTE
PCE CONCENTRATIONS SHOWN IN GREEN ARE RANGES FROM RECORD OR DETECTION LIMITS AS APPLICABLE. CITY WELLS PCE VALUES ARE RANGES FOR SAMPLES COLLECTED 07-18-96 THROUGH 01-02-97
1" = 200'

# REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV



**EPA ID:** GASFN0406880 **Site Name:** NORFOLK SOUTHERN RAILROAD DEPOT **State ID:** 34/8 (4)

**Alias Site Names:**

**City:** FORT VALLEY **County or Parish:** PEACH **State:** GA

**Refer to Report Dated:** 09/01/1998 **Report Type:** SITE INSPECTION 001

**Report Developed by:** STATE

**DECISION:**

- [X] **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**
  - [X] **1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)**
  - [ ] **1b. Site may qualify for action, but is deferred to:**
- [ ] **2. Further Assessment Needed Under CERCLA:**
  - **2a. Priority:** [ ] **Higher** [ ] **Lower**
  - **2b. Other: (recommended action)** NFRAP (No Futher Remedial Action Planned

**DISCUSSION/RATIONALE:**

Four subsurface soil samples were collected at the site. Perchloroethylene was not detected in any of the subsurface soil samples collected. Therefore, no evidence was found that indicates that this site is contributing to the PCE contamination in the Fort Valley Municipal Wells 1 & 2.

**Site Decision Made by:** ALAN W. YARBROUGH

**Signature:** Alan W. Yarbrough **Date:** 01/06/1999

**EPA Form # 9100-3**

# SITE INSPECTION REPORT

# FOR

# NORFOLK SOUTHERN RAILROAD DEPOT
# FORT VALLEY, PEACH COUNTY, GEORGIA

**EPA ID:** GASFND406880

**Prepared By:**

**Steve White**
**Environmental Specialist**
**Georgia Environmental Protection Division**
**Hazardous Waste Management Branch**
**September 1998**

TABLE OF CONTENTS

Page

1. INTRODUCTION . . . . . 1

2. SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS . . . . . 1
   2.1 Location . . . . . 1
   2.2 Site Description, Operational History and Waste Characteristics . . . . . 1

3. SUBSURFACE SOIL SAMPLING . . . . . 1
   3.1 Analytical Results . . . . . 4
   3.2 Conclusions . . . . . 4

4. GROUND WATER PATHWAY . . . . . 4
   4.1 Hydrogeology . . . . . 4
   4.2 Ground Water Targets . . . . . 5
   4.3 Sample Locations . . . . . 5
   4.4 Analytical Results . . . . . 5
   4.5 Ground Water Conclusions . . . . . 5

5. SURFACE WATER PATHWAY . . . . . 5
   5.1 Hydrologic Setting . . . . . 6
   5.2 Surface Water Targets . . . . . 6
   5.3 Sample Locations . . . . . 7
   5.5 Surface Water Conclusions . . . . . 7

6. SOIL EXPOSURE AND AIR PATHWAYS . . . . . 7

7. SUMMARY AND CONCLUSIONS . . . . . 7

FIGURE 1 Site Location
FIGURE 2 Site Layout

TABLE 1 Sample Analysis Results
TABLE 2 Drinking Water Usage

APPENDIX A Topographic Map
APPENDIX B Wetlands Map
APPENDIX C Laboratory Sample Analysis Reports
APPENDIX D Photographs

Date: September 1998

Prepared by: Steve White
Environmental Specialist
Hazardous Waste Management Branch
Georgia Environmental Protection Division

# 1. INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Georgia Environmental Protection Division conducted a Site Inspection (SI) at the Norfolk Southern Railroad Depot site in Peach County, Georgia. The purpose of this investigation was to collect information concerning conditions at the Norfolk Southern Railroad Depot site sufficient to assess the threat posed to human health and the environment and to determine the need for additional CERCLA/SARA or other appropriate action. The scope of the investigation included review of available file information, a comprehensive target survey, and an on-site and off-site sampling reconnaissance.

# 2. SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

## 2.1 Location

The Norfolk Southern Railroad Depot site is located in Fort Valley, Peach County, Georgia at the intersection of Anderson Street and Main Street. The geographical coordinates are 32° 33' 7.2" N Latitude; 83° 53' 8.5" W Longitude, as shown on the United States Geological Survey (U.S.G.S.) Quadrangle Topographic Map, Sandersville Quadrangle (Figure 1, Reference 1) .

## 2.2 Site Description, Operational History and Waste Characteristics

The location of this site is within the likely capture area of Fort Valley Municipal Well 1. PCE has been detected above detection limits in the Fort Valley Municipal Water Supply Wells 1 and 2. This site is within the wellhead protection area of both Municipal Wells 1 and 2.

## 4.1 Subsurface Soil Sampling

Figure 2 shows the location of the four subsurface soil samples collected at the site. The four samples were collected from two sample points at 4 foot and 8 foot depths. Samples were collected utilizing EPA method 5035 for VOC analysis. Encore© samplers were utilized for all subsurface soil samples. Samples were packed on ice and transported to the EPD lab in Atlanta for analysis.

Figure 1. Location of the Norfolk Southern Railroad Depot.

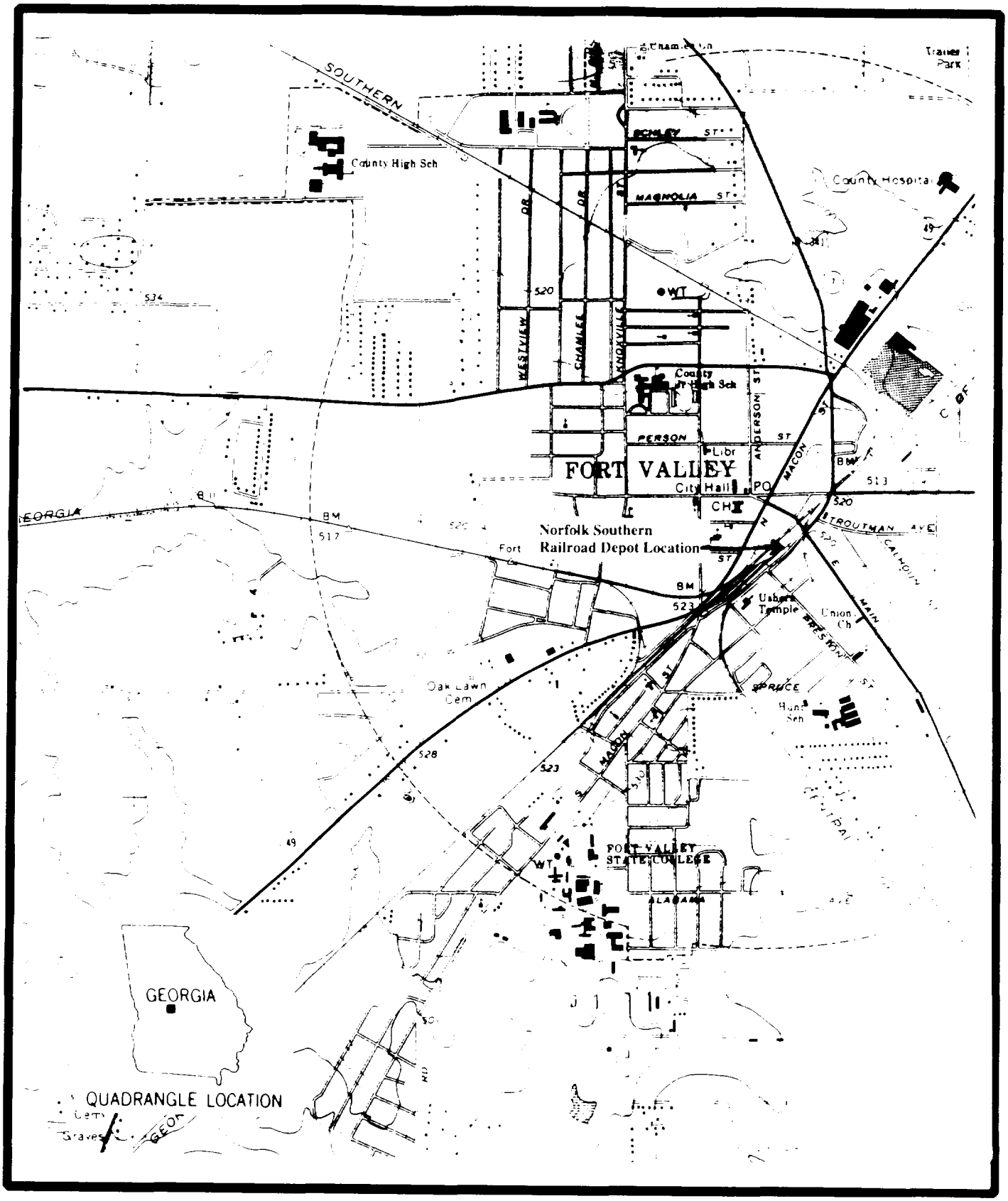
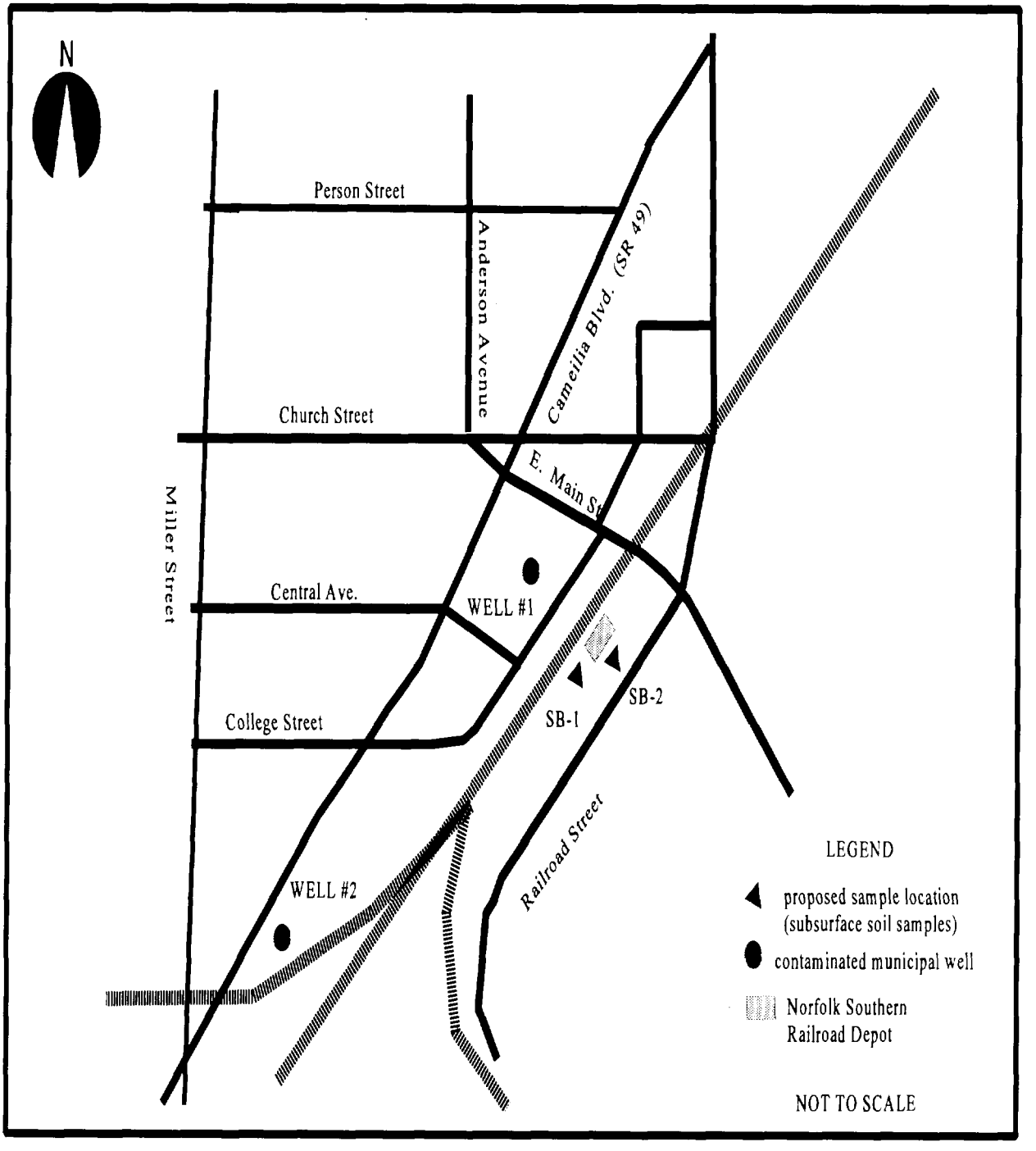


Figure 2. Downtown Fort Valley, Georgia; showing location of the Norfolk Southern Railroad Depot with proposed sample locations.



### 3.2 Analytical Results

Table 1 below show a list of constituents that were detected in the subsurface soil sample collected at the site.

**Table 1. Sample Analysis Results**

| CONSTITUENT | SAMPLE LOCATION | | | |
|---|---|---|---|---|
| | HW7795 | HW7796 | HW7797 | HW7798 |
| 1,2,4-trimethylbenzene | ND | 1097 ug/kg | ND | ND |
| 1,3,5-trimethylbenzene | ND | 583 ug/kg | ND | ND |
| acetone | ND | 132 ug/kg | ND | ND |
| ethylbenzene | ND | 34.2 ug/kg | ND | ND |
| isopropylbenzene | ND | 63.3 ug/kg | ND | ND |
| n-propylbenzene | ND | 130 ug/kg | ND | ND |
| naphthalene | ND | 490 ug/kg | ND | ND |
| p-isopropyltoluene | ND | 158 ug/kg | ND | ND |
| sec-butylbenzene | ND | 170 ug/kg | ND | ND |

### 3.3 Conclusions

Perchloroethylene (PCE) was not detected in any of the samples collected during this evaluation. Sample analysis indicates that there is no evidence of PCE in subsurface soils on-site at the Norfolk Southern Railroad Depot site.

## 4. GROUND WATER PATHWAY

### 4.1 Hydrogeology

The City of Fort Valley is located in the Fort Valley Plateau District of the Coastal Plain physiographic province. The dominant feature of the Fort Valley Plateau District is a broad, flat topped topography with fewer streams and less local relief than adjacent districts. The City of Fort Valley is located in an outcrop area of the Lower Paleocene Clayton formation which consists of sandy brick-red clay and fine to coarse grained sand. The Clayton formation is underlain by the Providence Sand, Providence-Ripley-Cusetta, Blufftown-Eutaw, and Tuscaloosa formations. The shallow most aquifer is the Clayton (or perched) aquifer which is composed 10-35 feet of silty fine sand. The Clayton aquifer is overlain by 10-15 feet of soil and a sandy clay unit, and underlain by an aerially extensive kaolin layer which ranges in thickness from 2-20 feet. Ground water in the

Clayton aquifer is under water table conditions, and depth to ground water in this aquifer is approximately 25-30 feet below land surface. The deepest aquifer in Fort Valley is the Tuscaloosa aquifer which occurs at a depth of about 250 feet below land surface. This aquifer is overlain by the Ripley/Blufftown - Eutaw semiconfining unit and ground water in the Tuscaloosa aquifer occurs under confined conditions. The Tuscaloosa aquifer is the primary source of ground water to the high capacity wells in the area including Fort Valley City wells 1, 2 and 5. [1,2]

### 4.2 Ground Water Targets

Table 2 shows the drinking water populations from public and private sources.

**Table 2. Drinking water usage.**

| Water Usage | Distance From Site (miles) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0-.25 | .25-.50 | .50-1.0 | 1.0-2.0 | 2.0-3.0 | 3.0-4.0 | Total |
| Total Population | 52 | 112 | 658 | 2231 | 3329 | 3371 | 9753 |
| Population on Private Wells | 3 | 9 | 34 | 234 | 396 | 437 | 1113 |
| Population on Public Water | 49 | 103 | 624 | 1997 | 2933 | 2934 | 8640 |

### 4.3 Sample Locations

Ground water samples were collected during a separate sampling event following the installation of five (5) ground water monitoring wells in downtown Fort Valley. Well installation and sampling was conducted pursuant to the Georgia Geologic Survey, Fort Valley Phase I Investigation Plan (Attached) Reference 2.

### 4.4 Ground Water Pathway Conclusions

It is unlikely that the perchloroethylene contamination found in Fort Valley Municipal Wells 1 and 2 is the result of activities at the Norfolk Southern Railroad Depot. Analysis of subsurface soil samples collected on-site at the Norfolk Southern Railroad Depot revealed no detection of perchloroethylene, or any other chlorinated solvent. Therefore, it is unlikely that perchloroethylene was disposed of on the ground or in the soil at this facility.

## 5. SURFACE WATER PATHWAY

### 5.1 Hydrologic Setting

A storm water line goes 1.4 miles northeast underneath the City of Fort Valley and then discharges

to Bay Creek, the surface water pathway probable point of entry (PPE). Bay Creek, with a flow rate less than 10 cubic feet per second, flows in a generally east-southeasterly direction approximately 11.9 miles before merging with Big Indian Creek. Big Indian Creek is a moderate size stream with an average flow rate of 86 cubic feet per second and an average low flow rate of 21 cubic feet per second (Reference 3). There has been no Flood Insurance Administration Map produced for the Fort Valley area. However, a Flood Hazard Rate Map has been produced for the area. The Flood Hazard Rate Map shows the site to be outside the 500-year floodplain (Reference 4).

## 5.2 Surface Water Targets

There are no drinking water intakes within 15 downstream miles (Fig. 2). It is likely some recreational fishing (brim and bass) occurs in the area where Bay Creek merges into Big Indian Creek. There is limited access to this area by the public; therefore, only the people whom own properties along the creeks have the opportunity to catch fish (Reference 5). The distance between the former dry-cleaning business and the fishery is approximately 13.3 miles. There are 8 miles of stream frontage wetlands located within 15 downstream miles of the site. The nearest wetland (approximately 50 acres, 0.5 mile frontage) is approximately 2.0 miles downstream from the site on Bay Creek (Reference 6).

Pursuant to the Georgia Endangered Wildlife Act of 1973 and the Federal Endangered Species Act of 1973, no wildlife is designated as a state and federally protected species (classified as endangered wildlife) whose range of habitats includes Peach and Houston Counties (Reference 7).

Pursuant to the Georgia Wildlife Preservation Act of 1973, Chamaecyparis thyoides (Linnaeus) Atlantic White Cedar, Nestronia umbellula (Rafinesque) Indian Olive, Sarracenia rubra (Walter) Sweet Pitcherplant and Trillium reliquum (Freeman) Relict Toadshade are designated as state protected species (classified threatened/endangered plants) whose range of habitat include Peach, Houston, Taylor, Talbot, Marion, Crawford, Muscogee, Macon and Schley Counties (Reference 8).

The above protected flora and fauna were not designated as terrestrial sensitive environments for the soil or air pathways due to the fact that none of the protected species were observed on-site or off-site during the reconnaissance.

## 5.3 Surface Water Sample Locations

No surface water samples were taken to identify a release to Bay Creek and Big Indian Creek. Probable point of entry (PPE) were chosen for Bay Creek and Big Indian Creek based on the surface runoff, topography of the area and the storm water line discharge.

## 5.4 Surface Water Conclusions

A potential release of contaminants to surface water is not suspected because of the distance to the PPE, and the lack of an identified source on site at the Norfolk Southern Railroad Depot. No drinking water intakes have been identified but sensitive environments (wetlands and fishery) have been identified. The surface water pathway is not of concern.

# 6. SOIL EXPOSURE AND AIR PATHWAYS

The primary pathway of concern at this site is the groundwater pathway. As a part of the groundwater investigation, soil samples were collected which were analyzed and found to contain low levels of toluene, p,m-xylene, and acetone. These constituents were found at depths of two feet or greater and are thus not available to surface or air exposure routes.

# 7. SUMMARY AND CONCLUSIONS

This investigation was conducted to evaluate this facility's potential as a source of the perchloroethylene contamination found in the nearby Fort Valley Municipal Wells 1 and 2. This investigation was conducted pursuant to CERCLA pre-remedial Site Inspection guidelines to evaluate the threat posed by the site to surrounding populations and sensitive environments via associated exposure routes.

The pathway of concern for this investigation is the groundwater pathway. Subsurface soil samples were collected at the site to determine is a release of perchloroethylene had occurred a the site, and if such a release has migrated to groundwater below the site.

A total of four subsurface soil samples were collected at the site. Collected samples were analyzed for volatile organic compounds (VOCs). Perchloroethylene was not detected in any of the four subsurface soil samples collected at the site.

No evidence was found that indicates that the Norfolk Southern Railroad Depot is a contributor to the PCE contamination in the Fort Valley Municipal Wells 1 and 2. It is recommended that no further CERCLA action be pursued at this time.

## REFERENCES


1. U.S.G.S. Topographic Map, 7.5 minute quadrangle, Sandersville 1962, photorevised 1985.

2. Fort Valley Phase I Investigation Plan; Task 1: Monitoring Well Installation and Sampling, Georgia Geologic Survey, September 12, 1997 Memorandum to William H. McLemore, State Geologist.

3. McFarlene, Roger, U.S. Geological Survey, Phone Call (770) 903-9100, 11 December 1997.

4. U.S. Department of Housing and Urban Development, Flood Hazard Rate Map of Peach County, Georgia, 25 June 1976.

5. Schleger, Steve, Georgia Department of Natural Resources, Wildlife Resources Division, Fort Valley, Phone Call (912) 825-6151, 12 December 1997.

6. U.S. Department of the Interior, Fish and Wildlife Service, National Inventory Maps of Georgia, Fort Valley West 1995; Fort Valley East 1995; Marshallville 1988; Perry West 1988; and Perry East 1988; scale: 1:24,000.

7. Odom, Ron R., Georgia's Protected Wildlife, Georgia Department of Natural Resources, Game and Fish Division, Endangered Wildlife Program, 15 September 1977.

8. Patrick, Thomas S., Protected Plants of Georgia, Georgia Department of Natural Resources, Wildlife Resources Division, Georgia Natural Heritage Program, 1995.

# OVERSIZED

# DOCUMENT

GEORGIA ENVIRONMENTAL PROTECTION DIVISION
HAZARDOUS WASTE MANAGEMENT BRANCH

CHAIN OF CUSTODY

FACILITY: Norfolk Southern Railroad Depot LOCATION: Fort Valley, Peach County, Georgia

| SAMPLE # | HWMB LOG # | LAB # | DESCRIPTION | COLLECTED BY (NAME) | DATE | TIME |
|---|---|---|---|---|---|---|
| 1A | 7795 | | Subsurface Soil, 0-4 ft. depth | S. White | 8/25/98 | 1200 |
| 1B | 7796 | | Subsurface Soil, 4-8 ft. depth | S. White | 8/25/98 | 1230 |
| 2A | 7797 | | Subsurface Soil, 0-4 ft. depth | S. White | 8/25/98 | 1300 |
| 2B | 7798 | | Subsurface Soil, 4-8 ft. depth | S. White | 8/25/98 | 1330 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

TRANSFER RECORD

| TRANSFERRED BY (NAME) | TO (NAME) (IF FINAL: LAB NAME) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (NAME) | DATE |
|---|---|---|---|---|---|---|
| S. White | EPD LAB | 8-26-98 | 9:20AM | HAND | Robert Price | 8-26-98 |
| | | | | | | |

ANALYSIS REQUESTED: VOCs (5035)

HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

# REQUEST FOR LABORATORY ANALYSIS

GHL

Facility Name/Location: Norfolk Southern RR Depot - Fort Valley

Sample Collected By/Phone: Steve White 657 8681

Georgia Dept. of Natural Resources

Collection Date: 8/25/98

Date Submitted To Lab: 8/26/98

LAB No. _____

HWMB LOG NUMBER: 7795

AC23619 Due date: 06/22/98

Date submitted: 08/26/98

sourceID: ADHOC NORFOLK SOUTHERN RR DEP HW7795

Sample collector: S WHITE

*(File a separate Request Sheet for each sample point)*

Analysis Needed By: Routine X Other (specify): _____

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | X | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

Concentration of Organics Requested (estimated): High ___ Low ___ Other (e.g., rinse blank - specify) _____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Subsurface soil #1A (0'-4' depth)

Applicable Hazardous Waste Codes (if known) _____ _____ _____

Special Precautions: _____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ |
| Volatiles | X |
| Pesticides | ___ |
| Herbicides | ___ |
| Organophosphorous Pesticides | ___ |
| PCB | ___ |
| BETX | ___ |
| Total Petroleum Hydrocarbon | ___ |

~~16 OZ. JARS~~ ___
~~8 OZ. JARS~~ ___
~~4 OZ. JARS~~ ___

1 4 OZ. JARS
___ 8 OZ. JARS
___ 16 OZ. JARS

Organics Special Request: 3-coolers

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

Additional Specific Organics For TCLP: _____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | _____ |
| Mercury | ___ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | [illegible] | Date: | 8/26 | Received By (EPD Lab): | R. Price |
| Approved By (HWMB): | [illegible] | Date: | 8/26 | Date (EPD Lab): | 8/26/98 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | S WHITE | **Sample ID :** | AC23619 |
| **Date Received:** | 08/26/98 | **Date Collected:** | 08/25/98 |
| **Time Received:** | 09:41 | **Time Collected:** | 12:00 |
| **Reporting Date:** | 08/31/98 | **DNR Lab Reference:** | HW7795 |
| **Sample Site:** | NORFOLK SOUTHERN RR DEP HW7795 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | ',1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | ı,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |



ʔAMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | ,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 38.7 | | ug/kg | SA1 | 08/26/98 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | ılorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 43.8 | | ug/kg | SA1 | 08/26/98 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |

**Sample ID : AC23619**



RAMETER CODE: EPA
. : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | .aphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 64.5 | USPEC | ug/kg | SA1 | 08/26/98 |
| | Total Hydrocarbon Fractions | | 8260 | -0- | 1550 TIE | | ug/kg | SA1 | 08/26/98 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SA1 | 08/26/98 |

**Sample comments :**

$8260S SMA 8-27-98 Surrogate recovery out of limits due to sample matrix effect

*End of Report*



RAMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# REQUEST FOR LABORATORY ANALYSIS

**GHL**

**Facility Name/Location:** Norfolk Southern RR Depot - Fort Valley

**Sample Collected By/Phone:** Steve White 657 8681

**Collection Date:** 8/25/98

Georgia Dept. of Natural Resources

**Date Submitted To Lab:** 8/26/98

**HWMB LOG NUMBER:** 7796

*(File a separate Request Sheet for each sample point)*

AC23620 Due date: 06/22/98
Date submitted: 08/26/98
sourceID: ADHOC NORFOLK SOUTHERN RR DEP HW7796
Sample collector: S WHITE

**Analysis Needed By:** Routine X Other (specify): ____

**Sample Description** (check one)

Waste ____ Soil/Sediment X Sludge ____

Ground Water ____ Surface Water ____ Drinking Water Well ____

Concentration of Organics Requested (estimated): High ____ Low ____ Other (e.g., rinse blank - specify) ____

**Describe Sample Including Source And Known Properties** (e.g., pH, concentration):

Subsurface soil #1B (5'-8' depth)

**Applicable Hazardous Waste Codes** (if known) ____ ____ ____

**Special Precautions:** ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

Semi-Volatiles (Acid & Base/Neutral) ____

Volatiles X

Pesticides ____

Herbicides ____

Organophosphorous Pesticides ____

PCB ____

BETX ____

Total Petroleum Hydrocarbon ____

1 4 OZ. JARS
____ 8 OZ. JARS
____ 16 OZ. JARS

3 - encores

Organics Special Request: ____

### 2. TOTAL METALS

ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____

Mercury ____

Metals Special Request: ____

### 3. TCLP ORGANICS

Volatiles ____ Pesticides ____

Semi-Volatiles (Acid & Base/Neutral) ____ Herbicides ____

Additional Specific Organics For TCLP: ____

### 4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ Additional Metals For TCLP: ____

Mercury ____

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): ____

Reviewed By (HWMB): [signature] Date: 8/26 Received By (EPD Lab): R. Price

Approved By (HWMB): [signature] Date: 8/26 Date (EPD Lab): 8/26/98

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | S WHITE | **Sample ID :** | AC23620 |
| **Date Received:** | 08/26/98 | **Date Collected:** | 08/25/98 |
| **Time Received:** | 09:41 | **Time Collected:** | 12:30 |
| **Reporting Date:** | 08/31/98 | **DNR Lab Reference:** | HW7796 |
| **Sample Site:** | NORFOLK SOUTHERN RR DEP HW7796 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | ',1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | 1097 | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |



'AMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | 583 | | ug/kg | SA1 | 08/26/98 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | ,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Acetone | 75059 | 8260 | 100 | 132 | | ug/kg | SA1 | 08/26/98 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 43.7 | | ug/kg | SA1 | 08/26/98 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | ılorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 47.6 | | ug/kg | SA1 | 08/26/98 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Ethylbenzene | 34374 | 8260 | 5 | 34.2 | | ug/kg | SA1 | 08/26/98 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Isopropylbenzene | 77223 | 8260 | 5 | 63.3 | | ug/kg | SA1 | 08/26/98 |
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |

**Sample ID : AC23620**



?AMETER CODE: EPA
: micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | n-Propylbenzene | 77224 | 8260 | 5 | 130 | | ug/kg | SA1 | 08/26/98 |
| | Naphthalene | 34445 | 8260 | 5 | 490 | | ug/kg | SA1 | 08/26/98 |
| | o-Xylene | 78362 | 8260 | 5 | Trace | | ug/kg | SA1 | 08/26/98 |
| | p,m-Xylene | 45510 | 8260 | 5 | Trace | | ug/kg | SA1 | 08/26/98 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | 158 | | ug/kg | SA1 | 08/26/98 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | 170 | | ug/kg | SA1 | 08/26/98 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 54.9 | | ug/kg | SA1 | 08/26/98 |
| | Total Hydrocarbon Fractions | | 8260 | -0- | 2940 TIE | | ug/kg | SA1 | 08/26/98 |
| | Total Substituted Benzenes | | 8260 | -0- | 2564 TIE | | ug/kg | SA1 | 08/26/98 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SA1 | 08/26/98 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# REQUEST FOR LABORATORY ANALYSIS

GHL

Facility Name/Location: Norfolk Southern RR Depot - Fort Valley

Sample Collected By/Phone: Steve White 657 8681

Collection Date: 8/25/98

Date Submitted To Lab: 8/26/98

HWMB LOG NUMBER: 7797

*(File a separate Request Sheet for each sample point)*

Georgia Dept. of Natural Resources

LAB No. _____

AC23621 Due date: 06/22/98

Date submitted: 08/26/98

SourceID: ADHOC NORFOLK SOUTHERN RR DEP HW7797

~~Sample collector: S WHITE~~

Analysis Needed By: Routine X Other (specify): _____

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | X | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

Concentration of Organics Requested (estimated): High ___ Low ___ Other (e.g., rinse blank - specify) _____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Subsurface soil #2A (0'-4' depth)

Applicable Hazardous Waste Codes (if known) _____ _____ _____

Special Precautions: _____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

| | | |
|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ | |
| Volatiles | X | 1 4 OZ. |
| Pesticides | ___ | ___ 8 OZ. J. |
| Herbicides | ___ | ___ 16 OZ. JARS |
| Organophosphorous Pesticides | ___ | |
| PCB | ___ | 3-encores |
| BETX | ___ | |
| Total Petroleum Hydrocarbon | ___ | |

Organics Special Request: _____

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

Additional Specific Organics For TCLP: _____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | [signature] | Date: | 8/26 | Received By (EPD Lab): | R. Price |
| Approved By (HWMB): | [signature] | Date: | 8/26 | Date (EPD Lab): | 8/26/98 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | S WHITE | **Sample ID :** | **AC23621** |
| **Date Received:** | 08/26/98 | **Date Collected:** | 08/25/98 |
| **Time Received:** | 09:41 | **Time Collected:** | 13:00 |
| **Reporting Date:** | 08/31/98 | **DNR Lab Reference:** | HW7797 |
| **Sample Site:** | NORFOLK SOUTHERN RR DEP HW7797 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | ',1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |



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mg/l : milligrams/liter
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Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | .,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 48.2 | | ug/kg | SA1 | 08/27/98 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | ılorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 48.9 | | ug/kg | SA1 | 08/27/98 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |

**Sample ID : AC23621**



RAMETER CODE: EPA
, : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 54.1 | | ug/kg | SA1 | 08/27/98 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/27/98 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SA1 | 08/27/98 |

**Sample comments :**

*End of Report*



RAMETER CODE: EPA
ı : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# REQUEST FOR LABORATORY ANALYSIS

GHL

**Facility Name/Location:** Norfolk Southern RR Depot - Fort Valley

**Sample Collected By/Phone:** Steve White 657 8681

Georgia Dept. of Natural Resources

**Collection Date:** 8/25/98

**Date Submitted To Lab:** 8/26/98

**LAB No.** _____

**HWMB LOG NUMBER:** 7798

*(File a separate Request Sheet for each sample point)*

AC23623 Due date: 06/22/98
Date submitted: 08/26/98
sourceID: ADHOC NORFOLK SOUTHERN RR DEP HW/7798
Sample collector: S WHITE

**Analysis Needed By:** Routine X Other (specify):

**Sample Description** (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | X | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

**Concentration of Organics Requested (estimated):** High ___ Low ___ Other (e.g., rinse blank - specify) _____

**Describe Sample Including Source And Known Properties** (e.g., pH, concentration):

Subsurface soil #2B (5'-8' depth)

**Applicable Hazardous Waste Codes** (if known) _____ _____ _____

**Special Precautions:** _____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ |
| Volatiles | X |
| Pesticides | ___ |
| Herbicides | ___ |
| Organophosphorous Pesticides | ___ |
| PCB | ___ |
| BETX | ___ |
| Total Petroleum Hydrocarbon | ___ |

1 4 OZ. JARS
___ 8 OZ. JARS
___ 16 OZ. JARS
3-encores

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

Organics Special Request: _____

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

Additional Specific Organics For TCLP: _____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | [signature] | Date: | 8/26 | Received By (EPD Lab): | R. Price |
| Approved By (HWMB): | [signature] | Date: | 8/26 | Date (EPD Lab): | 8/26/98 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | S WHITE | **Sample ID :** | AC23623 |
| **Date Received:** | 08/26/98 | **Date Collected:** | 08/25/98 |
| **Time Received:** | 09:41 | **Time Collected:** | 13:30 |
| **Reporting Date:** | 08/31/98 | **DNR Lab Reference:** | HW7798 |
| **Sample Site:** | NORFOLK SOUTHERN RR DEP HW7798 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |



RAMETER CODE: EPA
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|---|---|---|
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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | ,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 49.1 | | ug/kg | SA1 | 08/26/98 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | hlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 48.0 | | ug/kg | SA1 | 08/26/98 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |

**Sample ID : AC23623**



RAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | .Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 53.9 | | ug/kg | SA1 | 08/26/98 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SA1 | 08/26/98 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SA1 | 08/26/98 |

**Sample comments :**

*End of Report*



RAMETER CODE: EPA
µg/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# UNSCANNABLE

# MEDIA

# (PHOTOGRAPHS)

# REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV



**EPA ID:** GASFN0406880 **Site Name:** NORFOLK SOUTHERN RAILROAD DEPOT **State ID:**

**Alias Site Names:**

**City:** FORT VALLEY **County or Parish:** PEACH **State:** GA

**Refer to Report Dated:** 02/19/98 **Report Type:** PRELIMINARY ASSESSMENT 001

**Report Developed by:**

**DECISION:**

- [ ] **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**
  - [ ] **1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)**
  - [ ] **1b. Site may qualify for action, but is deferred to:**
- [X] **2. Further Assessment Needed Under CERCLA:**
  - **2a. Priority:** [X] **Higher** [ ] **Lower**
  - **2b. Other: (recommended action)**

**DISCUSSION/RATIONALE:**

Since PCE has been detected in two municipal wells in Fort Valley, Georgia, a Site Inspection is necessary to determine if this site is a source of PCE.

**Site Decision Made by:** ALAN W. YARBROUGH

**Signature:** Alan W. Yarbrough **Date:** 10/22/98

**EPA Form # 9100-3**

## SUMMARY PRELIMINARY ASSESSMENT

**Date:** February 19, 1998

**Site Information:**

Norfolk Southern Railroad Depot
200 East Main Street (office)
Fort Valley, Georgia 31030
Latitude: 32° 33' 7.2" N
Longitude: 83° 53' 8.5" W

**Directions to the Site:**

From Atlanta, take I-75 South through Macon. Exit SR 96 to the right, in Peach County. Fort Valley is approximately 10 miles east of I-75 on SR 96. The Norfolk Southern Railroad Depot is located on Railroad Street, just south of East Main Street in downtown Fort Valley.

**Site Location:** See figure.

**Site Description, Operational History and Waste Characteristics:**

Norfolk Southern operates a railway and owns an old railroad depot within 500 feet and 1,000 feet of Fort Valley Municipal Well #1 and Fort Valley Municipal Well #2, respectively. No evidence of solvents was noted at the railroad depot. Norfolk Southern has not yet responded to a written request sent to Mr. Joe Genette on October 16, 1996 asking for information on any chemicals stored, used or spilled within the wellhead protection areas of Fort Valley Municipal Well #1 and Fort Valley Municipal Well #2. Any releases at or in the vicinity of the depot would be within the capture zones of both Fort Valley Municipal Wells #1 and #2[1].

It has not been determined if a release has occurred at this site. The location of this site is within the likely capture area of Fort Valley Municipal Well #1. PCE has been detected above detection limits in Fort Valley Municipal Wells #1, #2 and #5. This site is within the wellhead protection areas of Municipal Wells #1, #2 and #5.

**Recommendations:**

A Sampling Site Inspection (SSI) should be conducted at this site to determine if a release has occurred at the site and if such a release has migrated off-site to the nearby municipal wells.

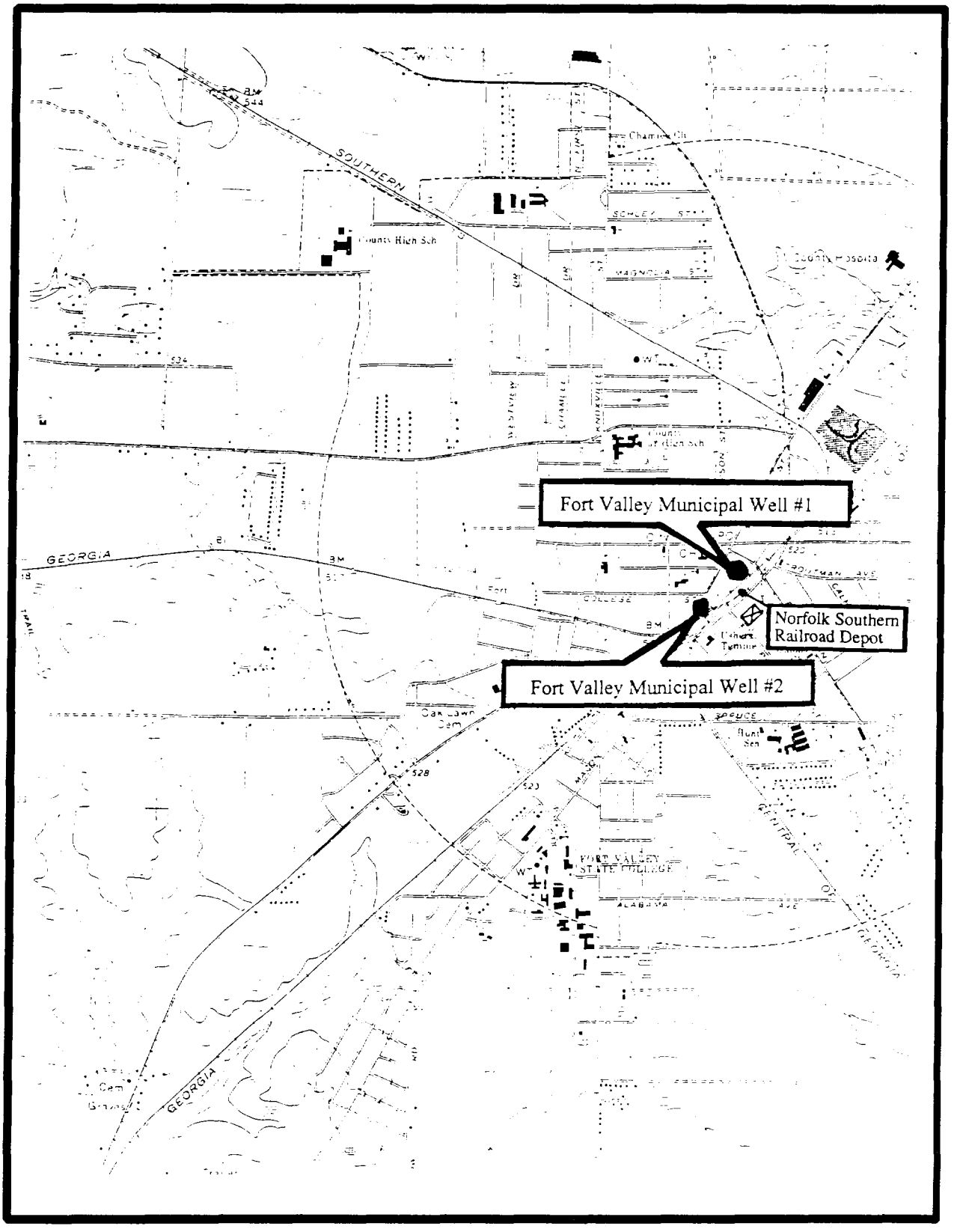
**Investigator:**

Steve White
Environmental Specialist
Hazardous Waste Management Branch
Georgia Environmental Protection Division
Phone: 404-656-2833

---

[1] Georgia Wellhead Protection Plan for City of Fort Valley, Peach County, Permit #2250001, Expiration Date: July 27, 2001.

**Figure. Location of the Fort Valley Norfolk Southern Railroad Depot in relation to Fort Valley Municipal Wells #1 and #2.**



Georgia Department of Natural Resources
205 Butler Street, S.E., Suite 1162, Atlanta, Georgia 30334

**FAX COVER LETTER**

**FAX NO: (404) 651-9425**

Date: **August 13, 1998**

Please deliver the following pages to:

Name: **Alan Yarbrough**

Organization: **EPA**

Phone: **404-562-8930** Fax: **404-562-8896**

Sent By:

Name: Steve White

Organization: Ga EPD - Hazardous Waste

Phone: 404/657-8681 Fax: 404/651-9425

This transmission is a total of 11 pages, with this cover letter being page one. If you do not receive all pages or if problems arise during transmission, please call.

☐ Written confirmation of receipt required.

☐ Verbal confirmation of receipt required. Our phone number is (404) 656-2833.

☐ Confirmation of receipt is not required.

***Alan,***

***This is the Sampling Plan for Norfolk Southern Railroad Depot in Fort Valley. I plan on sampling the site on August 25th. Let me know if you have any comments. Thanks.***

***Steve White***
***EPD - HWMB***

# SITE INSPECTION SAMPLE PLAN

**Norfolk Southern Railroad Depot**
**Fort Valley, Peach County, Georgia**
**EPA ID No. *(to be assigned)***

**August 1998**

**Prepared by:**

**STEVE WHITE**
**ENVIRONMENTAL SPECIALIST**
**HAZARDOUS WASTE MANAGEMENT BRANCH**
**GEORGIA ENVIRONMENTAL PROTECTION DIVISION**

# TABLE OF CONTENTS

page

1. INTRODUCTION ..... 1

2. SITE DESCRIPTION ..... 1
   2.1 Location ..... 1
   2.2 Directions to the Site ..... 1
   2.3 Operational History and Waste Characteristics ..... 1

3. COLLECTION OF NON-SAMPLING DATA ..... 2

4. SAMPLING ACTIVITIES ..... 2
   4.1 Subsurface Soil Sampling ..... 2
   4.2 Quality Assurance ..... 2
   4.3 Quality Control Procedures ..... 4

5. INVESTIGATION-DERIVED WASTES PLAN ..... 4

6. PROJECT MANAGEMENT ..... 4
   6.1 Field Equipment/Health and Safety ..... 4
   6.2 Project Schedule ..... 5

LIST OF FIGURES AND TABLE:

Figure: Site Layout and Sample Locations

Table: Sample Number, Location and Description

APPENDICES:

Appendix A: Equipment List
Appendix B: Site Safety Plan

REFERENCES

# 1. INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Georgia Environmental Protection Division will conduct a Site Inspection (SI) at the Norfolk Southern Railroad Depot site in Fort Valley, Peach County, Georgia. The SI will investigate the threat to human health and the environment posed by the site. The scope of the investigation will include collecting media samples to investigate migration of hazardous substances from the site.

# 2. SITE DESCRIPTION

## 2.1 Location

The Norfolk Southern Railroad Depot is located at 200 East Main Street (office) in downtown Fort Valley. The geographic coordinates are 32° 33' 7.2" N Latitude, 83° 53' 8.5" W Longitude (Reference 1).

The area is characterized by a mild climate. Summers are hot and humid with daily temperatures reaching 95° F or higher. The winters are generally mild with daily minimum temperatures as low as 32° F. Mean annual precipitation is nearly 49 inches (Reference 2).

## 2.2 Directions to the Site

From Atlanta, take I-75 South through Macon. Exit SR 96 to the right, in Peach County. Fort Valley is approximately 10 miles east of I-75 on SR 96.

## 2.3 Operational History and Waste Characteristics

Norfolk Southern operates a railway and owns an old railroad depot within 500 feet and 1,000 feet of Fort Valley Municipal Well #1 and Fort Valley Municipal Well #2, respectively. No evidence of solvents was noted at the railroad depot. Norfolk Southern has not yet responded to a written request sent to Mr. Joe Genette on October 16, 1996 asking for information on any chemicals stored, used or spilled within the wellhead protection areas of Fort Valley Municipal Well #1 and Fort Valley Municipal Well #2. Any releases at or in the vicinity of the depot would be within the capture zones of both Fort Valley Municipal Wells #1 and #2.

It has not been determined if a release has occurred at this site. The location of this site is within the likely capture area of Fort Valley Municipal Well #1. PCE has been detected above detection limits in Fort Valley Municipal Wells #1, #2 and #5. This site is within the wellhead protection areas of Municipal Wells #1, #2 and #5.

## 3. COLLECTION OF NON-SAMPLING DATA

Non-sampling data collection activities will include verifying population and environmental information as well as acquiring additional information. The site will be visually inspected to determine the extent of contamination and location of wetlands, and migration routes from the site. The SI will investigate if Federal or State designated endangered or threatened species live on site or could potentially inhabit the area.

## 4. SAMPLING ACTIVITIES

The objectives of the SI are to collect analytical data to identify hazardous substances at the site and investigate whether hazardous substances have been released to the environment and whether the substances have impacted human health and the environment. The plan calls for sampling of subsurface soils on and off site at the Norfolk Southern Railroad Depot site. These samples will be collected to provide information necessary to assess whether or not PCE has been disposed of on the ground at this site at some point during its historical operation.

### 4.1 Subsurface soil sampling

Three (3) subsurface soil samples will be collected on-site using a GeoProbe truck mounted subsurface soil sampler. These samples will be collected in areas outside the facility in areas where it is possible that PCE could have been spilled or disposed of during the time the facility was in operation. One (1) background subsurface soil sample will be collected using the same method in an area off site, and unlikely to be affected by the operation of the facility. Collected samples will be analyzed for Volatile Organic Compounds.

### 4.2 Quality Assurance

Quality Assurance and quality control (QA/QC) for this sampling event will be provided by duplicate samples. For volatile analysis, a trip blank will accompany field samples.

All sample collection, preservation, QA/QC preparation of duplicates, and chain-of-custody procedure used during the sampling activities will be in accordance with the standard operating procedures (SOPs) specified in the *Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual*, U.S. Environmental Protection Agency, Environmental Services Division, Region IV, Athens, Georgia, May 1996.

Figure. Downtown Fort Valley, Georgia; showing location of the Norfolk Southern Railroad Depot with proposed sample locations.

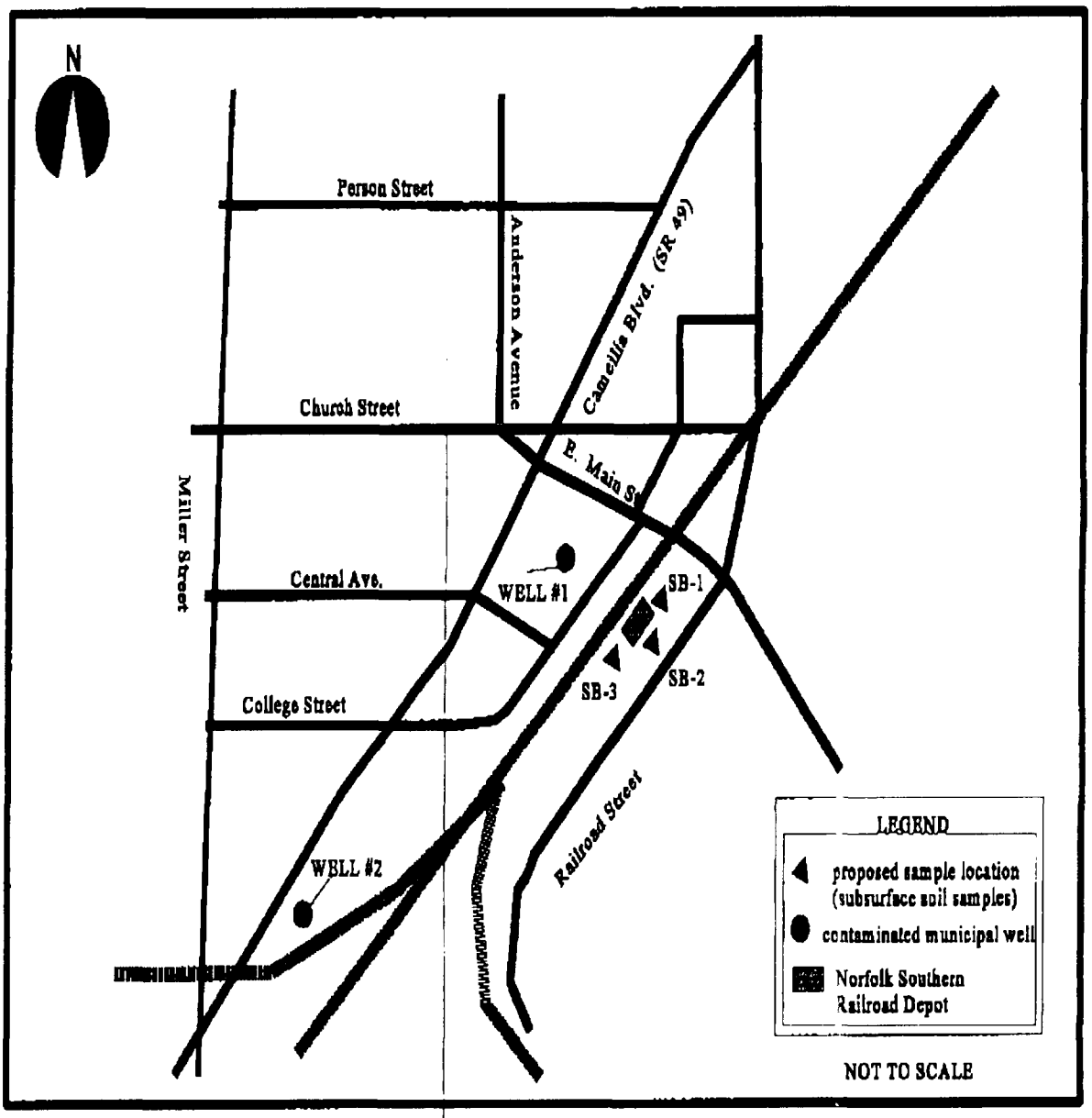


Table. Norfolk Southern Railroad Depot; Sample Number, Location and Description.

| Sample Number | Location | Description |
|---|---|---|
| SB-1 | At front of facility near loading dock in parking lot area. | Subsurface soil collected on site at a depth of 4 and 8 feet. |
| SB-2 | Along the side of the facility between the tracks and the building. | Subsurface soil collected on site at a depth of 4 and 8 feet. |
| SB-3 | At rear of facility, outside the back entrance near rear parking area. | Subsurface soil collected on site at a depth of 4 and 8 feet. |

Field work will begin with a site reconnaissance in the morning to verify that planned sample locations are appropriate and accessible. A drive-by survey will verify the location of wetlands, the closest residence, and the population within approximately 0.25 miles of the site. If necessary, original plans will be modified. Upon collection, all samples will be prepared and packaged for transport to the EPD laboratory in Atlanta. Sampling will start after the original sample plan and any necessary modifications are confirmed. Proposed sample locations are shown on the figure.

### 4.3 Quality Control Procedures

All sampling will be performed with dedicated sampling equipment. Each soil sample will be taken using a laboratory decontaminated scoop. All samples will be stored in coolers on ice until they reach the laboratory. Chain-of-custody will be maintained according to EPD SOP No. 4.2, by field personnel until samples are handed over to the EPD Laboratory in Atlanta.

## 5. INVESTIGATION-DERIVED WASTES PLAN

Investigation-derived wastes include personal protective equipment, disposable sampling equipment, and soil not collected as a sample. Reusable personal protective equipment will be decontaminated. All disposable personal protective and sampling equipment will be double-bagged and deposited off site at the EPD Laboratory. Soil not collected as a sample will be returned to the ground at the sample point.

## 6. PROJECT MANAGEMENT

The project manager for the Norfolk Southern Railroad Depot SI, Steve White, will schedule field activities and personnel requirements, verify site access authority, direct and oversee all on site and off site activities associated with the investigation. The project manager also will document and manage all collected samples. The project safety officer

is also Steve White. Team members will collect and prepare samples and support all other field operations as required.

## 6.1 Field Equipment/Health and Safety

Safety monitoring equipment will be a HNu meter. Field respiratory protection will be Level D. If volatile contaminants are detected and/or air-borne dust levels increase significantly, sampling will continue at Level C. Off site sampling will be conducted at Level D protection. Field dress for the reconnaissance will include steel-toe work boots, disposable gloves, and hard hat. For sampling, disposable gloves will be worn. Other items required for this investigation include sample containers and sampling tools. A complete equipment list is provided as Appendix A.

## 6.2 Project Schedule

The project is expected to start in July 1998 and end by September 1998. Non-sampling data collection will begin in July and continue through September 1997. The SI field work will take place the week of July 20-24, 1998. When the field tasks are completed, preparation of the draft SI report will begin. Analytical results will be reviewed by the middle of August, and the final SI report and HRS score will be completed by the end of September 1998.

## Appendix A

**EQUIPMENT LIST:**

GeoProbe Truck
GeoProbe sampling equipment
Tyvek
Hard hats
Full Face Respirators
Dust Cartridges (Respirator)
Disposable Gloves
Trash Bags
Tape
Cooler
Sample Bottles
Ice
Field Book
Sample Bottle Labels
Custody Sheets
Wading Boots
Dedicated Sampling Scoops
Steel-toe Work Boots
Camera and film
Safety Glasses/Goggles
Decon bucket and brush
Deionized water and alconox for decontamination

## Appendix B

**SITE SAFETY CHECKLIST:**

**Site Name:** Norfolk Southern Railroad Depot
**Address:** Peach County, Fort Valley, Georgia

**Type Of Investigation:** Site Inspection (SI)

**Personnel Log:**

| NAME | RESPONSIBILITY | ACKNOWLEDGEMENT OF FAMILIARITY WITH SITE SAFETY PLAN (INITIAL) | SUPERVISOR APPROVAL |
|---|---|---|---|
| Steve White | Project Manager | | |
| | | | |
| | | | |
| | | | |
| | | | |

*SITE SAFETY PLAN CONSISTS OF THIS AND ALL ATTACHED PAGES.

| EMERGENCY AND HAZARD INFORMATION | DESCRIPTION |
|---|---|
| **SPECIAL ACCESS REQUIREMENTS:** | none |
| **EMERGENCY PHONE NUMBERS:** | 911 system in this area |
| **POTENTIAL HAZARDS DESCRIPTION:** | uneven terrain, insect bites, snakes, volatile organic compounds (potential) |
| **PERSONAL PROTECTIVE EQUIPMENT (PPE) TO BE UTILIZED:** | steel-toe boots, hard hat, safety glasses, latex gloves (when sampling) and hearing protection (if necessary) |

## REFERENCES

1. United States Geologic Survey, 7.5 Minute Series Topographic Map, Fort Valley West Quadrangle, Georgia, 1973.

2. Average Annual Rainfall and Runoff in Georgia, 1941-1970, Robert Carter and Harold Stiles, Georgia Geologic Survey, 1983, Hydrologic Atlas 9.

# REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV



**EPA ID:** GASFN0406881 **Site Name:** PEACH MAXIMUM AUTO CARE (PEACH MAC) **State ID:** 34802

**Alias Site Names:**

**City:** FORT VALLEY **County or Parish:** PEACH **State:** GA

**Refer to Report Dated:** 09/01/1999 **Report Type:** SITE INSPECTION 001

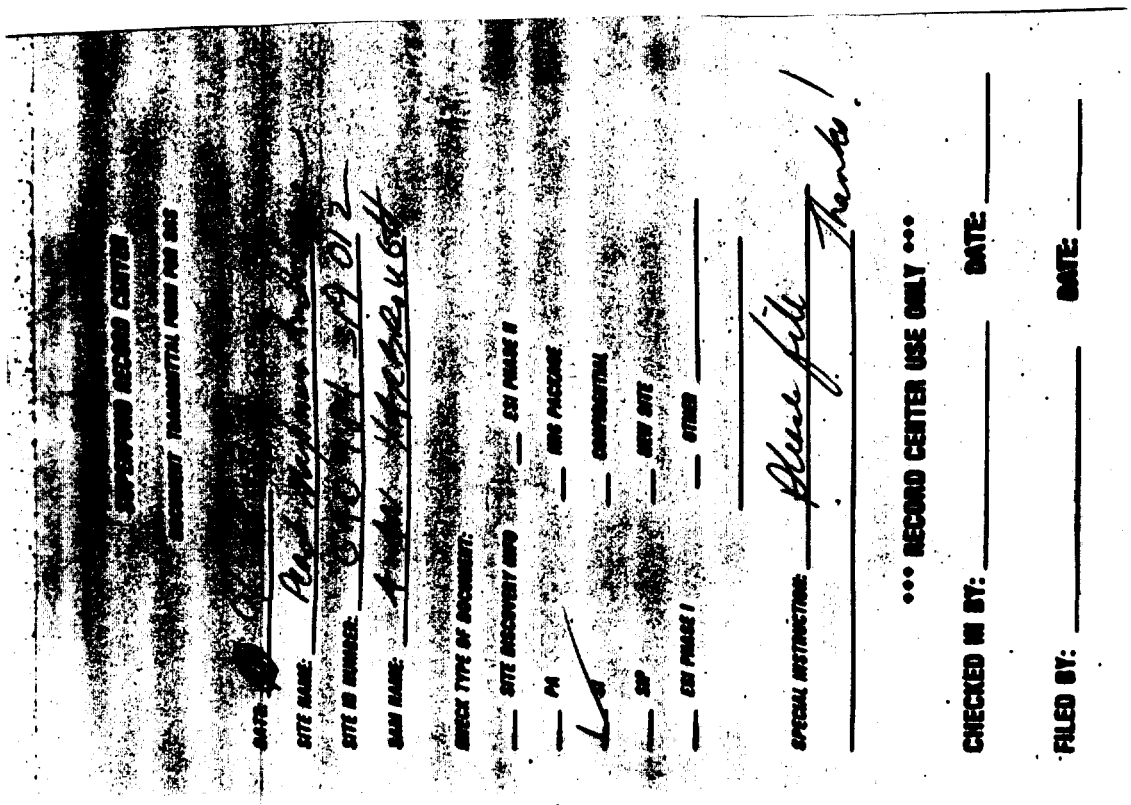
**Report Developed by:** STATE

**DECISION:**

- [X] **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**
  - [X] **1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)**
  - [ ] **1b. Site may qualify for action, but is deferred to:**
- [ ] **2. Further Assessment Needed Under CERCLA:**
  - **2a. Priority:** [ ] **Higher** [ ] **Lower**
  - **2b. Other: (recommended action)** NFRAP (No Futher Remedial Action Planned

**DISCUSSION/RATIONALE:**

Tetrachloroethylene was not detected above quantitation limits in any of the four subsurface soil samples from this site. No source areas were found onsite. The draft HRS score is 0.0. The site is being NFRAPed at this time.




**Site Decision Made by:** ALAN W. HAREROUGH

**Signature:** _____ **Date:** 01/07/1999

**EPA Form # 9100-3**

# SITE INSPECTION REPORT

# FOR

# PEACH MAXIMUM AUTO CARE
# FORT VALLEY, PEACH COUNTY, GEORGIA

## EPA ID NUMBER: GAD984319012


**Prepared By:**

**Kenneth Grall**
**Principal Environmental Engineer**
**Georgia Environmental Protection Division**
**Hazardous Waste Management Branch**


**September 1998**

TABLE OF CONTENTS


| | | Page |
|---|---|---|
| 1. | INTRODUCTION | 1 |
| 2. | SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS | 1 |
| | 2.1 Location | 1 |
| | 2.2 Site Description, Operational History and Waste Characteristics | 1 |
| 3. | SUBSURFACE SOIL SAMPLING | 2 |
| | 3.1 Analytical Results | 2 |
| | 3.2 Conclusions | 2 |
| 4. | GROUND WATER PATHWAY | 2 |
| | 4.1 Hydrogeology | 2 |
| | 4.2 Ground Water Targets | 3 |
| | 4.3 Sample Locations | 3 |
| | 4.4 Ground Water Pathway Conclusions | 3 |
| 5. | SURFACE WATER PATHWAY | 3 |
| | 5.1 Hydrologic Setting | 3 |
| | 5.2 Surface Water Targets | 4 |
| | 5.3 Surface Water Sample Locations | 4 |
| | 5.4 Surface Water Conclusions | 5 |
| 6. | SOIL EXPOSURE AND AIR PATHWAYS | 5 |
| 7. | SUMMARY AND CONCLUSIONS | 5 |

TABLE 1 Sample Analysis Results
TABLE 2 Drinking Water Usage

APPENDIX A Topographic Map
APPENDIX B Photographs
APPENDIX C Site Map
APPENDIX D 1967 Aerial Photograph
APPENDIX E 1980 Aerial Photograph
APPENDIX F 1990 Aerial Photograph
APPENDIX G EPA Form 8700-12 - Notification of Regulated Waste Activity
APPENDIX H 1995 and 1998 Hazardous Waste Generator Inspection Reports
APPENDIX I Property Deed and Tax Record
APPENDIX J Georgia Wellhead Protection Plan for City of Fort Valley, Peach County
APPENDIX K Memorandum: Preliminary Identification of Potential Sources of PCE in Fort Valley Municipal Wells 1 and 2
APPENDIX L Fort Valley Phase I Investigation Plan, Georgia Geologic Survey, September 12, 1997
APPENDIX M Geologic Survey Well Map
APPENDIX N Sampling Plan
APPENDIX O Analytical Results, Chain of Custody, and Analysis Request Forms
APPENDIX P CENTRACTS Report
APPENDIX Q Water Supply Well Map
APPENDIX R Fort Valley Utilities Commission City Sewer System Flow Map
APPENDIX S 15 mile Surface Water Downstream Pathway Map

Date: September 1998

Prepared by: Kenneth Grall
Principal Environmental Engineer
Hazardous Waste Management Branch
Georgia Environmental Protection Division

## 1. INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Georgia Environmental Protection Division conducted a Site Inspection (SI) at the Peach Maximum Auto Care (Peach MAC) site in Peach County, Georgia. The purpose of this investigation was to collect information concerning conditions at the Peach MAC site sufficient to assess the threat posed to human health and the environment and to determine the need for additional CERCLA/SARA or other appropriate action. The scope of the investigation included a review of available file information, a comprehensive target survey, and an on-site and off-site sampling reconnaissance.

## 2. SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

### 2.1 Location

The Peach MAC site is located in Fort Valley, Peach County, Georgia at the intersection of South Camellia Boulevard and Central Avenue. The geographical coordinates are 32° 33' 8.5" North Latitude; 83° 53' 15.0" West Longitude, as shown on the United States Geological Survey (U.S.G.S.) Fort Valley West Quadrangle Topographic Map for Georgia (Reference 1).

### 2.2 Site Description, Operational History and Waste Characteristics

On December 29, 1992 Peach MAC notified as a small quantity generator of hazardous waste. The notification indicated the facility generates D001 (ignitable) and D008 (lead) wastes. During an October 31, 1995 compliance evaluation inspection it was noted the facility was generating D001 (ignitable) and D039 (PCE) hazardous wastes. During a March 26, 1998 multimedia inspection it was noted Peach MAC has generated D001 (ignitable), D006 (cadmium), D008 (lead), D018 (benzene), D027 (1,4-dichlorobenzene), D039 (tetrachloroethylene), and D040 (trichloroethylene).

According to the manager the current automobile repair business has occupied the building for the last 16 years. Solvents are used at Safety Kleen parts cleaning stations. The solvent supplied by Safety Kleen is 85% mineral spirits and contains less than 0.5% tetrachloroethylene. The building is approximately 35 years old and prior to being occupied by Peach MAC the facility was a tire store and automobile repair facility.

PCE has been found above detection limits in Fort Valley Municipal Water Supply Wells 1 and 2. The site is within the outer-management zone of the wellhead protection areas for both Municipal Wells 1 and 2.

## 3. SUBSURFACE SOIL SAMPLING

Attachment 3 shows the location of the four subsurface soil samples collected a the site. The four soil samples were collected from two sample points at depths of 0-4 foot, and 4-8 foot using a Geoprobe. The collection of soil samples was conducted according to SW846 Method 5035 using EnCore samplers. All samples were analyzed for volatile organics compounds using SW846 Method 8260.

### 3.1 Analytical Results

Table 1 below shows a list of constituents that were detected in the subsurface soil samples collected at the site.

**Table 1. Sample Analysis Results**

| CONSTITUENT | SAMPLE LOCATION #1 | | SAMPLE LOCATION #2 | |
|---|---|---|---|---|
| | 7740 | 7741 | 7742 | 7743 |
| Sample Depth | 0-4 feet | 4-8 feet | 0-4 feet | 4-8 feet |
| Tetrachloroethylene | Non Detect | Non Detect | Trace | Trace |

### 3.2 Conclusions

Tetrachloroethylene (PCE) was not detected above the quantitation limit of 5 µg/kg in any of the samples collected during this evaluation. Samples 7742 and 7743 contain a trace amount of PCE below what can reliably be quantified at 5 µg/kg.

## 4. GROUND WATER PATHWAY

### 4.1 Hydrogeology

The City of Fort Valley is located in the Fort Valley Plateau District of the Coastal Plain physiographic province. The dominant feature of the Fort Valley Plateau District is a broad, flat topped topography with fewer streams and less local relief than adjacent districts. The City of Fort Valley is located in an outcrop area of the Lower Paleocene Clayton formation which consists of sandy brick-red clay and fine to coarse grained sand. The Clayton formation is underlain by the Providence Sand, Providence-Ripley-Cusetta, Blufftown-Eutaw, and Tuscaloosa formations. The shallow most aquifer is the Clayton (or perched) aquifer which is composed 10-35 feet of silty fine sand. The Clayton aquifer is

overlain by 10-15 feet of soil and a sandy clay unit, and underlain by an aerially extensive kaolin layer which ranges in thickness from 2-20 feet. Ground water in the Clayton aquifer is under water table conditions, and depth to ground water in this aquifer is approximately 25-30 feet below land surface. The deepest aquifer in Fort Valley is the Tuscaloosa aquifer which occurs at a depth of about 250 feet below land surface. This aquifer is overlain by the Ripley/Blufftown - Eutaw semiconfining unit and ground water in the Tuscaloosa aquifer occurs under confined conditions. The Tuscaloosa aquifer is the primary source of ground water to the high capacity wells in the area including Fort Valley Municipal Water Supply Wells 1, 2 and 5 (Reference 2).

### 4.2 Ground Water Targets

Table 2 shows the drinking water populations from public and private sources.

**Table 2. Drinking water usage.**

| Water Usage | Distance From Site (miles) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0-.25 | .25-.50 | .50-1.0 | 1.0-2.0 | 2.0-3.0 | 3.0-4.0 | Total |
| Total Population | 52 | 112 | 658 | 2232 | 3330 | 3372 | 9756 |
| Population on Private Wells | 3 | 10 | 35 | 234 | 396 | 437 | 1115 |
| Population on Public Water | 49 | 102 | 623 | 1998 | 2934 | 2935 | 8641 |

### 4.3 Sample Locations

Ground water samples were collected during a separate sampling event following the installation of five ground water monitoring wells in downtown Fort Valley. Well installation and sampling will be conducted pursuant to the Georgia Geologic Survey, Fort Valley Phase I Investigation Plan (Attached) Reference 3.

### 4.4 Ground Water Pathway Conclusions

It is unlikely that the PCE contamination found in Fort Valley Municipal Water Supply Wells 1 and 2 is the result of activities at the Peach MAC site. Analysis of subsurface soil samples collected on-site at Peach MAC revealed no presence of PCE above quantitation limits, nor any other chlorinated solvent.

## 5. SURFACE WATER PATHWAY

### 5.1 Hydrologic Setting

The automobile repair facility is located next to the street with an asphalt paved parking lot located directly in front of the building. Overland drainage from the site, during extremely wet periods, flows north to Central Avenue and southeast to Camellia Boulevard (Reference 4) where it enters city storm drains. The storm water line goes 1.4 miles northeast underneath the City of Fort Valley and then discharges to Bay Creek, the surface water pathway probable point of entry (PPE). Bay Creek, with a flow rate less than 10 cubic feet per second, flows in a generally east-southeasterly direction approximately 11.9 miles before merging with Big Indian Creek. Big Indian Creek is a moderate size stream with an average flow rate of 86 cubic feet per second and an average low flow rate of 21 cubic feet per second (Reference 5). There has been no Flood Insurance Administration Map produced for the Fort Valley area. However, a Flood Hazard Rate Map has been produced for the area. The Flood Hazard Rate Map shows the site to be outside the 500-year floodplain (Reference 6).

## 5.2 Surface Water Targets

There are no drinking water intakes within 15 downstream miles (Figure 2). It is likely some recreational fishing (brim and bass) occurs in the area where Bay Creek merges into Big Indian Creek. There is limited access to this area by the public; therefore, only the people whom own properties along the creeks have the opportunity to catch fish (Reference 7). The distance between Peach MAC and the fishery is approximately 13 miles. There are 8 miles of stream frontage wetlands located within 15 downstream miles of the site. The nearest wetland (approximately 50 acres, 0.5 mile frontage) is approximately 2.0 miles downstream from the site on Bay Creek (Reference 8).

Pursuant to the Georgia Endangered Wildlife Act of 1973 and the Federal Endangered Species Act of 1973, no wildlife is designated as a state and federally protected species (classified as endangered wildlife) whose range of habitats includes Peach and Houston Counties (Reference 9).

Pursuant to the Georgia Wildlife Preservation Act of 1973, Chamaecyparis thyoides (Linnaeus) Atlantic White Cedar, Nestronia umbellula (Rafinesque) Indian Olive, Sarracenia rubra (Walter) Sweet Pitcherplant and Trillium reliquum (Freeman) Relict Toadshade are designated as state protected species (classified threatened/endangered plants) whose range of habitat include Peach, Houston, Taylor, Talbot, Marion, Crawford, Muscogee, Macon and Schley Counties (Reference 10).

The above protected flora and fauna were not designated as terrestrial sensitive environments for the soil or air pathways due to the fact that none of the protected species were observed on-site or off-site during the reconnaissance.

## 5.3 Surface Water Sample Locations

No surface water samples were taken to identify a release to Bay Creek and Big

Indian Creek. Probable point of entry (PPE) were chosen for Bay Creek and Big Indian Creek based on the surface runoff, topography of the area and the storm water line discharge.

### 5.4 Surface Water Conclusions

A potential release of contaminants to surface water is not suspected because of the distance to the PPE. No drinking water intakes have been identified but sensitive environments (wetlands and fishery) have been identified. The surface water pathway is not of concern.

## 6. SOIL EXPOSURE AND AIR PATHWAYS

The primary pathway of concern at this site is the groundwater pathway. As a part of the groundwater investigation, soil samples were collected which were analyzed for volatile organic compounds. No constituents were detected above method detection limits. Trace amounts of PCE (less than 5 µg/kg) were detected in one soil boring at the 0-4 foot and 4-8 foot depth intervals. No constituents are suspected to be at surface. Most of the site is paved with concrete or asphalt and therefore constituents are not available to surface or air exposure routes.

## 7. SUMMARY AND CONCLUSIONS

This investigation was conducted to evaluate this facility's potential as a source of the tetrachloroethylene contamination found in the nearby Fort Valley Municipal Wells 1 and 2. This investigation was conducted pursuant to CERCLA pre-remedial Site Inspection guidelines to evaluate the threat posed by the site to surrounding populations and sensitive environments via associated exposure routes.

The pathway of concern for this investigation is the groundwater pathway. Subsurface soil samples were collected at the site to determine if a release of tetrachloroethylene had occurred at the site, and if such a release has migrated to groundwater below the site.

A total of four subsurface soil samples were collected at the site. Collected samples were analyzed for volatile organic compounds (VOCs). Tetrachloroethylene was not detected above quantitation limits in any of the four subsurface soil samples collected at the site.

No evidence was found that indicates that the Peach MAC is a contributor to the PCE contamination in the Fort Valley Municipal Wells 1 and 2. It is recommended that no further CERCLA action be pursued at this time.

## REFERENCES


1. U.S.G.S. Topographic Map, 7.5 minute quadrangle, Fort Valley West, GA 1973.

2. Georgia Wellhead Protection Plan for City of Fort Valley, Peach County, Permit # 2250001, Expiration Date: July 27, 2001.

3. Fort Valley Phase I Investigation Plan; Task 1: Monitoring Well Installation and Sampling, Georgia Geologic Survey, September 12, 1997 Memorandum to William H. McLemore, State Geologist.

4. Little, Robert, City of Fort Valley City Hall, Phone Call (912) 825-8261, 15 December 1997.

5. McFarlene, Roger, U.S. Geological Survey, Phone Call (770) 903-9100, 11 December 1997.

6. U.S. Department of Housing and Urban Development, Flood Hazard Rate Map of Peach County, Georgia, 25 June 1976.

7. Schleger, Steve, Georgia Department of Natural Resources, Wildlife Resources Division, Fort Valley, Phone Call (912) 825-6151, 12 December 1997.

8. U.S. Department of the Interior, Fish and Wildlife Service, National Inventory Maps of Georgia, Fort Valley West 1995; Fort Valley East 1995; Marshallville 1988; Perry West 1988; and Perry East 1988; scale: 1:24,000.

9. Odom, Ron R., Georgia's Protected Wildlife, Georgia Department of Natural Resources, Game and Fish Division, Endangered Wildlife Program, 15 September 1977.

10. Patrick, Thomas S., Protected Plants of Georgia, Georgia Department of Natural Resources, Wildlife Resources Division, Georgia Natural Heritage Program, 1995.

# SITE INSPECTION WORKSHEETS

| CERCLIS IDENTIFICATION NUMBER |
|---|
| GAD 984 319 012 |

| SITE LOCATION | | | |
|---|---|---|---|
| SITE NAME: LEGAL, COMMON, OR DESCRIPTIVE NAME OF SITE<br>Peach Maximum Auto Care - (Peach MAC) | | | |
| STREET ADDRESS, ROUTE, OR SPECIFIC LOCATION IDENTIFIER<br>200 S. Camellia Boulevard | | | |
| CITY<br>Fort Valley | STATE<br>GA | ZIP CODE<br>31030 | TELEPHONE<br>912-825-8628 |

| OWNER/OPERATOR IDENTIFICATION | | | | | |
|---|---|---|---|---|---|
| OWNER<br>Mr. Timothy A. McCord | | | OPERATOR<br>Mr. Jerry Lee | | |
| OWNER ADDRESS<br>Same | | | OPERATOR ADDRESS<br>Same | | |
| CITY | | | CITY | | |
| STATE | ZIP CODE | TELEPHONE | STATE | ZIP CODE | TELEPHONE |

| SITE EVALUATION | | |
|---|---|---|
| AGENCY/ORGANIZATION<br>Georgia Environmental Protection Division | | |
| INVESTIGATOR<br>Kenneth Grall | | |
| CONTACT<br>Deadre Embrey | | |
| ADDRESS<br>205 Butler St. SE, Floyd Tower East, Suite 1162 | | |
| CITY<br>Atlanta | STATE<br>Georgia | ZIP CODE<br>30334 |
| TELEPHONE<br>404-656-2833 | | |

# GENERAL INFORMATION

**Site description and Operational History:** Provide a brief description of the site and its operational history. State the site name, owner, operator, type of facility and operations, size of property, active or inactive status, and years of waste generation. Summarize waste treatment, storage, or disposal activities that have or may have occurred at the site; note whether these activities are documented or alleged. Identify all source types and prior spills, floods, or fires. Summarize highlights of the PA and other investigations. Cite references.

**Location**

The Peach MAC site is located in Fort Valley, Peach County, Georgia at the intersection of South Camellia Boulevard and Central Avenue. The geographical coordinates are 32° 33' 8.5" North Latitude; 83° 53' 15.0" West Longitude, as shown on the United States Geological Survey (U.S.G.S.) Fort Valley West Quadrangle Topographic Map for Georgia.

**Site Description, Operational History and Waste Characteristics**

On December 29, 1992 Peach MAC notified as a small quantity generator of hazardous waste. The notification indicated the facility generates D001 (ignitable) and D008 (lead) wastes. During an October 31, 1995 compliance evaluation inspection it was noted the facility was generating D001 (ignitable) and D039 (PCE) hazardous wastes. During a March 26, 1998 multimedia inspection it was noted Peach MAC has generated D001 (ignitable), D006 (cadmium), D008 (lead), D018 (benzene), D027 (1,4-dichlorobenzene), D039 (tetrachloroethylene), and D040 (trichloroethylene).

According to the manager the current automobile repair business has occupied the building for the last 16 years. Solvents are used at Safety Kleen parts cleaning stations. The solvent supplied by Safety Kleen is 85% mineral spirits and contains less than 0.5% tetrachloroethylene. The building is approximately 35 years old and prior to being occupied by Peach MAC the facility was a tire store and automobile repair facility.

PCE has been found above detection limits in Fort Valley Municipal Water Supply Wells 1 and 2. The site is within the outer-management zone of the wellhead protection areas for both Municipal Wells 1 and 2.

**Source Description:** Include description of containment per pathway for ground water (see HRS Table 3-2), surface water (see HRS Table 4-2), and air (see HRS Tables 6-3 and 6-9).

NO SOURCE IDENTIFIED

**Hazardous Waste Quantity (HWQ) Calculation:** SI Tables 1 and 2 (See HRS Tables 2-5, 2-6, and 5-2.

NO SOURCE IDENTIFIED, HWQ = 0

Attach additional pages, if necessary

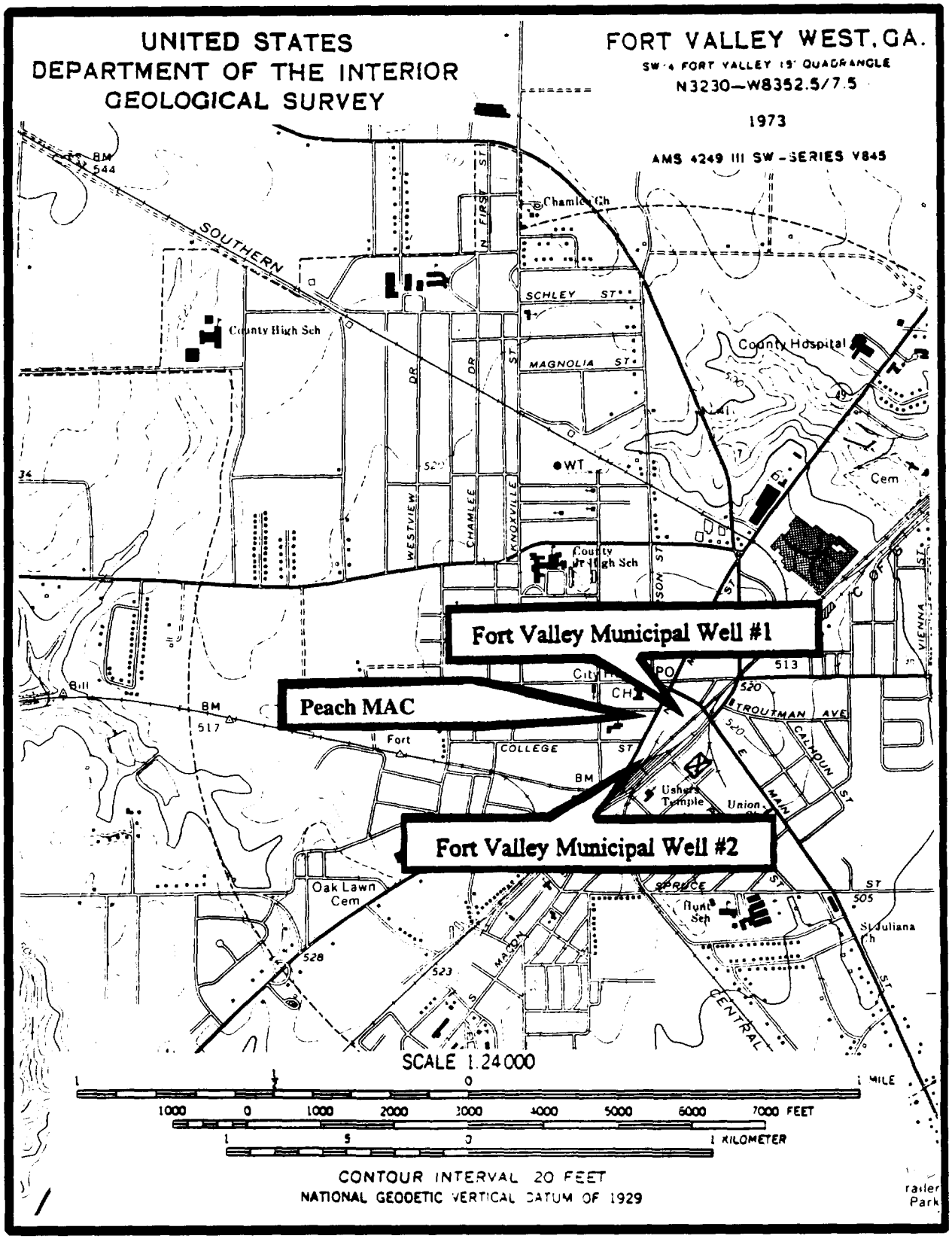
HWQ= 0

| SITE SCORE CALCULATION | S | $S^2$ |
|---|---|---|
| GROUND WATER PATHWAY SCORE ($S_{GW}$) | | |
| SURFACE WATER PATHWAY SCORE ($S_{SW}$) | | |
| SOIL EXPOSURE ($S_S$) | | |
| AIR PATHWAY SCORE ($S_A$) | | |
| SITE SCORE $\sqrt{\frac{S_{GW}^2+S_{SW}^2+S_S^2+S_A^2}{4}}$ = | 0.0 | |

**COMMENTS**

NO SOURCE WAS IDENTIFIED AT THIS SITE (HWQ=0). THEREFORE, THE SITE SCORE IS ZERO.

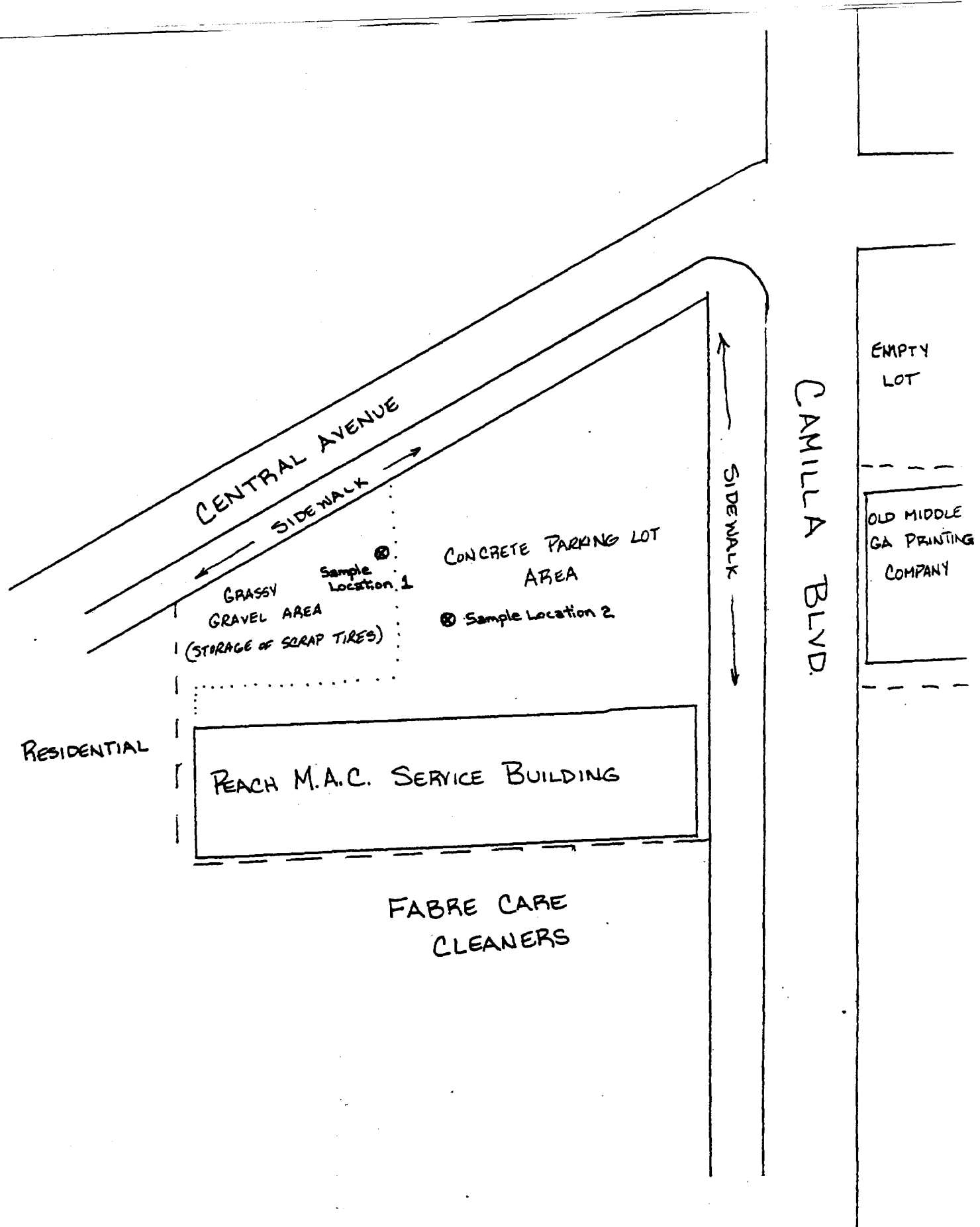
**Figure. Location of Peach MAC in relation to Fort Valley Municipal Wells #1 and #2.**



# UNSCANNABLE

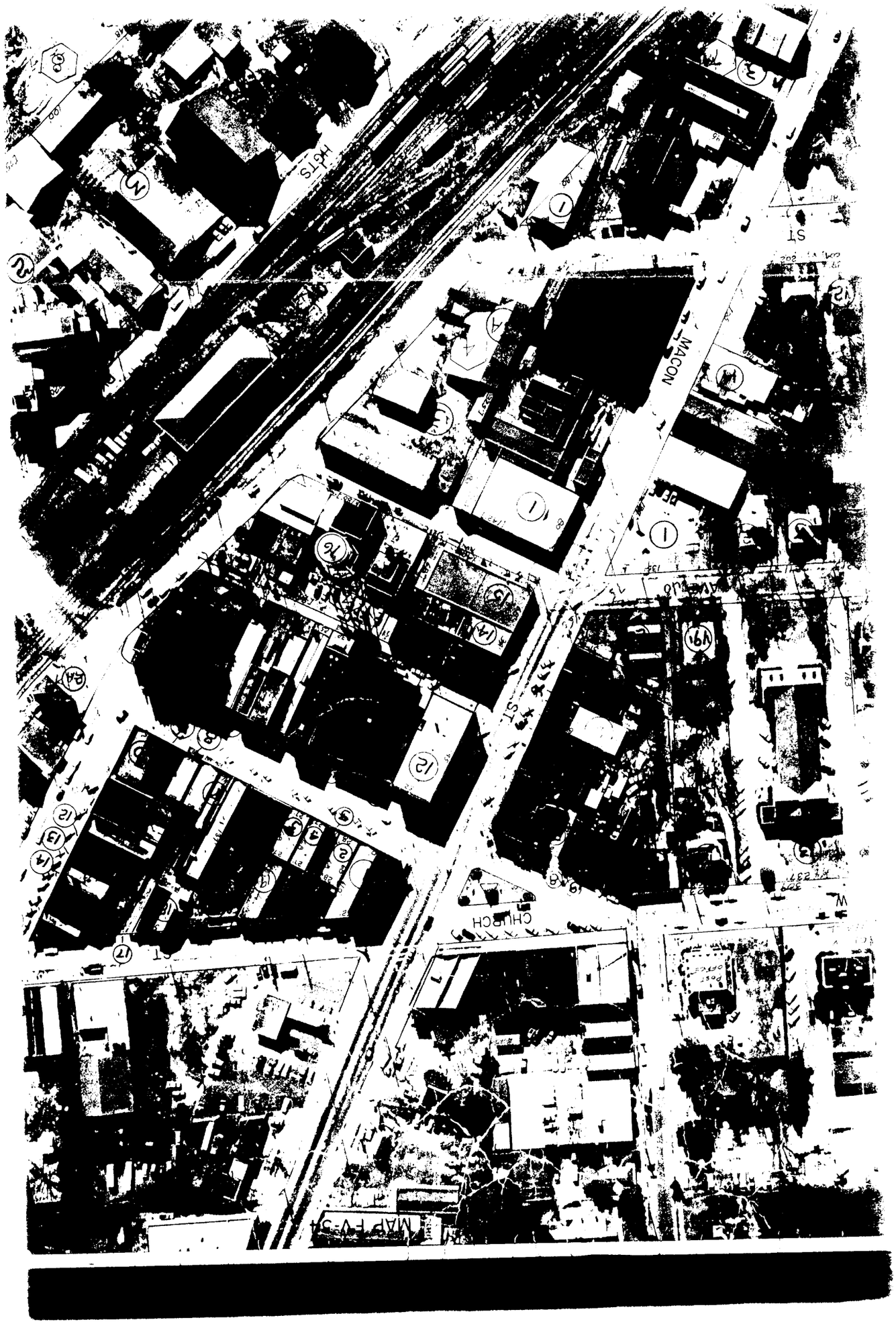
# MEDIA

# (PHOTOGRAPHS)




PEACH MAXIMUM AUTO CARE

FT. VALLEY, GA




1961

# OVERSIZED

# DOCUMENT

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 10-31-93. GSA No. 2245-EPA-01

Please refer to the *Instructions for Filing Notification* before completing this form. The information requested here is required by law (*Section 3010 of the Resource Conservation and Recovery Act*).

EPA

# Notification of Regulated Waste Activity

United States Environmental Protection Agency

Date Received (For Official Use Only)

JAN 06 1993

Hazardous Waste Enforcement Div.

**I. Installation's EPA ID Number** *(Mark 'X' in the appropriate box)*

☑ A. First Notification ☐ B. Subsequent Notification (complete item C)

C. Installation's EPA ID Number: GAD984319012

**II. Name of Installation** *(Include company and specific site name)*

Peach Maxi Auto Care

**III. Location of Installation** *(Physical address not P.O. Box or Route Number)*

Street: 200 S Camellia Blvd

Street (continued):

City or Town: Ft Valley | State: GA | ZIP Code: 31030-

County Code: | County Name: Peach

**IV. Installation Mailing Address** *(See Instructions)*

Street or P.O. Box: Same

City or Town: | State: | ZIP Code: -

**V. Installation Contact** *(Person to be contacted regarding waste activities at site)*

Name *(last)*: Lee | *(first)*: Jerry

Job Title: MGR | Phone Number *(area code and number)*: 912-825-8628

**VI. Installation Contact Address** *(See Instructions)*

A. Contact Address: Location ☐ Mailing ☐

B. Street or P.O. Box: Same

City or Town: | State: | ZIP Code: -

**VII. Ownership** *(See Instructions)*

A. Name of Installation's Legal Owner: Tim McCord

Street, P.O. Box, or Route Number: Same

City or Town: | State: | ZIP Code:

Phone Number *(area code and number)*: 912-825-8628

B. Land Type: P

C. Owner Type: P

D. Change of Owner Indicator: Yes ☐ No ☐

(Date Changed) Month | Day | Year

HAZARDOUS WASTE MGMT. BR. 5 1993 COMPLIANCE PROGRAM

EPA Form 8700-12 (01-90) Previous edition is obsolete.

Continue on reverse

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0039; EPA No. 3246; EPA-07

| ID - For Official Use Only |
|---|
| |

## VIII. Type of Regulated Waste Activity *(Mark 'X' in the appropriate boxes. Refer to instructions.)*

### A. Hazardous Waste Activity

1. Generator (See Instructions)
   - [ ] a. Greater than 1000kg/mo (2,200 lbs.)
   - [X] b. 100 to 1000 kg/mo (220 - 2,200 lbs.)
   - [ ] c. Less than 100 kg/mo (220 lbs.)
2. Transporter (Indicate Mode in boxes 1-5 below)
   - [ ] a. For own waste only
   - [ ] b. For commercial purposes

   Mode of Transportation
   - [ ] 1. Air
   - [ ] 2. Rail
   - [ ] 3. Highway
   - [ ] 4. Water
   - [ ] 5. Other - specify
3. [ ] Treater, Storer, Disposer (at installation) Note: A permit is required for this activity; see instructions.
4. Hazardous Waste Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketers
   - [ ] c. Burner - indicate device(s) - Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
5. [ ] Underground Injection Control

### B. Used Oil Fuel Activities

1. Off-Specification Used Oil Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketer
   - [ ] c. Burner - indicate device(s) - Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
2. [ ] Specification Used Oil Fuel Marketer (or On-site Burner) Who First Claims the Oil Meets the Specification

## IX. Description of Regulated Wastes *(Use additional sheets if necessary)*

**A. Characteristics of Nonlisted Hazardous Wastes.** Mark 'X' in the boxes corresponding to the characteristics of nonlisted hazardous wastes your installation handles *(See 40 CFR Parts 261.20 - 261.24)*

| 1. Ignitable (D001) | 2. Corrosive (D002) | 3. Reactive (D003) | 4. EP Toxic (D000) | (List specific EPA hazardous waste number(s) for the EP Toxic contaminant(s)) |
|---|---|---|---|---|
| X | | | | D008 |

**B. Listed Hazardous Wastes.** (See 40 CFR 261.31 - 33. See instructions if you need to list more than 12 waste codes.)

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| | | | | | |
| **7** | **8** | **9** | **10** | **11** | **12** |
| | | | | | |

**C. Other Wastes.** (State or other wastes requiring an I.D. number. See instructions.)

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| | | | | | |

## X. Certification

***I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.***

| Signature | Name and Official Title *(type or print)* | Date Signed |
|---|---|---|
| Jerry Lee | JERRY LEE Mgr | 12/29/92 |

## XI. Comments

***Note: Mail completed form to the appropriate EPA Regional or State Office. (See Section III of the booklet for addresses.)***

Georgia Department of Natural Resources

205 Butler Street, S.E., East Floyd Tower, Atlanta, Georgia 30334

Joe D. Tanner, Commissioner
Harold F. Behrens, Director
Environmental Protection Division

02/04/93

JERRY LEE MGR
PEACH MAXI AUTO CARE
200 S CAMELLIA BLVD
FT VALLEY , GA 31030

Re: EPA ID NUMBER GAD984319012
200 S CAMELLIA BLVD
FT VALLEY ,GA 31030

Dear JERRY LEE :

We have recently received your notification of regulated waste activity (EPA Form 8700-12).

The above referenced EPA ID number has been assigned to the facility at the address given. This number is site specific and will be used by the Georgia Environmental Protection Division and the US EPA for identification purposes. This number is not a permit. It used for data management and information tracking purposes.

ur cooperation in protecting Georgia's environment is appreciated.

Sincerely,

Paul Kocsis
Hazardous Waste Management Branch

Georgia Department of Natural Resources
205 Butler Street, SE, Suite 1066, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Environmental Protection Division
Harold F. Reheis, Director
404/657-8831

April 16, 1998

Mrs. Jan McCord
Owner
Peach Maxi Auto Care, Inc.
200 South Camelia Boulevard
Fort Valley, Georgia 31030

SUBJECT: GENERATOR REQUIREMENTS
Peach Maxi Auto Care, Inc.
Fort Valley, Peach County
EPA Identification Number - GAD984319012

Dear Mrs. McCord:

On March 26, 1998, a multimedia inspection was conducted at Peach Maxi Auto Care, located at 200 South Camellia Boulevard, Fort Valley, Georgia. During the inspection, I was accompanied by representatives of the Environmental Protection Agency (EPA) Region IV including Edmond Burks-Waste Management Division, Lisa Uhl-Water Division, and Lee Thomas-Water Division. A generator compliance and evaluation inspection was conducted to determine the facility's compliance status with applicable requirements of Georgia's Rules for Hazardous Waste Management, Chapter 391-3-11. On the date of the inspection, no violations were observed.

A copy of the checklist used during the inspection is enclosed. If any questions should arise, please contact me at (404) 657-8831. We appreciate your concern for protecting Georgia's environment.

Sincerely,

Betty J. Burns

Betty J. Burns
Environmental Specialist
Hazardous Waste Compliance Unit

BJB:bb
c: Renée Hudson Goodley
Freddie L. Dunn, Jr.
File: Peach Maxi Auto Care, Fort Valley
r:\BettyPEACMX98.CSL

FILE COPY

Georgia Department of Natural Resources
205 Butler Street, S.E., Suite 1066, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Harold F. Reneis, Director
Environmental Protection Division

# GENERATOR INSPECTION REPORT

## SECTION I: FACILITY INFORMATION

Facility Name: PEACH MAXI AUTO CARE

EPA Identification Number: GAD984315012 SIC Code: 7532

Location Address: 200 SOUTH CAMELLIA BOULEVARD

City: FORT VALLEY County: PEACH Zip Code: 31030

Mailing Address: 200 SOUTH CAMELLIA BOULEVARD

City: FORT VALLEY State: GEORGIA Zip Code: 31030

LQG — SQG — Trans — TSD — Other (specify) CESQG

Additional Checklists Required: Tank — Transporter — Used Oil Mgt. —

Estimated Quantity of Hazardous Waste Generated: (lbs/gallons monthly) 150-PREMIUM SOLV D001/D039 Carbureter and parts washer waste

Basis for Estimate FACILITY FILE/SITE INSPECTION

Officials Contacted:

Name JAN McCORD Title OWNER Telephone # 912/825/8628

Name _____ Title _____ Telephone # _____

Name _____ Title _____ Telephone # _____

## SECTION II: SUMMARY OF FINDINGS

NO VIOLATIONS WERE OBSERVED.

THIS SITE INVESTIGATION WAS CONDUCTED AS A MULTIMEDIA INSPECTION INVOLVING STAFF FROM EPA REGION IV (EDMOND BUCKS - EPA WASTE MGT. DIV.) AND LISA UHL & LEE THOMAS - EPA DRINKING WATER DIV.)

Samples: Yes ____ No ✓ Photographs: Yes ____ No ✓

Inspected by: BETTY BURNS Inspection Date: 3/26/98 Submittal Date 4/8/98

Reviewed by: Freddie L. Dunn, Jr. Review Date: 4/8/98

Attachments: NONE

FILE: PEACH MAXI AUTO CARE, FORT VALLEY

R:\LISTCHECK.LST(Rev.1/18/95)

## SECTION III: PRE-INSPECTION REVIEW

REGULATED WASTE ACTIVITY NOTIFICATION FORM ON FILE: ☑ YES ☐ NO

MOST RECENT DATE OF NOTIFICATION FORM: 1-6-93

FACILITY NOTIFIED AS A:

| GENERATOR | | TRANSPORTER |
|---|---|---|
| ☐ | LQG (≥ 1,000 KG/MO) | ☐ TSD |
| ☑ | SQG (> 100 KG/MO OR < 1,000 KG/MO) | ☐ _____ |
| ☐ | CESQG (≤ 100 KG/MO) | ☐ _____ |

MOST RECENT EPA HAZARDOUS WASTE CODES DOCUMENTED BY FILES:

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| D001 | D008 | D006 | D018 |
| **5** | **6** | **7** | **8** |
| D027 | D039 | D040 | |
| **9** | **10** | **11** | **12** |
| | | | |

SOURCE OF ABOVE INFORMATION/DATE: INSPECTION / FACILITY FILE

BIENNIAL REPORT(S) ON FILE: ☐ YES ☑ NO ☐ N/A REQUIRED YEAR(S): N/A

EXCEPTION REPORT(S) ON FILE: ☐ YES ☑ NO ☑ N/A DATE(S): N/A

HAZARDOUS WASTE REDUCTION PLAN(S) ON FILE: ☐ YES ☑ NO ☑ N/A

LAST INSPECTION DATE: N/A

a) VIOLATIONS NOTED: N/A

b) DATE OF LAST ENFORCEMENT ACTION: N/A

Note: If this inspection includes sampling, a Site Safety Plan must be approved prior to the inspection and attached to this report.

(N/A - Not applicable)

## SECTION IV: FIELD OBSERVATION DATA NOT APPLICABLE - NO SATELLITE ACCUMULATING IS DONE.

### A. WASTE GENERATION

| WASTE GENERATION | | SATELLITE ACCUMULATION | | | |
|---|---|---|---|---|---|
| PROCESS GENERATING HAZARDOUS WASTE | HOW THE FACILITY CLASSIFIED THE WASTE (waste code) | IS THERE SATELLITE ACCUMULATION? §262.34(c)(1) (Est.Volume in Gallons) | LABELING OF CONTAINER(S) §262.34(c)(1)(ii) | CONTAINER(S) CONDITION/ COMPATIBILITY §265.171 & §265.172 | CONTAINER(S) CLOSED §265.173 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Fluorescent Lamps, Mercury Vapor Lamps, Compact Fluorescent Lamps?** NO

**COMMENTS:** *(Attach description and schematic of facility's hazardous waste processes at end of checklist)* THIS FACILITY CONDUCTS automotive repair jobs. The site operates one parts washer and one brake cleaner from which hazardous waste D001/D039 is generated. The parts washer has a capacity of 16 gallons and the brake cleaner has a capacity of 4 gallons.

## SECTION IV CONTINUED

### B. HAZARDOUS WASTE STORAGE AREA NOT APPLICABLE - NON STORED

| WASTESTREAM (waste codes) | NUMBER OF CONTAINER(S) (Specify Volume if not 55 Gallon) | CONTAINER(S) MARKED HAZARDOUS WASTE §262.34(a)(3) | CONTAINER(S) MARKED WITH ACCUMULATION DATE §262.34(a)(2) | CONTAINER(S) CONDITION/ COMPATIBILITY §265.171 & §265.172 | CONTAINER(S) CLOSED §265.173 | ADEQUATE AISLE SPACE §265.35 |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
|---|---|---|---|---|---|---|
| IGNITABLE OR REACTIVE WASTE STORED >50 FEET FROM PROPERTY LINE? (§265.176) | ✓ | YES | | NO | | N/A |
| ARE INCOMPATIBLE WASTE SEPARATED BY DIKE, BERM, WALL OR OTHER DEVICE? (§265.177) | | YES | ✓ | NO | ✓ | N/A |

**COMMENTS:**

## SECTION IV CONTINUED

| | | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|---|
| **C.** | **TANK STORAGE/TREATMENT** | | | | |
| 1. | Does the facility use tanks to store or treat hazardous waste? If yes, see Tank Systems Checklist for Generators. | | ✓ | ✓ | |
| **D.** | **EMERGENCY EQUIPMENT** | | | | |
| 1. | Is facility operated and maintained to minimize possibility of fire, explosion, or release of hazardous waste to the environment? (§265.31) | ✓ | | | |
| 2. | Does the facility have the following equipment to deal with hazards posed by waste handled: (§265.32) | | | | |
| a. | Alarm system? (internal communication) | ✓ | | | |
| b. | Telephone or 2 way radio? (external communication) | ✓ | | | |
| c. | Fire extinguisher? | ✓ | | | |
| d. | Water? (If applicable) | ✓ | | | |
| e. | Are facility communication system, spill control equipment, fire protection equipment and decontamination equipment tested and maintained to ensure proper operation? (§265.33) | ✓ | | | |
| f. | Do personnel have immediate access to communication device or alarm system? (§265.34) | ✓ | | | |

List type of device or if verbal communication used:

_____

## SECTION V: GENERAL RECORDS

| | YES | NO | N/A | VIOLATION | |
|---|---|---|---|---|---|
| 1. Has facility notified of correct hazardous waste activity? (§262.12) | ✓ | | | | REC |
| 2. Does the facility conduct the weekly inspections of containers storing hazardous waste (§262.34) (§265.174) | | ✓ | ✓ | | |
| 3. Are waste profiles, waste analysis, or supporting documentation of waste determination per §262.11 in the facility's records? (§262.11) (§262.40)(c) | ✓ | | | | |
| 4. Have biennial reports been submitted? (§262.41) | | ✓ | ✓ | | |
| 5. Are copies of the biennial reports in the facility's records? (§262.40) | | ✓ | ✓ | | |
| 6. Have arrangements with the local authorities been made to familiarize them with the facility, types of waste handled, and hazards posed? (§265.37) | ✓ | | | | |
| 7. Does generator package waste in accordance with 49 CFR Parts 173, 178, and 179 (DOT requirements)? (§262.30) | ✓ | | | | |
| a. Does generator follow DOT labeling requirements in accordance with 49 CFR 172? (§262.31) | ✓ | | | | |
| b. Does generator mark each package in accordance with 49 CFR 172? (§262.32(a)) | ✓ | | | | |
| c. Is each container of 110 gallons or less marked with the following label? (§262.32(b)) | ✓ | | | | |
| **Hazardous Waste-Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.** **Generator Name and Address** _____ **Manifest Document Number** _____ | | | | | |
| d. Does generator have placards to offer to transporter? (§262.33) | ✓ | | | | |
| 8. Have fees been paid? | | ✓ | ✓ | | CEC - Not Require |
| a. Have the fee records (LQG) and fee report (LQG,SQG) been signed by a responsible corporate official? (391-3-19-.03(5)) | | ✓ | ✓ | | |

## SECTION V CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| b. Have the fee records (LQG) and the fee report (LQG,SQG), along with supporting documentation, been maintained on-site for a period of at least three years from the end of the calendar year for which they were completed (enacted July 1992)? (391-3-19-.03(5)) | | ✓ | ✓ | |
| c. Does the fee record (LQG) contain the following: (391-3-19-.03(5)) | | | | |
| 1. Manifest number for each shipment? | | ✓ | ✓ | |
| 2. Date of each shipment? | | ✓ | ✓ | |
| 3. Name and EPA I.D. Number of the final receiving facility for each shipment? | | ✓ | ✓ | |
| 4. By EPA hazardous waste number and method of management at the final receiving facility, the tons of hazardous waste for each shipment and the total tons of hazardous waste for the calendar year? | | ✓ | ✓ | |
| d. Have any discrepancies been noted between the fee records, fee reports, and the manifests for the subject period? | | ✓ | ✓ | |

**COMMENTS:**

# SECTION VI: CONTINGENCY PLAN

## A. LARGE QUANTITY GENERATOR

| | | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|---|
| 1. | Does the facility have a written Contingency Plan (§265.51) or a written Spill Prevention, Control, and Countermeasures Plan (SPCC)? (§265.52(b)) | | ✓ | ✓ | |
| 2. | Does the Contingency Plan/SPCC Plan include: | | | | |
| | a. Facility personnel action responses? (§265.52(a)) | | ✓ | ✓ | |
| | b. Description of agreement with the local authorities? (§265.52(c)) | | ✓ | ✓ | |
| | c. List of names, addresses, and phone numbers of emergency coordinators. Designates primary emergency coordinator, and list other coordinators in order of assumption of responsibility? (§265.52(d)) | | ✓ | ✓ | |
| | d. List of emergency equipment at the facility, including location, physical description and capabilities? (§265.52(e)) | | ✓ | ✓ | |
| | e. An evacuation plan for facility personnel? (§265.52(f)) | | ✓ | ✓ | |
| 3. | Have copies of the Contingency Plan/SPCC Plan been submitted to police, fire department, hospital, local emergency response teams? (§265.53) | | ✓ | ✓ | |
| 4. | Is the Contingency Plan/SPCC Plan amended when necessary? (§265.54) | | ✓ | ✓ | |
| 5. | Is at least one emergency coordinator on facility premises or on call? (§265.55) | | ✓ | ✓ | |
| 6. | Does the emergency coordinator respond immediately to emergencies, keep a record of these responses, and the report made to Federal, State, and local authorities, if required? (§265.56) | | ✓ | ✓ | |

## SECTION VI CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| **B. SMALL QUANTITY GENERATOR** | | | | |
| 1. Is the following information posted next to the telephone: (§262.34(d)(5)) | | | | |
| a. Name and telephone number of emergency coordinator? | ✓ | | | |
| b. Location of fire extinguishers, spill control material and, if present, fire alarm? | ✓ | | | |
| c. Telephone of the fire department if no direct alarm exists? | ✓ | | | |
| 2. Is at least one emergency coordinator on facility premises or on call? (§262.34(d)(5)(i)) | ✓ | | | |
| 3. Does emergency coordinator respond immediately to emergencies as expressed by §262.34(d)5(iv)? | ✓ | | | |

**COMMENTS:**

## SECTION VII: PERSONNEL TRAINING

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| **A. LARGE QUANTITY GENERATOR** | | | | |
| 1. Does facility have a personnel training program for hazardous waste management, consisting of classroom instruction or on the job training? (§265.16(a)(1)) (Note in Comment Session) | | ✓ | ✓ | |
| a. Is training directed by a person trained in hazardous waste management procedures? (§265.16(a)(2 and 3)) | | ✓ | ✓ | |

## SECTION VII CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| b. Do personnel complete training within 6 months of employment or job assignments? (§265.16(b)) | | ✓ | ✓ | |
| c. Do personnel take part in annual review of hazardous waste training? (§265.16(c)) | | ✓ | ✓ | |
| d. Are the following documents maintained per §265.16(d): | | | | |
| 1. Job title and name of employee? (§265.16(d)(1)) | | ✓ | ✓ | |
| 2. Job description? (§265.16(d)(2)) | | ✓ | ✓ | |
| 3. Amount and type of initial and continuing training to be given to each person filling a position? (§265.16(d)(3)) | | ✓ | ✓ | |
| 2. Are records that document training as job experience given to and completed by personnel? (§265.16(d)(4)) | | ✓ | ✓ | |
| 3. Are records kept until closure of facility or 3 years past employment of individual personnel? (§265.16(e)) | | ✓ | ✓ | |

### B. SMALL QUANTITY GENERATOR

| | | | | |
|---|---|---|---|---|
| 1. Are employees thoroughly familiar with proper waste handling and emergency procedures as relevant to their responsibilities during normal facility operations and emergencies? (§262.34(d)) | ✓ | | | |

**COMMENTS:**

## SECTION VIII: MANIFEST/LAND DISPOSAL RESTRICTION

| | | | | |
|---|---|---|---|---|
| 1. Are manifests kept in the facility's records for three years? (§262.40) | ✓ | | | |
| 2. Did generator retain one copy of manifest signed by the generator and transporter for three years or until the facility received a signed copy from the designated permitted facility which received the waste? (§262.23(a)(3)) | ✓ | | | |

## SECTION VIII CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| 3. Are manifests completed to include: (Part 262, Subpart B) | | | | |
| a. Manifest Document Number? | ✓ | | | |
| b. Generator's name, mailing address, telephone number? | ✓ | | | |
| c. Generator s EPA ID Number? | ✓ | | | |
| d. Transporter's name and EPA ID Number? | ✓ | | | |
| e. TSD's facility name, address, and EPA ID Number? | ✓ | | | |
| f. Waste information required by DOT: proper shipping name, quantity of waste, and type of container? | ✓ | | | |
| 4. Did generator sign and date all manifests? (§262.23) | ✓ | | | |
| 5. Did generator obtain original carbon copy with handwritten signature and date of acceptance from initial transporter and the receiving TSD? (§262.23) | ✓ | | | |
| 6. Did the generator file any exception reports? (§262.42) | | ✓ | ✓ | |
| 7. Are exception reports kept for three years? (§262.40) | | ✓ | ✓ | |
| 8. Has the generator determined that the facility is managing (§268.7): | | | | |
| a. A land disposal restricted waste? | ✓ | | | |
| b. A land disposal restricted waste that can be land disposed without any further treatment? | | ✓ | ✓ | |
| c. A waste that is subject to an exemption from the land disposal restriction prohibition (i.e.- A case-by-case exemption)? | | ✓ | ✓ | |
| 9. Does the land disposal restriction notification/ certification include: (§268.7) | | | | |
| a. EPA Hazardous Waste Numbers? (i.e. characteristics, listed waste) (§268.9)* | ✓ | | | |
| b. Manifest number? | ✓ | | | |

## SECTION VIII CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| c. For F001-F005 and F039 waste codes, the specific treatment standards? | ✓ | | | |
| d. Specific treatment standards for all other restricted waste codes, or references to the treatment standards which specify the following information: | ✓ | | | |
| 1. Wastewater or non-wastewater (treatment group), | ✓ | | | |
| 2. Sub-category of the waste, within a waste code, | ✓ | | | |
| 3. The specific CFR section and paragraph, and | ✓ | | | |
| 4. The five-letter treatment code when the treatment standard is expressed as a technology. | ✓ | | | |
| e. Certification that the waste can be land disposed without any further treatment? | | ✓ | ✓ | |
| f. Certification that the waste is exempt from land disposed restriction requirements and includes date which this exemption applies? | | ✓ | ✓ | |

***If a hazardous waste determination consists of both Listed and Characteristic EPA waste codes, the applicable LDR waste code can exclude the Characteristic waste code if the specific hazardous constituent responsible for that Characteristic is already addressed by the treatment standard for the Listed waste code (i.e., an ignitable, spent acetone solvent characterized as F003, D001 would have a LDR waste code of F003). Otherwise, all EPA waste codes subject to LDR must be cited.**

| | | | | |
|---|---|---|---|---|
| 10. Has facility notified designated TSD facility per requirements? (§268.7(a)(1)). | ✓ | | | |
| 11. Does facility maintain copies of LDR determinations, notifications, waste analysis, etc. relating to requirements in records for five years? (§268.7(a)(5)(6)(7)) | ✓ | | | |
| 12. Are any lab pack waste(s) shipped off-site? (§268.7(a)(8)(9)) | | ✓ | ✓ | |
| 13. Does generator treat waste(s) in tanks or containers to comply with land disposal restriction requirements? (§268.7(a)(4)) | | ✓ | ✓ | |
| a. Does Waste Analysis Plan include detailed chemical and physical analysis and all information to treat the waste(s)? (§268.7(a)(4)(i)) | | ✓ | ✓ | |

## SECTION VIII CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| b. Has a copy of Waste Analysis Plan been submitted to Regional Administrator and Environmental Protection Division? (§268.7(a)(4)(ii)) | | ✓ | ✓ | |
| i. Has submittal been verified? (§268.7(a)(4)(ii)) | | ✓ | ✓ | |
| ii. Has facility notified designated TSD per requirements? (§268.7(a)(2)) and (§268.7(a)(4)(iii)) | | ✓ | ✓ | |
| c. Does the generator treat wastes which exhibit a characteristic to render the waste non-hazardous and ships this waste to a subtitle D facility? (§268.9(d)) | | ✓ | ✓ | |
| i. Are notices made to EPA and EPD? | | ✓ | ✓ | |
| ii. Are copies of the notices kept in the facility's records? | | ✓ | ✓ | |
| iii. Do the notices comply with the requirements in §268.9? | | ✓ | ✓ | |
| 14. Is this facility a small quantity generator whose waste is reclaimed under a contractual agreement (§262.20(e))? | ✓ | | | |
| a. Are the type(s) of waste and frequency of removal specified in the contract agreement? | ✓ | | | |
| b. Is the vehicle used to transport waste to recycling facility and to deliver regenerated material back to the generator owned and operated by the reclaimer of the waste? | ✓ | | | |
| c. Did generator maintain a copy of the reclamation agreement in the facility records for at least three years after termination or expiration of their agreement? | ✓ | | | |
| d. Did generator maintain a copy of the initial land disposal restriction notification in the facility's records for at least three years after the termination or the expiration of the contract? (§268.7)(a)(10) | ✓ | | | |

**COMMENTS:**

# SECTION IX: USED OIL MANAGEMENT

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| **A. USED OIL ACTIVITIES** | | | | |
| 1. Does this facility burn used oil fuel for energy recovery or market used oil fuel directly to such a burner? If yes, see Used Oil Management Checklist, (Section IX) | | ✓ | ✓ | |
| 2. Does the facility generate used oil? | ✓ | | | |
| **B. USED OIL STORAGE (279.22, 279.45, 279.54, 279.64)** | | | | |
| 1. Does the facility store used oil? | ✓ | | | |
| 2. Is the used oil stored in tanks, containers, or units subject to regulation under 40 CFR Parts 264 or 265? | ✓ | | | |
| 3. Are the containers and aboveground tanks in good condition with no leaks? | ✓ | | | |
| 4. Are containers, aboveground tanks, and fill pipes for underground storage tanks labeled or marked clearly with the words "Used Oil?" | ✓ | | | |
| 5. Have any releases of used oil to the environment occurred? (describe in comment section) | | ✓ | ✓ | |
| a. Did the facility stop the release? | | ✓ | ✓ | |
| b. Did the facility contain the released used oil? | | ✓ | ✓ | |
| c. Did the facility clean up and manage properly the released used oil and other materials? | | ✓ | ✓ | |
| d. Did the facility repair or replace any leaking storage containers or tanks to prevent future releases prior to returning them to service? | | ✓ | ✓ | |
| **C. HAZARDOUS WASTE MIXING (279.21)** | | | | |
| 1. Does the generator mix hazardous waste with the used oil? | | ✓ | ✓ | |
| a. Does the mixture exhibit any characteristics of hazardous waste? (If yes, regulated as hazardous waste under Part 262.) | | ✓ | ✓ | |

## SECTION IX CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| b. Does the used oil contain greater than 1,000 ppm total halogens? (If yes, presumed to be hazardous.) | | ✓ | ✓ | |

### D. ON-SITE BURNING IN SPACE HEATERS (279.23)

| | | | | |
|---|---|---|---|---|
| 1. Does the generator burn used oil in used oil-fired space heaters? | | ✓ | ✓ | |
| a. Does the generator burn only used oil generated at the facility or received from household do-it-yourself used oil generators? | | ✓ | ✓ | |
| b. Is the heater designed to have a maximum capacity of not more than 0.5 million Btu per hour? | | ✓ | ✓ | |

### E. OFF-SITE SHIPMENTS (279.24)

| | | | | |
|---|---|---|---|---|
| 1. Does the generator transport the facility's used oil or used oil from do-it-yourselfers to a used oil collection center? | | ✓ | ✓ | |
| a. Is the used oil transported in a vehicle owned by the facility or an employee? | | ✓ | ✓ | |
| b. Does the generator transport more than 55 gallons at any time? | | ✓ | ✓ | |
| c. Is the collection center registered, licensed, permitted, or recognized by a state/county/ municipal government to manage used oil? | | ✓ | ✓ | |
| 2. Does the generator transport the facility's used oil to an aggregation point? | | ✓ | ✓ | |
| a. Is the used oil transported in a vehicle owned/ operated by the facility or an employee? | | ✓ | ✓ | |
| b. Does the generator transport more than 55 gallons at any time? | | ✓ | ✓ | |
| c. Is the aggregation point owned and/or operated by the same generator? | | ✓ | ✓ | |

## SECTION IX CONTINUED

| | YES | NO | NA | VIOLATION |
|---|---|---|---|---|
| 3. Does the generator have a contractual agreement pursuant to which reclaimed oil is returned by the processor/re-refiner to the generator for use as a lubricant, cutting oil, or coolant? | | ✓ | ✓ | |
| a. Does the contract indicate the type of used oil and the frequency of shipments? | | ✓ | ✓ | |
| b. Does the contract indicate that the vehicle used to transport the used oil to the processing/re-refining facility and to deliver recycled used oil back to the generator is owned and operated by the used oil processor/re-refiner? | | ✓ | ✓ | |
| c. Does the contract indicate that reclaimed oil will be returned to the generator? | | ✓ | ✓ | |
| 4. Does the generator ensure that the used oil is transported only by transporters who have obtained EPA identification numbers? | | | | |

## F. USED OIL FILTER EXCLUSION (261.4(b)(13))

| | | | | |
|---|---|---|---|---|
| 1. Does the generator manage used oil filters? | ✓ | | | |
| a. Are the filters non-terne plated? | ✓ | | | |
| b. Are the filters gravity hot-drained? | ✓ | | | |

COMMENTS: The used oil, drained filters, antifreeze, parts washer and brake cleaner wastes are managed by Safety-Kleen.

R:\LIST\CHECK.LST (Rev. 1/18/95)

# Georgia Department of Natural Resources

205 Butler Street, SE, Suite 1066, Atlanta, Georgia 30334

Lonice C. Barrett, Commissioner
Environmental Protection Division
Harold F. Reheis, Director
404/657-8831


November 6, 1995

Mr. Jerry Lee
Manager
Peach Maxi Auto Care, Inc.
200 South Camellia Boulevard
Fort Valley, Georgia 31030

SUBJECT: GENERATOR REQUIREMENTS
Peach Maxi Auto Care, Inc.
Fort Valley, Peach County
EPA ID Number GAD984319012

Dear Mr. Lee:

On October 31, 1995, I conducted a hazardous waste generator compliance and evaluation inspection of your facility located at 200 South Camellia Boulevard, Fort Valley, Georgia. This inspection was performed to determine your facility's compliance status with Georgia's Rules for Hazardous Waste Management ("Rules"), Section 391-3-11-.08 (Standards Applicable To Generators Of Hazardous Waste), and Section 391-3-11-.16 (Land Disposal Restrictions). It was determined that on this date no violations of the Rules were observed.

Please find enclosed a copy of the checklist that was used during the inspection. Should any questions arise, please contact me at 404/657-8831. Your concern for protecting Georgia's environment is greatly appreciated.

Sincerely,

Betty J. Burns

Betty J. Burns
Environmental Specialist
Hazardous Waste Compliance Unit

BB:ttd
c: Renée Hudson Goodley
Freddie L. Dunn, Jr.
File: Peach Maxi Auto Care, Fort Valley
R:\BETTY\Peach.CSL

Georgia Department of Natural Resources
205 Butler Street, S.E., Suite 1066, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Harold F. Reheis, Director
Environmental Protection Division

# GENERATOR INSPECTION REPORT

## SECTION I: FACILITY INFORMATION

Facility Name: Peach Maxi Auto Care

EPA Identification Number: GAD 984 314012 SIC Code: 7532

Location Address: 200 South Camellia Blvd.

City: Fort Valley County: Peach Zip Code: 31030

Mailing Address: Same

City: Same State: Ga. Zip Code: —

LQG — SQG — Trans — TSD — Other (specify) — CESQG

Additional Checklists Required: Tank — Transporter — Used Oil Mgt. —

Estimated Quantity of Hazardous Waste Generated: (lbs/gallons monthly) 140 lbs CESQG

Basis for Estimate inspection data Conditionally Exempt Small Quantity Generator

Officials Contacted:

Name Jerry Lee Title Manager Telephone # 912-825-8628

Name Title Telephone #

Name Title Telephone #

## SECTION II: SUMMARY OF FINDINGS

No violations of the rules were observed.

automotive repair

Samples: Yes ___ No ✓ Photographs: Yes ___ No ✓

Inspected by: Betty Burns Inspection Date: 10-31-95 Submittal Date 11-1-95

Reviewed by: Freddie L. Dennis Review Date: 11/06/95

Attachments: None

FILE: Peach Maxi Auto Care, Fort Valley

R:\LIST\CHECK.LST(Rev.1/18/95)

## SECTION III: PRE-INSPECTION REVIEW

REGULATED WASTE ACTIVITY NOTIFICATION FORM ON FILE: ☑ YES ☐ NO

MOST RECENT DATE OF NOTIFICATION FORM: 1/6/93

FACILITY NOTIFIED AS A:

| GENERATOR | | TRANSPORTER |
|---|---|---|
| ☐ | LQG (≤ 1,000 KG/MO) | ☐ TRANSPORTER |
| ☑ | SQG (> 100 KG/MO OR < 1,000 KG/MO) | ☐ TSD |
| ☐ | CESQG (≤ 100 KG/MO) | ☐ _____ |
| | | ☐ _____ |

MOST RECENT EPA HAZARDOUS WASTE CODES DOCUMENTED BY FILES:

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| D001 | D039 | | |
| **5** | **6** | **7** | **8** |
| | | | |
| **9** | **10** | **11** | **12** |
| | | | |

SOURCE OF ABOVE INFORMATION/DATE: Inspection Data

BIENNIAL REPORT(S) ON FILE: ☐ YES ☑ NO ☑ N/A REQUIRED YEAR(S): N/A

EXCEPTION REPORT(S) ON FILE: ☐ YES ☑ NO ☑ N/A DATE(S): N/A

HAZARDOUS WASTE REDUCTION PLAN(S) ON FILE: ☐ YES ☑ NO ☑ N/A

LAST INSPECTION DATE: NA

a) VIOLATIONS NOTED: NA

b) DATE OF LAST ENFORCEMENT ACTION: NA

Note: If this inspection includes sampling, a Site Safety Plan must be approved prior to the inspection and attached to this report.

(N/A - Not applicable)

## SECTION IV: FIELD OBSERVATION DATA

### A. WASTE GENERATION

N/A

| WASTE GENERATION | | SATELLITE ACCUMULATION | | | |
|---|---|---|---|---|---|
| PROCESS GENERATING HAZARDOUS WASTE | HOW THE FACILITY CLASSIFIED THE WASTE (waste code) | IS THERE SATELLITE ACCUMULATION? §262.34(c)(1) (Est.Volume in Gallons) | LABELING OF CONTAINER(S) §262.34(c)(1)(ii) | CONTAINER(S) CONDITION/ COMPATIBILITY §265.171 & §265.172 | CONTAINER(S) CLOSED §265.173 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**Fluorescent Lamps, Mercury Vapor Lamps, Compact Fluorescent Lamps?** No

**COMMENTS:** *(Attach description and schematic of facility's hazardous waste processes at end of checklist)*

Operates two parts washers (4 gals) (16 gals)

## SECTION IV CONTINUED

### B. HAZARDOUS WASTE STORAGE AREA

NA

| WASTESTREAM (waste codes) | NUMBER OF CONTAINER(S) (Specify Volume if not 55-Gallon) | CONTAINER(S) MARKED HAZARDOUS WASTE §262.34(a)(3) | CONTAINER(S) MARKED WITH ACCUMULATION DATE §262.34(a)(2) | CONTAINER(S) CONDITION/ COMPATIBILITY §265.171 & §265.172 | CONTAINER(S) CLOSED §265.173 | ADEQUATE AISLE SPACE §265.35 |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| IGNITABLE OR REACTIVE WASTE STORED >50 FEET FROM PROPERTY LINE? (§265.176) | ✓ | YES | | NO | | N/A |
| ARE INCOMPATIBLE WASTE SEPARATED BY DIKE, BERM, WALL OR OTHER DEVICE? (§265.177) | | YES | ✓ | NO | ✓ | N/A |

**COMMENTS:**

## SECTION IV CONTINUED

| | | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|---|
| **C.** | **TANK STORAGE/TREATMENT** | | | | |
| 1. | Does the facility use tanks to store or treat hazardous waste? If yes, see Tank Systems Checklist for Generators. | | ✓ | ✓ | |
| **D.** | **EMERGENCY EQUIPMENT** | | | | |
| 1. | Is facility operated and maintained to minimize possibility of fire, explosion, or release of hazardous waste to the environment? (§265.31) | ✓ | | | |
| 2. | Does the facility have the following equipment to deal with hazards posed by waste handled: (§265.32) | | | | |
| a. | Alarm system? (internal communication) | ✓ | | | |
| b. | Telephone or 2 way radio? (external communication) | ✓ | | | |
| c. | Fire extinguisher? | ✓ | | | |
| d. | Water? (If applicable) | ✓ | | | |
| e. | Are facility communication system, spill control equipment, fire protection equipment and decontamination equipment tested and maintained to ensure proper operation? (§265.33) | ✓ | | | |
| f. | Do personnel have immediate access to communication device or alarm system? (§265.34) | ✓ | | | |

List type of device or if verbal communication used:

_____

## SECTION V: GENERAL RECORDS

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| 1. Has facility notified of correct hazardous waste activity? (§262.12) | ✓ | | | |
| 2. Does the facility conduct the weekly inspections of containers storing hazardous waste (§262.34) (§265.174) | | ✓ | ✓ | |
| 3. Are waste profiles, waste analysis, or supporting documentation of waste determination per §262.11 in the facility's records? (§262.11) (§262.40)(c) | ✓ | | | MSDS - Mineral Spirits |
| 4. Have biennial reports been submitted? (§262.41) | | ✓ | ✓ | |
| 5. Are copies of the biennial reports in the facility's records? (§262.40) | | ✓ | ✓ | |
| 6. Have arrangements with the local authorities been made to familiarize them with the facility, types of waste handled, and hazards posed? (§265.37) | | ✓ | ✓ | |
| 7. Does generator package waste in accordance with 49 CFR Parts 173, 178, and 179 (DOT requirements)? (§262.30) | ✓ | | | |
| a. Does generator follow DOT labeling requirements in accordance with 49 CFR 172? (§262.31) | ✓ | | | |
| b. Does generator mark each package in accordance with 49 CFR 172? (§262.32(a)) | ✓ | | | |
| c. Is each container of 110 gallons or less marked with the following label? (§262.32(b)) | ✓ | | | |

**Hazardous Waste-Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.**

**Generator Name and Address** _____
**Manifest Document Number** _____

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| d. Does generator have placards to offer to transporter? (§262.33) | ✓ | | | |
| 8. Have fees been paid? | | ✓ | ✓ | |
| a. Have the fee records (LQG) and fee report (LQG,SQG) been signed by a responsible corporate official? (391-3-19-.03(5)) | | ✓ | ✓ | |

## SECTION V CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| b. Have the fee records (LQG) and the fee report (LQG,SQG), along with supporting documentation, been maintained on-site for a period of at least three years from the end of the calendar year for which they were completed (enacted July 1992)? (391-3-19-.03(5)) | | ✓ | ✓ | |
| c. Does the fee record (LQG) contain the following: (391-3-19-.03(5)) | | | | |
| 1. Manifest number for each shipment? | | ✓ | ✓ | |
| 2. Date of each shipment? | | ✓ | ✓ | |
| 3. Name and EPA I.D. Number of the final receiving facility for each shipment? | | ✓ | ✓ | |
| 4. By EPA hazardous waste number and method of management at the final receiving facility, the tons of hazardous waste for each shipment and the total tons of hazardous waste for the calendar year? | | ✓ | ✓ | |
| d. Have any discrepancies been noted between the fee records, fee reports, and the manifests for the subject period? | | ✓ | ✓ | |

**COMMENTS:**

## SECTION VI: CONTINGENCY PLAN

NA

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| **A. LARGE QUANTITY GENERATOR** | | | | |
| 1. Does the facility have a written Contingency Plan (§265.51) or a written Spill Prevention, Control, and Countermeasures Plan (SPCC)? (§265.52(b)) | ___ | ___ | ___ | ___ |
| 2. Does the Contingency Plan/SPCC Plan include: | | | | |
| a. Facility personnel action responses? (§265.52(a)) | ___ | ___ | ___ | ___ |
| b. Description of agreement with the local authorities? (§265.52(c)) | ___ | ___ | ___ | ___ |
| c. List of names, addresses, and phone numbers of emergency coordinators. Designates primary emergency coordinator, and list other coordinators in order of assumption of responsibility? (§265.52(d)) | ___ | ___ | ___ | ___ |
| d. List of emergency equipment at the facility, including location, physical description and capabilities? (§265.52(e)) | ___ | ___ | ___ | ___ |
| e. An evacuation plan for facility personnel? (§265.52(f)) | ___ | ___ | ___ | ___ |
| 3. Have copies of the Contingency Plan/SPCC Plan been submitted to police, fire department, hospital, local emergency response teams? (§265.53) | ___ | ___ | ___ | ___ |
| 4. Is the Contingency Plan/SPCC Plan amended when necessary? (§265.54) | ___ | ___ | ___ | ___ |
| 5. Is at least one emergency coordinator on facility premises or on call? (§265.55) | ___ | ___ | ___ | ___ |
| 6. Does the emergency coordinator respond immediately to emergencies, keep a record of these responses, and the report made to Federal, State, and local authorities, if required? (§265.56) | ___ | ___ | ___ | ___ |

## SECTION VI CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| **B. SMALL QUANTITY GENERATOR** | | | | |
| 1. Is the following information posted next to the telephone: (§262.34(d)(5)) | | | | |
| a. Name and telephone number of emergency coordinator? | ✓ | | | |
| b. Location of fire extinguishers, spill control material and, if present, fire alarm? | ✓ | | | |
| c. Telephone of the fire department if no direct alarm exists? | ✓ | | | |
| 2. Is at least one emergency coordinator on facility premises or on call? (§262.34(d)(5)(i)) | ✓ | | | |
| 3. Does emergency coordinator respond immediately to emergencies as expressed by §262.34(d)5(iv)? | ✓ | | | |

**COMMENTS:**

## SECTION VII: PERSONNEL TRAINING

NA

### A. LARGE QUANTITY GENERATOR

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| 1. Does facility have a personnel training program for hazardous waste management, consisting of classroom instruction or on the job training? (§265.16(a)(1)) (Note in Comment Session) | | | | |
| a. Is training directed by a person trained in hazardous waste management procedures? (§265.16(a)(2 and 3)) | | | | |

## SECTION VII CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| b. Do personnel complete training within 6 months of employment or job assignments? (§265.16(b)) | | | NA | |
| c. Do personnel take part in annual review of hazardous waste training? (§265.16(c)) | | | | |
| d. Are the following documents maintained per §265.16(d): | | | | |
| 1. Job title and name of employee? (§265.16(d)(1)) | | | | |
| 2. Job description? (§265.16(d)(2)) | | | | |
| 3. Amount and type of initial and continuing training to be given to each person filling a position? (§265.16(d)(3)) | | | | |
| 2. Are records that document training as job experience given to and completed by personnel? (§265.16(d)(4)) | | | | |
| 3. Are records kept until closure of facility or 3 years past employment of individual personnel? (§265.16(e)) | | | | |

## B. SMALL QUANTITY GENERATOR

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| 1. Are employees thoroughly familiar with proper waste handling and emergency procedures as relevant to their responsibilities during normal facility operations and emergencies? (§262.34(d)) | ✓ | | | |

**COMMENTS:**

## SECTION VIII: MANIFEST/LAND DISPOSAL RESTRICTION

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| 1. Are manifests kept in the facility's records for three years? (§262.40) | ✓ | | ✓ | |
| 2. Did generator retain one copy of manifest signed by the generator and transporter for three years or until the facility received a signed copy from the designated permitted facility which received the waste? (§262.23(a)(3)) | ✓ | | ✓ | |

## SECTION VIII CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| 3. Are manifests completed to include: (Part 262, Subpart B) | | | | |
| a. Manifest Document Number? | ✓ | | ✓ | |
| b. Generator's name, mailing address, telephone number? | ✓ | | | |
| c. Generator's EPA ID Number? | ✓ | | | |
| d. Transporter's name and EPA ID Number? | ✓ | | | |
| e. TSD's facility name, address, and EPA ID Number? | ✓ | | | |
| f. Waste information required by DOT: proper shipping name, quantity of waste, and type of container? | ✓ | | | |
| 4. Did generator sign and date all manifests? (§262.23) | ✓ | | | |
| 5. Did generator obtain original carbon copy with handwritten signature and date of acceptance from initial transporter and the receiving TSD? (§262.23) | ✓ | | | |
| 6. Did the generator file any exception reports? (§262.42) | | ✓ | ✓ | |
| 7. Are exception reports kept for three years? (§262.40) | | ✓ | ✓ | |
| 8. Has the generator determined that the facility is managing (§268.7): | | | | |
| a. A land disposal restricted waste? | ✓ | | ✓ | |
| b. A land disposal restricted waste that can be land disposed without any further treatment? | | ✓ | ✓ | |
| c. A waste that is subject to an exemption from the land disposal restriction prohibition (i.e.- A case-by-case exemption)? | | ✓ | ✓ | |
| 9. Does the land disposal restriction notification/ certification include: (§268.7) | | | | |
| a. EPA Hazardous Waste Numbers? (i.e. characteristics, listed waste) (§268.9)* | ✓ | | | |
| b. Manifest number? | ✓ | | | |

## SECTION VIII CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| c. For F001-F005 and F039 waste codes, the specific treatment standards? | | ✓ | ✓ | |
| d. Specific treatment standards for all other restricted waste codes, or references to the treatment standards which specify the following information: | ✓ | | | |
| 1. Wastewater or non-wastewater (treatment group), | ✓ | | | |
| 2. Sub-category of the waste, within a waste code, | ✓ | | | |
| 3. The specific CFR section and paragraph, and | ✓ | | | |
| 4. The five-letter treatment code when the treatment standard is expressed as a technology. | ✓ | | | |
| e. Certification that the waste can be land disposed without any further treatment? | | ✓ | ✓ | |
| f. Certification that the waste is exempt from land disposed restriction requirements and includes date which this exemption applies? | | ✓ | ✓ | |

***If a hazardous waste determination consists of both Listed and Characteristic EPA waste codes, the applicable LDR waste code can exclude the Characteristic waste code if the specific hazardous constituent responsible for that Characteristic is already addressed by the treatment standard for the Listed waste code (i.e., an ignitable, spent acetone solvent characterized as F003, D001 would have a LDR waste code of F003). Otherwise, all EPA waste codes subject to LDR must be cited.**

| | | | | |
|---|---|---|---|---|
| 10. Has facility notified designated TSD facility per requirements? (§268.7(a)(1)). | ✓ | | | |
| 11. Does facility maintain copies of LDR determinations, notifications, waste analysis, etc. relating to requirements in records for five years? (§268.7(a)(5)(6)(7)) | ✓ | | | |
| 12. Are any lab pack waste(s) shipped off-site? (§268.7(a)(8)(9)) | | ✓ | ✓ | |
| 13. Does generator treat waste(s) in tanks or containers to comply with land disposal restriction requirements? (§268.7(a)(4)) | | ✓ | ✓ | |
| a. Does Waste Analysis Plan include detailed chemical and physical analysis and all information to treat the waste(s)? (§268.7(a)(4)(i)) | | ✓ | ✓ | |

## SECTION VIII CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| b. Has a copy of Waste Analysis Plan been submitted to Regional Administrator and Environmental Protection Division? (§268.7(a)(4)(ii)) | | ✓ | ✓ | |
| i. Has submittal been verified? (§268.7(a)(4)(ii)) | | ✓ | ✓ | |
| ii. Has facility notified designated TSD per requirements? (§268.7(a)(2)) and (§268.7(a)(4)(iii)) | | ✓ | ✓ | |
| c. Does the generator treat wastes which exhibit a characteristic to render the waste non-hazardous and ships this waste to a subtitle D facility? (§268.9(d)) | | ✓ | ✓ | |
| i. Are notices made to EPA and EPD? | | ✓ | ✓ | |
| ii. Are copies of the notices kept in the facility's records? | | ✓ | ✓ | |
| iii. Do the notices comply with the requirements in §268.9? | | ✓ | ✓ | |
| 14. Is this facility a small quantity generator whose waste is reclaimed under a contractual agreement (§262.20(e))? | ✓ | | | |
| a. Are the type(s) of waste and frequency of removal specified in the contract agreement? | ✓ | | | |
| b. Is the vehicle used to transport waste to recycling facility and to deliver regenerated material back to the generator owned and operated by the reclaimer of the waste? | ✓ | | | |
| c. Did generator maintain a copy of the reclamation agreement in the facility records for at least three years after termination or expiration of their agreement? | ✓ | | | |
| d. Did generator maintain a copy of the initial land disposal restriction notification in the facility's records for at least three years after the termination or the expiration of the contract? (§268.7)(a)(10) | ✓ | | | |

**COMMENTS:**

# SECTION IX: USED OIL MANAGEMENT

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| **A. USED OIL ACTIVITIES** | | | | |
| 1. Does this facility burn used oil fuel for energy recovery or market used oil fuel directly to such a burner? If yes, see Used Oil Management Checklist, (Section IX) | | ✓ | ✓ | |
| 2. Does the facility generate used oil? | ✓ | | | |
| **B. USED OIL STORAGE (279.22, 279.45, 279.54, 279.64)** | | | | |
| 1. Does the facility store used oil? | ✓ | | | |
| 2. Is the used oil stored in tanks, containers, or units subject to regulation under 40 CFR Parts 264 or 265? | ✓ | | | |
| 3. Are the containers and aboveground tanks in good condition with no leaks? | ✓ | | | |
| 4. Are containers, aboveground tanks, and fill pipes for underground storage tanks labeled or marked clearly with the words "Used Oil?" | ✓ | | | |
| 5. Have any releases of used oil to the environment occurred? (describe in comment section) | | ✓ | ✓ | |
| a. Did the facility stop the release? | | ✓ | ✓ | |
| b. Did the facility contain the released used oil? | | ✓ | ✓ | |
| c. Did the facility clean up and manage properly the released used oil and other materials? | | ✓ | ✓ | |
| d. Did the facility repair or replace any leaking storage containers or tanks to prevent future releases prior to returning them to service? | | ✓ | ✓ | |
| **C. HAZARDOUS WASTE MIXING (279.21)** | | | | |
| 1. Does the generator mix hazardous waste with the used oil? | | ✓ | ✓ | |
| a. Does the mixture exhibit any characteristics of hazardous waste? (If yes, regulated as hazardous waste under Part 262.) | | ✓ | ✓ | |

## SECTION IX CONTINUED

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| b. Does the used oil contain greater than 1,000 ppm total halogens? (If yes, presumed to be hazardous.) | | ✓ | ✓ | |

### D. ON-SITE BURNING IN SPACE HEATERS (279.23)

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| 1. Does the generator burn used oil in used oil-fired space heaters? | | ✓ | ✓ | |
| a. Does the generator burn only used oil generated at the facility or received from household do-it-yourself used oil generators? | | ✓ | ✓ | |
| b. Is the heater designed to have a maximum capacity of not more than 0.5 million Btu per hour? | | ✓ | ✓ | |

### E. OFF-SITE SHIPMENTS (279.24)

| | YES | NO | N/A | VIOLATION |
|---|---|---|---|---|
| 1. Does the generator transport the facility's used oil or used oil from do-it-yourselfers to a used oil collection center? | | ✓ | ✓ | |
| a. Is the used oil transported in a vehicle owned by the facility or an employee? | | ✓ | ✓ | |
| b. Does the generator transport more than 55 gallons at any time? | | ✓ | ✓ | |
| c. Is the collection center registered, licensed, permitted, or recognized by a state/county/ municipal government to manage used oil? | | ✓ | ✓ | |
| 2. Does the generator transport the facility's used oil to an aggregation point? | | ✓ | ✓ | |
| a. Is the used oil transported in a vehicle owned/ operated by the facility or an employee? | | ✓ | ✓ | |
| b. Does the generator transport more than 55 gallons at any time? | | ✓ | ✓ | |
| c. Is the aggregation point owned and/or operated by the same generator? | | ✓ | ✓ | |

## SECTION IX CONTINUED

| | YES | NO | NA | VIOLATION |
|---|---|---|---|---|
| 3. Does the generator have a contractual agreement pursuant to which reclaimed oil is returned by the processor/re-refiner to the generator for use as a lubricant, cutting oil, or coolant? | | ✓ | ✓ | |
| a. Does the contract indicate the type of used oil and the frequency of shipments? | | ✓ | ✓ | |
| b. Does the contract indicate that the vehicle used to transport the used oil to the processing/re-refining facility and to deliver recycled used oil back to the generator is owned and operated by the used oil processor/re-refiner? | | ✓ | ✓ | |
| c. Does the contract indicate that reclaimed oil will be returned to the generator? | | ✓ | ✓ | |
| 4. Does the generator ensure that the used oil is transported only by transporters who have obtained EPA identification numbers? | ✓ | | | |

## F. USED OIL FILTER EXCLUSION (261.4(b)(13))

| | YES | NO | NA | VIOLATION |
|---|---|---|---|---|
| 1. Does the generator manage used oil filters? | | ✓ | ✓ | |
| a. Are the filters non-terne plated? | | ✓ | ✓ | |
| b. Are the filters gravity hot-drained? | | ✓ | ✓ | |

COMMENTS:

used oil is recycled by Safety-Klean
used antifreeze is recycled Safety-Klean

R:\LIST\CHECK.LST (Rev 1/18/95)

# POOR LEGIBILITY

# PORTIONS OF THIS DOCUMENT MAY BE UNREADABLE, DUE TO THE QUALITY OF THE ORIGINAL

# *GEORGIA WELLHEAD PROTECTION PLAN*

*for*

*CITY of FORT VALLEY*

*PEACH COUNTY*

*Permit # 2250001*

*Expiration Date: July 27, 2001*

| | | | |
|---|---|---|---|
| *Field Survey By:* | *Jim Guentert, Sue Grunwald and Sandra Jo Robertson* | | *Date:* *09/23-27/96* |
| *Prepared By:* | *Sandra Jo Robertson* | | *Date:* *10/25/96* |
| *Checked By:* | | *Jim Guentert* | *Date:* *11/25/96* |
| *Checked By:* | | *Sue Grunwald* | *Date:* *11/5/96* |
| *Approved By:* | | *Roger Carter* | *Date:* *12/11/96* |

*Distribution:* *2 GGS Files;* *1 WRMB;* *1 Local Government*

## *SPECIAL NOTE*

At the time this Wellhead Protection Plan (WHPP) was prepared there had been detections in two wells of Perchloroethylene (PCE). Although no PCE has been detected in the treated drinking water, the Fort Valley Water Commission has expressed concern to the Environmental Protection Division and has requested the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources to assist in evaluating the situation. This WHPP, scheduled for preparation upon repermitting of the water system wells in the year 2002, was conducted earlier to assist in this effort.

A separate document, a memorandum dated December 11, 1996 and prepared by the Geologic Survey Branch of EPD, specifically evaluates potential sources of PCE. That memorandum is titled "Preliminary Identification of Potential Sources of Perchloroethylene in Fort Valley Municipal Wells 1 and 2."

# *SYSTEM INFORMATION*

| | |
|---|---|
| *Water System:* | City of Fort Valley |
| *County:* | Peach |
| *System ID. No.:* | 2250001 |
| *Expiration Date:* | 7/27/2001 |
| *Number of Wells:* | 8 (3 abandoned) |
| *System Type:* | municipal |
| *Population:* | 10,500 |
| *Class:* | 2 |
| *Region:* | 2 |
| *Province:* | Coastal Plain |
| *Aquifer Type:* | unconfined coastal plain |
| *Significant Recharge Area:** | yes |
| *Pollution Susceptibility:*** | higher susceptibility |
| *Supplier:* | City of Fort Valley Water System |
| *Contact:* | Mr. Glen Taylor |
| *Title:* | General Manager |
| *Address:* | City of Fort Valley<br>Utility Commission<br>P.O. Box 1529<br>Fort Valley, Georgia 31030-1529 |
| *Phone No.:* | 912-825-7701 |
| *Fax No.:* | 912-825-3177 |
| *WHPA Delineated:* | 09/20/96 |
| *PPSI Conducted:* | 09/23-27/96 |
| *Alternate Water Source:* | The City of Fort Valley has five connected wells. In the event one of the wells can no longer be used the other wells will supply the communities water needs until the well is operational or a new water source can be found. |

*Hydrologic Atlas 18, Most Significant Ground-Water Recharge Areas of Georgia, Georgia Department of Natural Resources, Atlanta, 1989.

**Hydrologic Atlas 20, Ground-Water Pollution Susceptibility Map of Georgia, Georgia Department of Natural Resources, Atlanta, 1992.

## *Part 1: DELINEATING THE WELLHEAD PROTECTION AREA*

see attached maps

### Well #1

(McLean #1)

| | |
|---|---|
| *Location description:* | Located on Central Avenue behind the water treatment plant near the intersection of Railroad St. |
| *Longitude:* | 83° 53' 10.3"W |
| *Latitude:* | 32° 33' 09.5"N |
| *Quadrangle:* | Fort Valley West |
| *Aquifer Type:* | unconfined coastal plain |
| *Delineation Method:* | volumetric flow equation |
| *Pumping Rate:* | 1000 gpm |
| *Cement Pad:* | present |
| *Well House:* | present (locked) |
| *Fence:* | present |
| *Locked Gate:* | present |
| *Control Zone:* | 15 foot radius |
| *Inner-Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1055 foot radius |

### Well #2

(Evans Well)

| | |
|---|---|
| *Location description:* | Located on N. Camellia Boulevard (Georgia Route 49) near the intersection of Miller St. and the railroad crossing. |
| *Longitude:* | 83° 53' 18.5"W |
| *Latitude:* | 32° 33' 02.3"N |
| *Quadrangle:* | Fort Valley West |
| *Aquifer Type:* | unconfined coastal plain |
| *Delineation Method:* | volumetric flow equation |
| *Pumping Rate:* | 1000 gpm |
| *Cement Pad:* | present |
| *Well House:* | present (locked) |
| *Fence:* | not present |
| *Locked Gate:* | not present |
| *Control Zone:* | 15 foot radius |
| *Inner-Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 985 foot radius |

## Well #3

(Jones #1)

| | |
|---|---|
| *Location description:* | Located at the intersection of Jones Alley and State College Drive next to the water treatment plant and across the street from Fort Valley State College |
| *Longitude:* | 83° 53' 50.6"W |
| *Latitude:* | 32° 32' 24.3"N |
| *Quadrangle:* | Fort Valley West |
| *Aquifer Type:* | unconfined coastal plain |
| *Delineation Method:* | volumetric flow equation |
| *Pumping Rate:* | 1000 gpm |
| *Cement Pad:* | present |
| *Well House:* | not present |
| *Fence:* | present |
| *Locked Gate:* | present |
| *Control Zone:* | 15 foot radius |
| *Inner-Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1100 foot radius |

## Well #4

(Jones #2)

| | |
|---|---|
| *Location description:* | Located on Charlevoix St. near the Jones Alley water treatment plant |
| *Longitude:* | 83° 53' 49.7"W |
| *Latitude:* | 32° 32' 29.5"N |
| *Quadrangle:* | Fort Valley West |
| *Aquifer Type:* | unconfined coastal plain |
| *Delineation Method:* | volumetric flow equation |
| *Pumping Rate:* | 1350 gpm |
| *Cement Pad:* | present |
| *Well House:* | not present |
| *Fence:* | present |
| *Locked Gate:* | present |
| *Control Zone:* | 15 foot radius |
| *Inner-Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1180 foot radius |

## Well #5

(Courthouse Well)

| | |
|---|---|
| *Location description:* | Located on Central Avenue next to the Courthouse |
| *Longitude:* | 83° 53' 19.5"W |
| *Latitude:* | 32° 33' 10.6"N |
| *Quadrangle:* | Fort Valley West |
| *Aquifer Type:* | unconfined coastal plain |
| *Delineation Method:* | volumetric flow equation |
| *Pumping Rate:* | 1500 gpm |
| *Cement Pad:* | present |
| *Well House:* | present (locked) |
| *Fence:* | not present |
| *Locked Gate:* | not present |
| *Control Zone:* | 15 foot radius |
| *Inner-Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1490 foot radius |

## Kell Well

| | |
|---|---|
| *Location description:* | Located on Railroad St. near the Camellia Boulevard intersection |
| *Longitude:* | 83° 53' 15.0"W |
| *Latitude:* | 32° 33' 05.5"N |
| *Quadrangle:* | Fort Valley West |
| *Status:* | plugged and abandoned, according to conversation with John Harmon (wellhead has been removed) |

## Nick Well

| | |
|---|---|
| *Location description:* | Located on Central Avenue next to the McLean water treatment plant within a brick storage building. |
| *Longitude:* | 83° 53' 12.3"W |
| *Latitude:* | 32° 33' 09.1"N |
| *Quadrangle:* | Fort Valley West |
| *Status:* | plugged and abandoned, according to conversation with John Harmon |

## Old City Well

| | |
|---|---|
| *Location description:* | Located next to Well #1 at the McLean water treatment plant. |
| *Longitude:* | 83° 53' 09.9"W |
| *Latitude:* | 32° 33' 09.6"N |
| *Quadrangle:* | Fort Valley West |
| *Status:* | plugged and abandoned, according to conversation with John Harmon (the wellhead has been removed and the well paved over with asphalt) |

# PART 2: POTENTIAL POLLUTION SOURCE (PPS) INVENTORY

(see APPENDIX A for reference of PPS Codes)

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 3. | T01 | access and secondary roads |
| 4. | S05 | sewer lines |
| 5. | S08 | water treatment facility (McLean water treatment plant)<br>83° 53' 10.9"W 32° 33' 09.8"N<br>Address: City of Fort Valley<br>Utility Commission<br>P.O. Box 1529<br>Fort Valley, Georgia 31030-1529 |
| 6. | O08 | vehicle parking (located through out the wellhead protection areas) |
| 7. | T03 | major highways and railroads / Norfolk Southern railroad line<br>Address: Norfolk Southern railroad line<br>Chief Dispatcher Atlanta, GA 404-529-1347<br>D.M. Cochran Track Supervisor 404-529-1933 |
| 8. | T05 | railroad depot and loading platform<br>grease, waste oil, and batteries<br>83° 53' 08.5"W 32° 33' 07.2"N<br>Address: Norfolk Southern Corp - Southern Railway System<br>Maintenance of Way<br>200 E. Main St.<br>Fort Valley, GA<br>912-825-7026<br>Chief Dispatcher Atlanta, GA 404-529-1347<br>D.M. Cochran Track Supervisor 404-529-1933 |
| 9. | I10 | storm water runoff |
| 10. | I13 | test well / monitoring well (25 ft. deep, encountered kaolin lens)<br>The well was drilled by the State of Georgia<br>83° 53' 09.8"W 32° 33' 09.4"N |
| 11. | W06 | garbage transfer stations /dumpsters<br>(located throughout the wellhead protection area)<br>BFI Waste Systems<br>4291 Interstate Dr.<br>Macon, Ga<br>912-474-5972 |
| 12. | B23 | storage of paint, fuels, and oils<br>(located in abandoned Nix well house)<br>83° 53' 12.3"W 32° 33' 09.1"N<br>Address: City of Fort Valley<br>Utility Commission<br>P.O. Box 1529<br>Fort Valley, Georgia 31030-1529 |

| PPS # | PPS Code | Description |
|---|---|---|
| 13. | T03 | major highway Georgia Route 49 |
| 14. | T03 | major highway Georgia Route 96 |
| 15. | T03 | major highway U.S. Route 341 |
| 16. | B02 | auto repair / body shop<br>automobile oils and fluids<br>used oils, fluids, and filters are recycled with EnviroSafety<br>83° 53' 15.0"W 32° 33' 08.5"N<br>Address: Peach Mac<br>200 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-8628 |
| 17. | B13 | laundromat / dry cleaner<br>150 gallon trichlorethylene stored within the building<br>filters recycled with EnviroSafety<br>83° 53' 15.5"W 32° 33' 08.0"N<br>Address: Fabra Care Cleaners<br>204 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-8211 |
| 18. | B05 | car wash<br>83° 53' 17.2"W 32° 33' 07.6"N<br>Address: Splish Splash Car Wash<br>208 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>no phone |
| 19. | B23 | tire and oil change<br>used oils are recycled<br>83° 53' 07.1"W 32° 33' 17.2"N<br>Address: Valley Tire Service<br>106 N. Camellia<br>Fort Valley, Georgia 31030<br>912-827-0029 |
| 20. | B23 | marine engine repair<br>waste oil, solvents, paint, fuel<br>83° 53' 10.5"W 32° 33' 19.4"N<br>Address: Mark's Marine Engine Service<br>Route 49 N.<br>Fort Valley, Georgia 31030<br>912-822-9929 |

| PPS # | PPS Code | Description |
|---|---|---|
| 21. | B23 | auto detailing / car wash / window tinting<br>(previously Butler Chevrolet new and used car sales lot)<br>83° 53' 09.0"W 32° 33' 19.2"N<br>Mose's Car Customs<br>121 N Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-0152 |
| 22. | F04 | underground fuel storage tanks / diesel<br>83° 53' 12.8"W 32° 33' 16.3"N<br>Address: Bell South<br>110 Anderson Ave.<br>Fort Valley, Georgia 31030<br>912-780-2800 |
| 23. | F05 | abandoned underground fuel storage tanks<br>83° 53' 18.0"W 32° 33' 15.4"N<br>Address: Fort Valley Fire Station 1<br>W. Church St.<br>Fort Valley, Georgia 31030<br>912-825-5190 |
| 24. | B10<br>F04 | gasoline station / service bay / engine repair / oil and fluid change<br>underground fuel storage tank<br>83° 53' 22.3"W 32° 32' 55.5"N<br>Address: C&M Auto<br>Samuel Jones St.<br>Fort Valley, Georgia 31030 |
| 25. | B10<br>F04 | gasoline station / service bay / oil and fluid change<br>underground fuel storage tank<br>83° 53' 22.0"W 32° 32' 56.9"N<br>Address: Walker Union 76 Service Sation<br>525 Railroad St.<br>Fort Valley, Georgia 31030<br>912-825-3239 |
| 26. | F04 | underground fuel storage tank<br>83° 53' 25.1"W 32° 32' 57.7"N<br>Address: Bobby's Minit Mart Grocery<br>Fina Gas Station<br>702 Orange St.<br>Fort Valley, Georgia 31030<br>912-825-5249 |
| 27. | B14 | machine shop<br>Safety clean wash for machine parts<br>83° 53' 09.3"W 32° 33' 04.8"N<br>Address: Anthoine Machine Works<br>311 Railroad St.<br>Fort Valley, Georgia 31030<br>912-825-5613 |

| PPS # | PPS Code | Description |
|---|---|---|
| 28. | B02 | auto repair / fuel and oil change<br>motor oils / fluids / waste oil and waste fluids<br>83° 53' 04.0"W 32° 33' 07.8"N<br>Address: Giles Garage<br>303 Martin Luther King Jr. St.<br>Fort Valley, Georgia 31030<br>912-825-3779 |
| 29. | F05<br>B05<br>B23 | abandoned underground fuel storage tanks<br>car wash<br>oil change / window tinting and detail<br>83° 53' 04.7" 32° 33' 08.4"<br>Address: Auto Shade<br>One Stop Auto Service<br>301 Martin Luther King Jr. St.<br>Fort Valley, Georgia 31030<br>912-825-1666 |
| 30. | B23 | tire / motor oil / fluid change<br>used oils and fluids are recycled<br>83° 53' 02.7"W 32° 33' 04.6"N<br>Address: Holcomb Tire Service<br>306 Martin Luther King Dr.<br>Fort Valley, Georgia 31030<br>912-825-5256 |
| 31. | A06 | fertilizer storage<br>liquid nitrogen storage tanks (have spill containment systems)<br>83° 53' 23.7"W 32° 33' 00.7"N<br>Address: Fort Valley Oil Company Fertilizers and Lime<br>304 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-5531 |
| 32. | A06 | fertilizer storage<br>83° 53' 20.3"W 32° 33' 01.6"N<br>Address: Fort Valley Oil Company Fertilizers and Lime<br>.304 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-5531 |
| 33. | F01 | above ground fuel storage tanks<br>diesel / hydraulic fluid / engine oil ( has spill containment system)<br>83° 53' 22.0"W 32° 33' 02.7"N<br>Address: Fort Valley Oil Company Fertilizers and Lime<br>304 S. Camellia Blvd.<br>Fort Valley, Georgia 31030<br>912-825-5531 |

| PPS # | PPS Code | Description |
|---|---|---|
| 34. | S08 | water treatment facility (Jones Alley water treatment plant)<br>83° 53' 51.5"W 32° 32' 24.5"N<br>Address: City of Fort Valley<br>Utility Commission<br>P.O. Box 1529<br>Fort Valley, Georgia 31030-1529 |
| 35. | F04 | underground fuel storage tanks<br>83° 53' 55.9"W 32° 32' 19.4"N<br>Address: Highway Haven Food Store #2<br>Community Plaza<br>Chevron gas station<br>1200 State College Drive<br>Fort Valley, Georgia 31030<br>912-825-9085 |
| 36. | B13 | laundromat / dry cleaning<br>83° 53' 56.0"W 32° 32' 19.2"N<br>Address: Coin-Op Laundry / Dry Cleaning<br>State College Drive<br>Fort Valley, Georgia 31030 |
| 37. | B23 | auto paint and body shop<br>paints / solvents<br>83° 53' 56.1"W 32° 32' 18.9"N<br>Address: Appling's Paint and Body Shop<br>1206 State College Drive<br>Fort Valley, Georgia 31030<br>912-825-1220 |
| 38. | S01 | domestic septic system<br>83° 53' 52.0"W 32° 32' 23.4"N<br>Address: 405 Jones Alley<br>Fort Valley, Georgia 31030 |
| 39. | I02 | domestic wells |
| 40. | H05 | hazardous waste NPL location<br>registered NPL clean-up site.<br>83° 53' 11.7"W 32° 33' 02.8"N |
| 41. | B14 | machine shop (historical)<br>There is only a vacant lot at this location now. Approximately 50 years ago Eberhard machine shop was located here.<br>83° 53' 09.0"W 32° 33' 05.4"N |
| 42. | B23 | knitting mill (historical)<br>The knitting mill was destroyed by a tornado in 1975.<br>83° 53' 10.0"W 32° 33' 07.8"N |
| 43. | B23 | power generating plant (historical)<br>A power generating plant was once located at the present day McLean water treatment plant.<br>83° 53' 10.3"W 32° 33' 09.5"N |

| PPS # | PPS Code | Description |
|---|---|---|
| 44. | B13 | dry cleaners (historical)<br>A dry cleaners was once located at the present day Splish Splash car wash.<br>83° 53' 17.2"W 32° 33' 07.6"N |
| 45. | B17 | printers (historical)<br>A print shop was once located here. The building is abandoned.<br>83° 53' 13.9"W 32° 33' 08.0"N |
| 46. | B23 | cotton storage warehouse / rail transfer area (historical)<br>Trains passed through this area where a warehouse that stored cotton was once located.<br>83° 53' 13.0"W 32° 33' 07.4"N |
| 47. | B23 | cotton seed oil mill (historical)<br>83° 53' 12.7"W 32° 33' 06.5"N |
| 48. | B13 | dry cleaners (historical)<br>A dry cleaners was once located in the alley approximately 50 feet north of well #1<br>83° 53' 10.0"W 32° 33' 10.1"N |
| 49. | B13 | dry cleaners (historical)<br>Located on GA Route 49, the building now houses a law office.<br>83° 53' 12.1"W 32° 33' 13.0"N |
| 50. | B13 | dry cleaners (historical)<br>Located on Church approximately 50 feet east of PPS #49<br>83° 53' 12.5"W 32° 33' 13.0"N |
| 51. | B23 | gasoline station (historical)<br>No evidence of the gasoline station today. Formerly located at the corner of Central Avenue and GA Route 49.<br>83° 53' 14.4"W 32° 33' 09.0"N |
| 52. | B23 | gasoline station (historical)<br>No evidence of the gasoline station today. Formerly located at the corner of College Street and GA Route 49.<br>83° 53' 17.1"W 32° 33' 05.3"N |

## *Well #1*

***Control Zone***
15 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 10. | I13 | test well / monitoring well |

***Inner-Management Zone:***
250 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 3. | T01 | access and secondary roads |
| 4. | S05 | sewer lines |
| 5. | S08 | water treatment facility (McLean water treatment plant) |
| 6. | O08 | vehicle parking |
| 7. | T03 | major highways and railroads / Norfolk Southern railroad |
| 8. | T05 | railroad depot and loading platform |
| 9. | I10 | storm water runoff |
| 11. | W06 | garbage transfer stations / dumpsters |
| 12. | B23 | storage of fuels, paints, and oils |
| 15. | T03 | major highway / U.S. Route 341 |
| 43. | B23 | power generating plant (historical, no longer presaent) |
| 48. | B13 | dry cleaners (historical, no longer present) |

***Outer-Management Zone***
1055 foot radius

*Note:* PPS's 1, 2, 3, 4, 6, 7, 8, 9, 11 and 15 are also found in the Outer-Management Zone.

| PPS # | PPS Code | Description |
|---|---|---|
| 13. | T03 | major highway Georgia Route 49 |
| 14. | T03 | major highway Georgia Route 96 |
| 16. | B02 | auto repair / body shop |
| 17. | B13 | laundromat / dry cleaners |
| 18. | B05 | car wash |
| 19. | B23 | tire and oil change |
| 20. | B23 | marine engine repair |
| 21. | B23 | auto detailing / car wash / window tinting |
| 22. | F04 | underground fuel storage tanks / diesel |
| 23. | F05 | abandoned underground fuel storage tanks |
| 27. | B14 | machine shop |
| 28. | B02 | auto repair / fuel and oil change |
| 29. | F05 | abandoned underground fuel storage tanks |
| | B05 | car wash |
| | B23 | oil change / window tinting and detail |
| 30. | B23 | tire / motor oil / fluid change |
| 39. | I02 | domestic wells |

## *Well #1* *(continued)*

*Outer-Management Zone continued*
1055 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 40. | H05 | hazardous waste NPL site (former Woolfolk Chemical Site) |
| 41. | B14 | machine shop (historical, no longer present) |
| 42. | B23 | knitting mill (historical, no longer present) |
| 44. | B13 | dry cleaners (historical, no longer present) |
| 45. | B17 | printers (historical, currently an unoccupied building) |
| 46. | B23 | cotton storage warehouse / rail transfer area (historical, no longer present) |
| 47. | B23 | cotton seed oil mill (historical, no longer present) |
| 49. | B13 | dry cleaners (historical, no longer present) |
| 50. | B13 | dry cleaners (historical, no longer present) |
| 51. | B23 | gasoline station (historical, no longer present) |
| 52. | B23 | gasoline station (historical, no longer present) |

## *Well #2*

*Control Zone*
15 foot radius
No Potential Pollution Sources

*Inner-Management Zone*
250 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 4. | S05 | sewer lines |
| 6. | O08 | vehicle parking |
| 7. | T03 | major highways and railroads / Norfolk Southern railroad |
| 9. | I10 | storm water runoff |
| 13. | T03 | major highway Georgia Route 49 |
| 42. | B23 | knitting mill (historical, no longer present) |

## *Well #2 (continued)*

### *Outer-Management Zone continued*

985 foot radius

*Note:* PPS's 1, 2, 4, 6, 7, 9, and 13 are also found in the Outer-Management Zone.

| PPS # | PPS Code | Description |
|---|---|---|
| 3. | T01 | access and secondary roads |
| 5. | S08 | water treatment facility (McLean water treatment plant) |
| 8. | T05 | railroad depot and loading platform |
| 10. | I13 | test well / monitoring well |
| 11. | W06 | garbage transfer stations / dumpsters |
| 12. | B23 | storage of paint, fuels, and oils |
| 16. | B02 | auto repair / body shop |
| 17. | B13 | laundromat / dry cleaner |
| 18. | B05 | car wash |
| 24. | B10 | gasoline station / service bay / engine repair / oil change |
| | F04 | underground fuel storage tank |
| 25. | B10 | gasoline station / service bay / oil change |
| | F04 | underground fuel storage tank |
| 26. | F04 | underground fuel storage tank |
| 27. | B14 | machine shop |
| 31. | A06 | fertilizer storage / liquid nitrogen storage tanks |
| 32. | A06 | fertilizer storage |
| 33. | F01 | above ground fuel storage tanks |
| 39. | I02 | domestic wells |
| 40. | H05 | hazardous waste NPL site |
| 41. | B14 | machine shop (historical, no longer present) |
| 42. | B23 | knitting mill (historical, no longer present) |
| 43. | B23 | power generating plant (historical, no longer present) |
| 44. | B13 | dry cleaners (historical, no longer present) |
| 45. | B17 | printers (historical, currently an unoccupied building) |
| 46. | B23 | cotton storage warehouse / rail transfer area (historical, no longer present) |
| 47. | B23 | cotton seed oil mill (historical, no longer present) |
| 51. | B23 | gasoline station (historical, no longer present) |
| 52. | B23 | gasoline station (historical, no longer present) |

## *Well #3*

***Control Zone***
15 foot radius
No Potential Pollution Sources

***Inner-Management Zone***
250 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 3. | T01 | access and secondary roads |
| 4. | S05 | sewer lines |
| 6. | O08 | vehicle parking |
| 11. | W06 | garbage transfer stations / dumpsters |
| 34. | S08 | water treatment facility (Jones Alley water treatment plant) |
| 38. | S01 | domestic septic system |

***Outer-Management Zone***
1100 foot radius

*Note:* PPS's 1, 2, 3, 4, 6, and 11 are also found in the Outer-Management Zone.

| PPS # | PPS Code | Description |
|---|---|---|
| 7. | T03 | major highways and railroads / Norfolk Southern railroad |
| 35. | F04 | underground fuel storage tanks |
| 36. | B13 | laundromat / dry cleaning |
| 37. | B23 | auto paint and body shop |
| 39. | I02 | domestic wells |

## *Well #4*

***Control Zone***
15 foot radius
No Potential Pollution Sources

***Inner-Management Zone***
250 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 3. | T01 | access and secondary roads |
| 4. | S05 | sewer lines |
| 6. | O08 | vehicle parking |
| 11. | W06 | garbage transfer stations / dumpsters |

***Outer-Management Zone***
1180 foot radius

*Note:* PPS's 1, 2, 3, 4, 6, and 11 are also found in the Outer-Management Zone.

| PPS # | PPS Code | Description |
|---|---|---|
| 7. | T03 | major highways and railroads / Norfolk Southern railroad |
| 34. | S08 | water treatment facility (Jones Alley water treatment plant) |
| 35. | F04 | underground fuel storage tanks |
| 36. | B13 | laundromat / dry cleaning |
| 37. | B23 | auto paint and body shop |
| 38. | S01 | domestic septic system |
| 39. | I02 | domestic wells |

## *Well #5*

***Control Zone***
15 foot radius
No Potential Pollution Sources

***Inner-Management Zone***
250 foot radius

| PPS # | PPS Code | Description |
|---|---|---|
| 1. | O07 | utility poles |
| 2. | O04 | electrical transformers |
| 3. | T01 | access and secondary roads |
| 4. | S05 | sewer lines |
| 6. | O08 | vehicle parking |
| 9. | I10 | storm water runoff |
| 11. | W06 | garbage transfer stations / dumpsters |

***Outer-Management Zone***
1490 foot radius

*Note:* PPS's 1, 2, 3, 4, 6, 9 and 11 are also found in the Outer-Management Zone.

| PPS # | PPS Code | Description |
|---|---|---|
| 5. | S08 | water treatment facility (McLean) |
| 7. | T03 | major highways and railroads |
| 8. | T05 | railroad depot and loading platform |
| 10. | I13 | test well / monitoring well |
| 11. | W06 | garbage transfer stations / dumpsters |
| 12. | B23 | storage of paint, fuels, and oils |
| 13. | T03 | major highway Georgia Route 49 |
| 15. | T03 | major highway U.S. Route 341 |
| 16. | B02 | auto repair / body shop |
| 17. | B13 | laundromat / dry cleaner |
| 18. | B05 | car wash |
| 19. | B23 | tire and oil change |
| 20. | B23 | marine engine repair |
| 21. | B23 | auto detailing / car wash / window tinting |
| 22. | F04 | underground fuel storage tanks / diesel |
| 23. | F05 | abandoned underground fuel storage tanks |
| 24. | B10 | gasoline station / service bay / engine repair / oil change |
| | F04 | underground fuel storage tank |
| 25. | B10 | gasoline station / service bay / oil change |
| | F04 | underground fuel storage tank |
| 26. | F04 | underground fuel storage tank |
| 27. | B14 | machine shop |
| 28. | B02 | auto repair / fuel and oil change |

## *Well #5 (continued)*

### *Outer-Management Zone continued*

| PPS # | PPS Code | Description |
|---|---|---|
| 29. | F05 | abandoned underground fuel storage tanks |
| | B05 | car wash |
| | B23 | oil change / window tinting and detail |
| 30. | B23 | tire / motor oil / fluid change |
| 31. | A06 | fertilizer storage / liquid nitrogen storage tanks |
| 32. | A06 | fertilizer storage |
| 33. | F01 | above ground fuel storage tanks |
| 39. | I02 | domestic wells |
| 40. | H05 | hazardous waste NPL site |
| 41. | B14 | machine shop (historical, no longer present) |
| 42. | B23 | knitting mill (historical, no longer present) |
| 43. | B23 | power generating plant (historical, no longer present) |
| 44. | B13 | dry cleaners (historical, no longer present)) |
| 45. | B17 | printers (historical, currently an unoccupied building) |
| 46. | B23 | cotton storage warehouse / rail transfer area (historical, no longer present) |
| 47. | B23 | cotton seed oil mill (historical, no longer present) |
| 48. | B13 | dry cleaners (historical, no longer present) |
| 49. | B13 | dry cleaners (historical, no longer present) |
| 50. | B13 | dry cleaners (historical, no longer present) |
| 51. | B23 | gasoline station (historical, no longer present) |
| 52. | B23 | gasoline station (historical, no longer present) |

# *Part 3: MANAGEMENT PLAN*

***Local Wellhead Protection Ordinance***

No

***Responsibilities of the Georgia Environmental Protection Division***

Within the Inner- and Outer-Management Zones EPD shall :

- not issue any new permits for municipal solid waste, industrial waste and construction/demolition waste landfills;
- not issue any new permits for the land disposal of hazardous wastes;
- require all new facilities permitted to handle, treat, store or dispose of hazardous waste or hazardous materials perform such operations on an impermeable pad having a spill and leak collection system;
- require all new agricultural waste impoundments have an impermeable synthetic liner;
- not issue any new permits for land application of waste water or sludge;
- not issue any new permits for underground injection wells;
- not issue permits for any new quarries or underground mines unless a hydrogeological investigation is completed;
- require all new underground storage tanks meet the highest standards applicable under the UST Act;
- require all new waste water treatment basins to have an impermeable synthetic liner.

***Recommendations to Local Governments from the Georgia Environmental Protection Division (EPD)***

EPD recommends that the local governments develop and adopt a local Wellhead Protection Ordinance.

PPS #1. PPS code O07 utility poles

The City of Fort Valley should be aware that telephone and utility poles are treated with coal tar creosote or other wood preservatives.

PPS #2. PPS code O04 electrical transformers

The City of Fort Valley should periodically check electrical transformers for cracks and leaks in the event of accidental or storm damage. Damaged transformers should be reported to the local utility provider.

PPS #3. PPS code T01 access and secondary roads

The City of Fort Valley should report all hazardous waste and petroleum product spills or releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

PPS #4. PPS code S05 sewer lines

The City of Fort Valley should properly maintain sewer lines and repair all sewer line breaks and leaks. In the event of a sewer line break or leak The City of Fort Valley should report the incident to the Georgia Department of Natural Resources, Water Protection Branch, Municipal Permitting Program, 4244 International Parkway, Suite 110, Atlanta, Georgia 30354, (404) 362-2680.

PPS #5. PPS code S08 water treatment facility (McLean water treatment plant)

The City of Fort Valley should operate the water treatment facility in accordance with permit conditions and report problems to the Georgia Environmental Protection Division, Water Resources Management Branch, Drinking Water Permitting Program, 205 Butler St. SE, Floyd Tower East, Suite 1358, Atlanta, Georgia 30334, (404) 656-5660.

***Recommendations to Local Governments from the Georgia EPD continued***

PPS #6. PPS code O08 vehicle parking

The City of Fort Valley should recommend residents and business owners restrict vehicle parking to designated paved areas where available.

PPS #7. PPS code T03 major highways and railroads / Norfolk Southern railroad

The City of Fort Valley should report all hazardous waste or petroleum product spills or releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

PPS #8. PPS code T05 railroad depot and loading platform

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #9. PPS code I10 storm water runoff

The City of Fort Valley should be aware that storm water runoff from parking areas may contain volatile organic compounds. Storm water runoff from residential areas may contain pesticides and fertilizers.

PPS #10. PPS code I13 test well / monitoring well

The City of Fort Valley should require the monitoring well be properly secured and maintained. After the monitoring well is abandoned the City of Fort Valley should require the well be properly grouted and plugged according to the specifications of Circular 13 Grouting and Plugging of Domestic Water Wells in Georgia, available through the Georgia Geologic Survey Publications Office (404) 657-6127.

PPS #11. PPS code W06 garbage transfer station / dumpsters

Garbage transfer stations are considered to be solid waste transfer stations. The City of Fort Valley should recommend businesses properly dispose of solid wastes. For more information contact the Solid Waste Management Program (404) 362-2692.

PPS #12. PPS code B23 storage for fuels, paint, and oils

The City of Fort Valley should use best management practices in the operation of their business. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #13. PPS code T03 major highways and railroads / Georgia Route 49

The City of Fort Valley should report all hazardous waste or petroleum product spills or releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

PPS #14. PPS code T03 major highways and railroads / Georgia Route 96

The City of Fort Valley should report all hazardous waste or petroleum product spills or releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

***Recommendations to Local Governments from the Georgia EPD continued***

PPS #15. PPS code T03 major highways and railroads / Georgia Route 341

The City of Fort Valley should report all hazardous waste or petroleum product spills or releases occurring within the wellhead protection area to the Department of Natural Resources at 1-800-241-4133.

PPS #16. PPS code B02 auto repair / body shop

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #17. PPS code B13 laundromat / dry cleaner

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Hazardous materials should be properly disposed of. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

PPS #18. PPS code B05 car wash

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #19. PPS code B23 tire and oil change

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #20. PPS code B23 marine engine repair

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #21. PPS code B23 auto detailing / car wash / window tinting

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

***Recommendations to Local Governments from the Georgia EPD continued***

PPS #22. PPS code F04 underground fuel storage tanks / diesel

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS #23. PPS code F05 abandoned underground fuel storage tank

The City of Fort Valley should recommend owners of underground storage tanks adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15-.11 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS #24. PPS code B10 gasoline station / service bay / engine repair / oil and fluid change

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS code F04 underground fuel storage tank

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS #25. PPS code B10 gasoline station / service bay / oil and fluid change

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS code F04 underground fuel storage tank

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

***Recommendations to Local Governments from the Georgia EPD continued***

PPS #26. PPS code F04 underground fuel storage tank

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS #27. PPS code B14 machine shop

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Hazardous materials should be properly disposed of. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

PPS #28. PPS code B02 auto repair / fuel and oil change

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #29. PPS code F05 abandoned underground fuel storage tanks

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS code B05 car wash

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS code B23 oil change / window tinting and detail

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

PPS #30. PPS code B23 tire / motor oil / fluid change

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils and fluids should be properly disposed of. A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Drive, Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

***Recommendations to Local Governments from the Georgia EPD continued***

PPS #31. PPS code A06 fertilizer storage

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Liquid fertilizer should have a spill containment system. Spills should be reported to the Department of Natural Resources at 1-800-241-4133. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

PPS #32. PPS code A06 fertilizer storage

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

PPS #33. PPS code F01 above ground fuel storage tank

The City of Fort Valley should recommend businesses have a spill containment system large enough to contain the entire volume of material. Petroleum product spills or releases should be reported to the Department of Natural Resources at 1-800-241-4133. For more information concerning above ground fuel storage tanks contact the Georgia Office of Commissioner of Insurance, State Fire Marshall, Hazardous Materials, (404) 656-9798.

PPS #34. PPS code S08 water treatment facility (Jones Alley)

The City of Fort Valley should operate the water treatment facility in accordance with permit conditions and report problems to the Georgia Environmental Protection Division, Water Resources Management Branch, Drinking Water Permitting Program, 205 Butler St. SE, Floyd Tower East, Suite 1358, Atlanta, Georgia 30334, (404) 656-5660.

PPS #35. PPS code F04 underground fuel storage tanks

The City of Fort Valley should recommend business owners adhere to the Rules of Georgia Department of Natural Resources Environmental Protection Division Chapter 391-3-15 Underground Storage Tank Management. Questions concerning underground storage tank rules should be addressed to the Georgia Department of Natural Resources Environmental Protection Division Underground Storage Tank Program (404) 362-2687.

PPS #36. PPS code B13 laundromat / dry cleaning

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Hazardous materials should be properly disposed of. For more information contact the Georgia Environmental Protection Division, Commercial Industrial Unit, (404) 362-4511.

PPS #37. PPS code B23 auto paint and body shop

The City of Fort Valley should recommend businesses use best management practices in the operation of their business. Used oils, fluids, and paints should be properly disposed . A list of educational materials on water quality issues can be obtained from the Georgia Environmental Protection Division, Water Quality Management Program, 7 Martin Luther King Jr. Dr., Suite 643, Atlanta, Georgia 30334, (404) 656-4934.

***Recommendations to Local Governments from the Georgia EPD continued***

PPS #38. PPS code S01 domestic septic system

The City of Fort Valley should recommend home owners properly operate and maintain their septic system. Contact the Peach County Health Department for more information concerning proper septic tank operation and maintenance.

PPS #39. PPS code I02 domestic wells

The City of Fort Valley should recommend property owners protect their own wells from pollutants. Well owners should periodically test for water quality. If problems are identified by the water test, contact a water treatment specialist for recommendations. For more information contact the Georgia Cooperative Extension Service Branch office in Peach County.

The City of Fort Valley should recommend property owners properly grout and plug abandoned wells according to the specifications of Circular 13 Grouting and Plugging of Domestic Water Wells in Georgia, available through the Georgia Geologic Survey Publications Office (404) 657-6127. For more information contact the Department of Natural Resources, Georgia Geologic Survey, 19 Martin Luther King Jr. Dr. SW, Atlanta, Georgia, 30334 (404) 656-3214.

PPS #40. PPS code H05 hazardous waste NPL location

The hazardous waste clean up activities are currently under the direction of the Georgia Department of Natural Resources, Hazardous Waste Management Branch. For more information contact the Department of Natural Resources, Hazardous Waste Management Branch, 205 Butler Street, S.E., Floyd Towers East, Suite 1154, Atlanta, Georgia, 30334 (404) 656-7802.

PPS #41. PPS code B14 machine shop (historical, no longer present)

Historical information. The machine shop was in operation during the 1920's.

PPS #42. PPS code B23 knitting mill (historical, no longer present)

Historical information. The knitting mill was destroyed by a tornado in 1975.

PPS #43. PPS code B23 power generating plant (historical, no longer present)

Historical information. The power plant used to be in the same location currently occupied by McLean water treatment plant.

PPS #44. PPS code B13 dry cleaners (historical, no longer present)

Historical information. The dry cleaners used to be in the same location currently occupied by Splish Splash car wash.

PPS #45. PPS code B17 printers (historical, currently an unoccupied building))

Historical information. The printing company has moved from this location.

PPS #46. PPS code B23 cotton storage warehouse / rail transfer area (historical, no longer present)

Historical information. The cotton storage warehouse / rail transfer area was removed and the location is now a vacant lot. Remnants of the track are still evident.

PPS #47. PPS code B23 cotton seed oil mill (historical, no longer present)

Historical information. The cotton storage warehouse / rail transfer area was removed and the location is now a vacant lot.

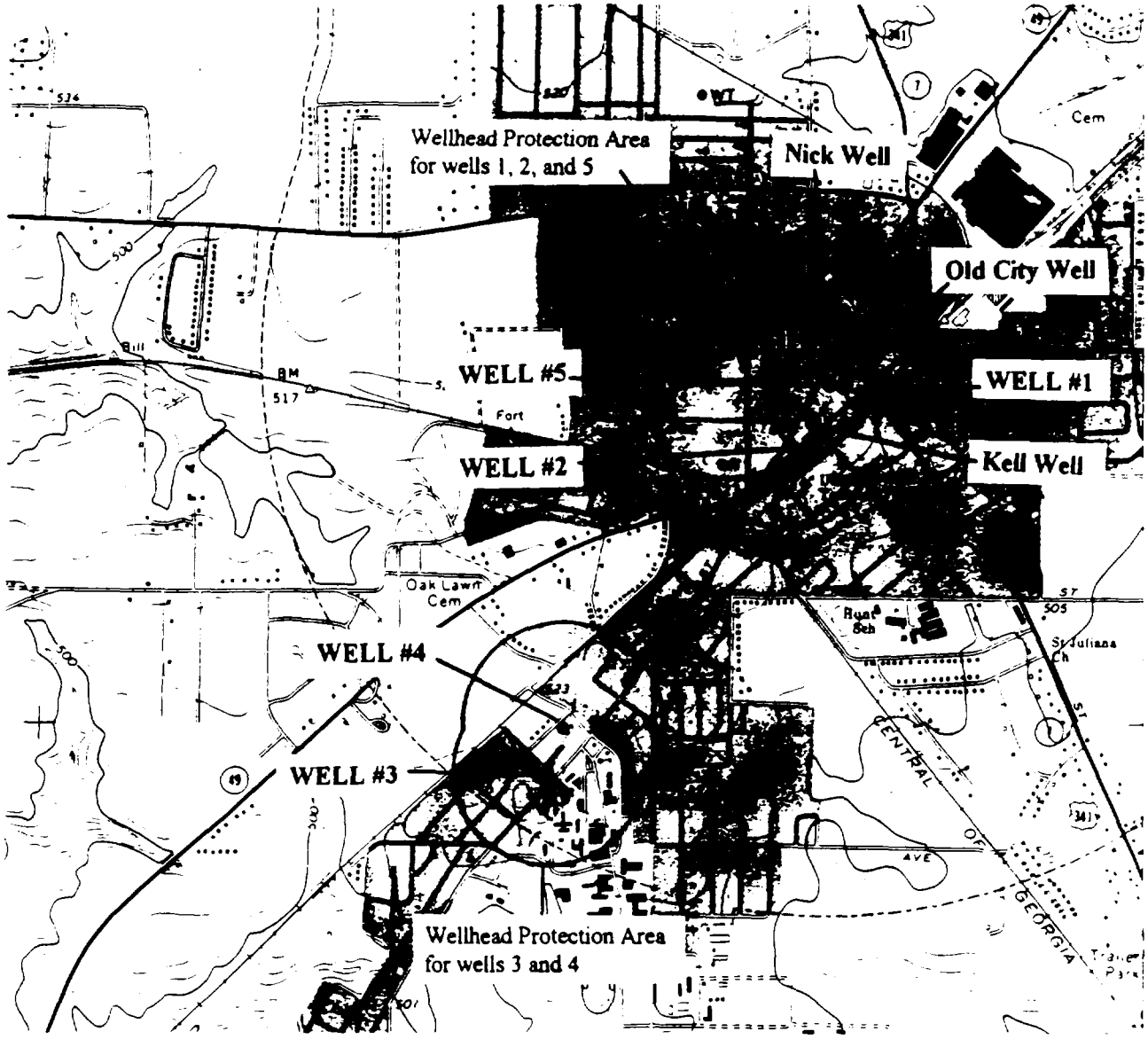
***Recommendations to Local Governments from the Georgia EPD continued***

PPS #48. PPS code B13 dry cleaners (historical, no longer present)
Historical information.
PPS #49. PPS code B13 dry cleaners (historical, no longer present)
Historical information.
PPS #50. PPS code B13 dry cleaners (historical, no longer present)
Historical information.
PPS #51. PPS code B23 gasoline station (historical, no longer present)
Historical information.
PPS #52. PPS code B23 gasoline station (historical, no longer present)
Historical information.

## *Part 4: CONTINGENCY PLAN*

The City of Fort Valley has five connected wells. In the event one of the wells can no longer be used the other wells will supply the communities water needs until the well is operational or a new water source can be found.

# City of Fort Valley
# Wellhead Protection Areas

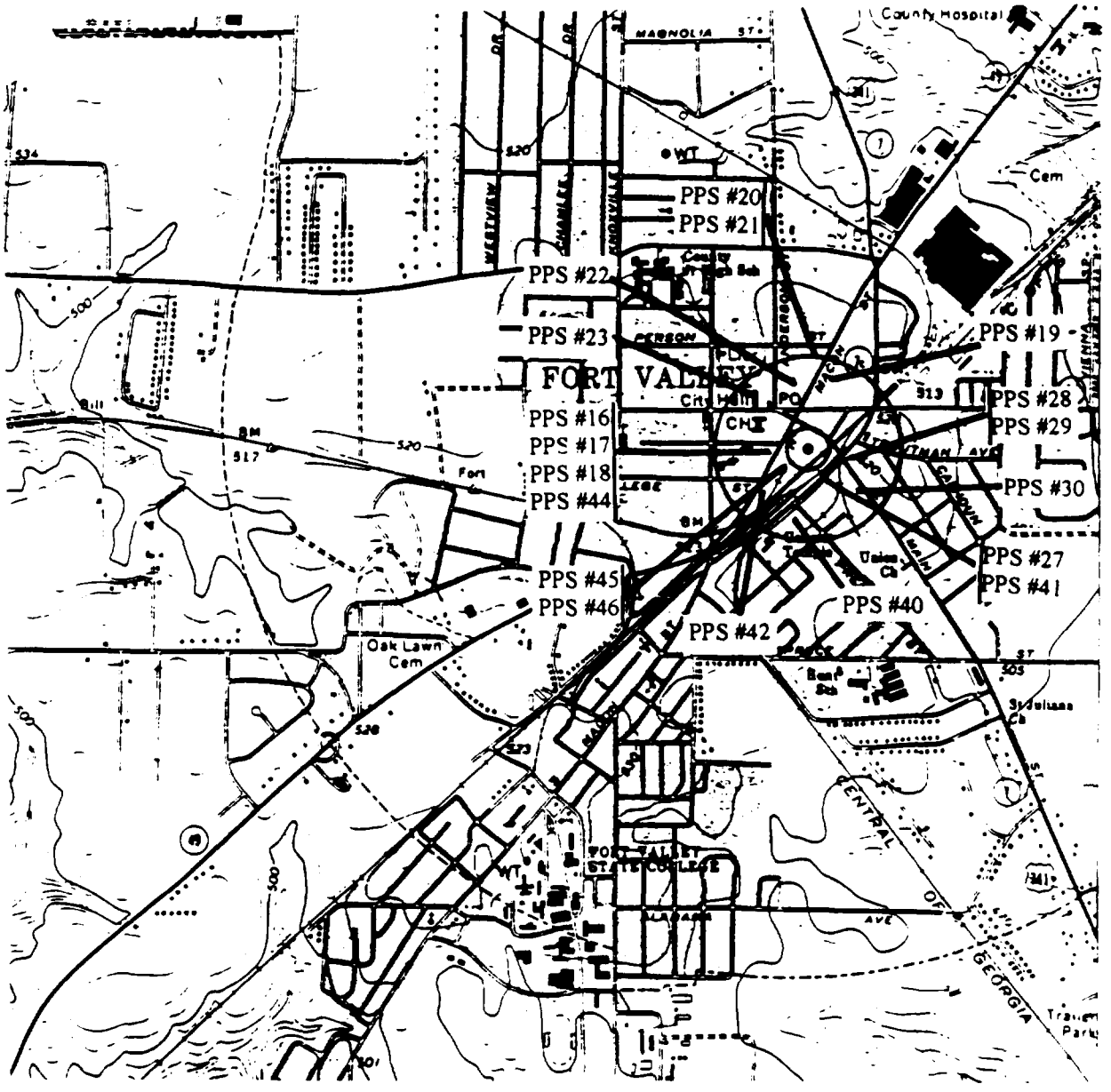



*Quadrangle:* Fort Valley West

| | Well #1 | Well #2 | Well #3 | Well #4 | Well #5 |
|---|---|---|---|---|---|
| *Longitude:* | 83° 53' 10.3"W | 83° 53' 18.5"W | 83° 53' 50.6"W | 83° 53' 49.7"W | 83° 53' 19.5"W |
| *Latitude:* | 32° 33' 09.5"N | 32° 33' 02.3"N | 32° 32' 24.3"N | 32° 32' 29.5"N | 32° 33' 10.6"N |
| *CZ:* | 15 foot radius | 15 foot radius | 15 foot radius | 15 foot radius | 15 foot radius |
| *IMZ:* | 250 foot radius | 250 foot radius | 250 foot radius | 250 foot radius | 250 foot radius |
| *Omz:* | 1055 foot radius | 985 foot radius | 1100 foot radius | 1180 foot radius | 1490 foot radius |

| | Kell Well | Nick Well | Old City Well |
|---|---|---|---|
| *Longitude:* | 83° 53' 15.0"W | 83° 53' 12.3"W | 83° 53' 09.9"W |
| *Latitude:* | 32° 33' 05.5"N | 32° 33' 09.1"N | 32° 33' 09.6"N |
| *Status:* | abandoned | abandoned | abandoned |

# City of Fort Valley
# Well #1
# Wellhead Protection Area

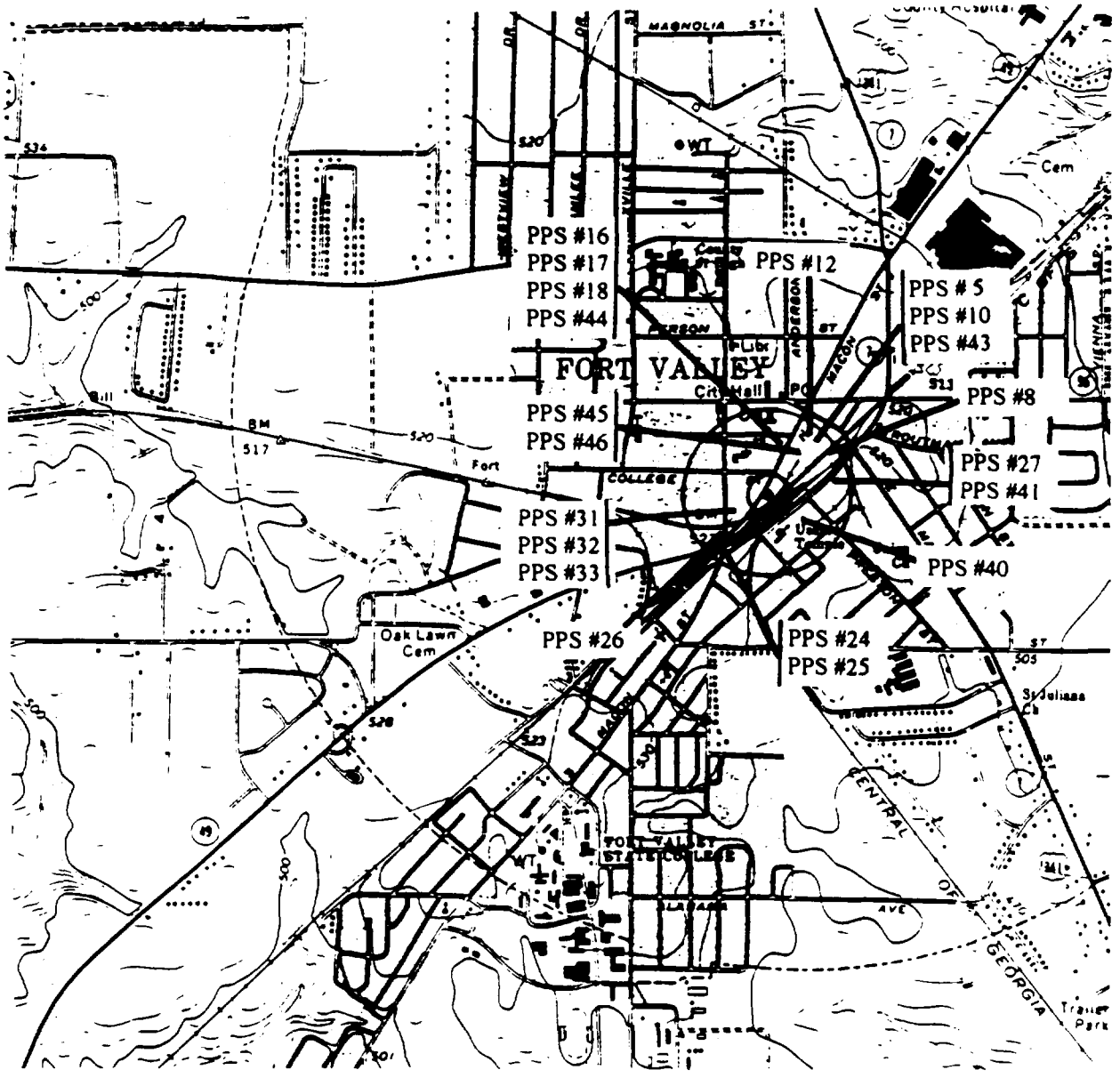



| | |
|---|---|
| *Quadrangle:* | Fort Valley West |
| *Longitude:* | 83° 53' 10.3"W |
| *Latitude:* | 32° 33' 09.5"N |
| *Control Zone:* | 15 foot radius |
| *Inner- Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1055 foot radius |

Potential Pollution Sources (PPS) of the IMZ are not shown on this map

Potential Pollution Sources (PPS) not shown on this map are listed on pages 11 and 12

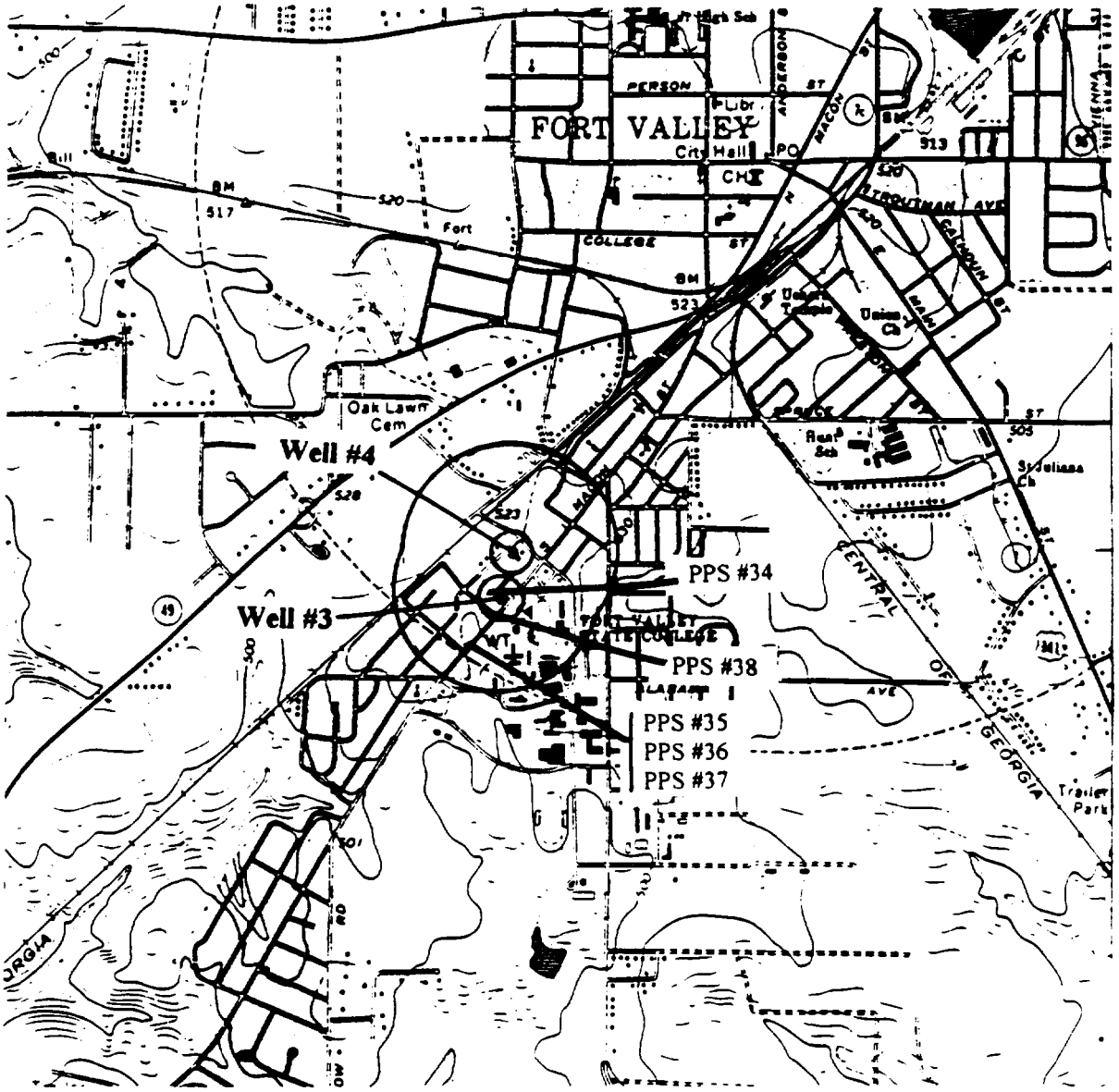
# City of Fort Valley
# Well #2
# Wellhead Protection Area




| | |
|---|---|
| *Quadrangle:* | Fort Valley West |
| *Longitude:* | 83° 53' 18.5"W |
| *Latitude:* | 32° 33' 02.3"N |
| *Control Zone:* | 15 foot radius |
| *Inner- Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 985 foot radius |

Potential Pollution Sources (PPS) of the IMZ are not shown on this map
Potential Pollution Sources (PPS) not shown on this map are listed on page 12 and 13

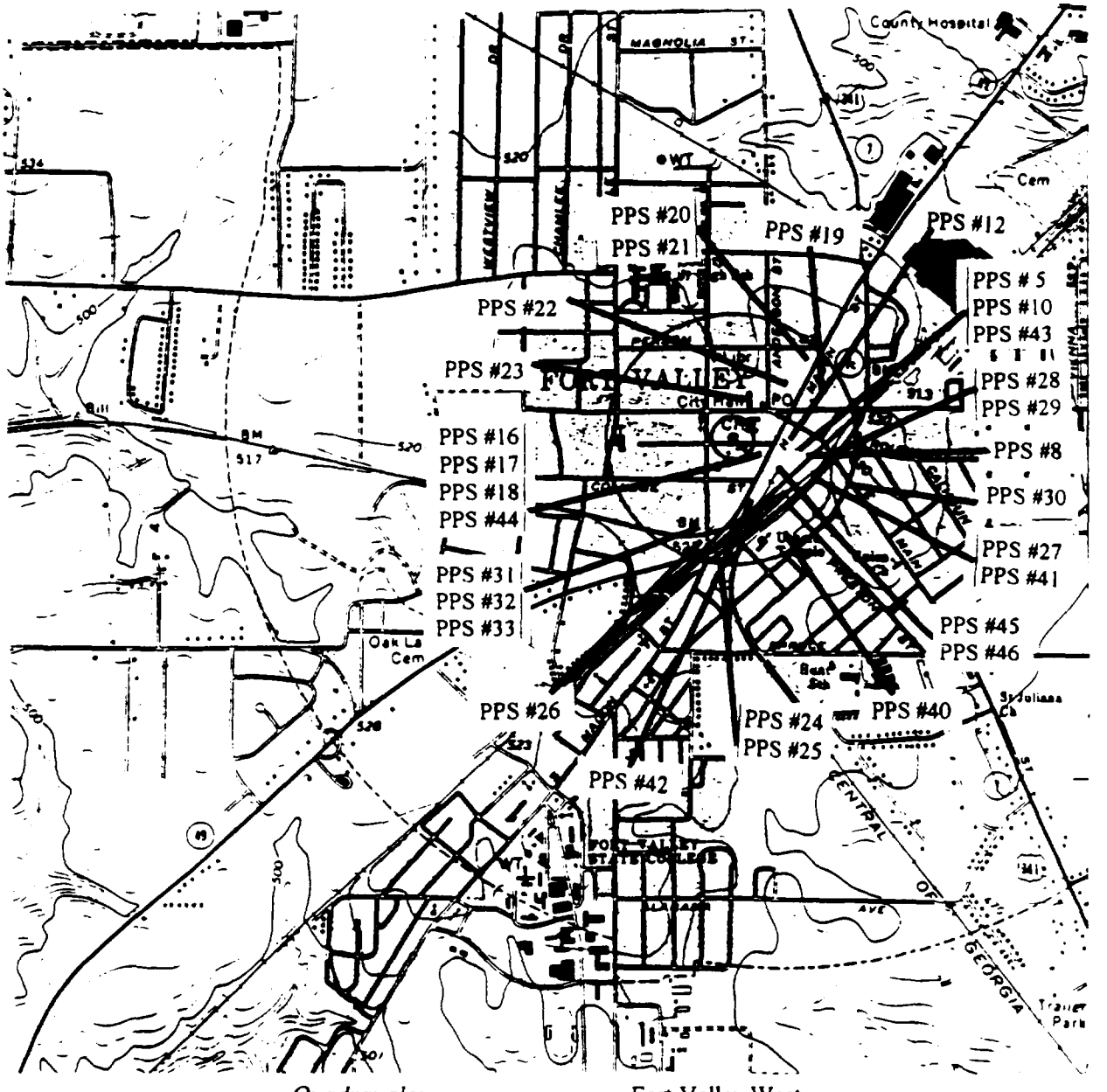
City of Fort Valley
Wells #3 and #4
Wellhead Protection Area




| | Well #3 | Well #4 |
|---|---|---|
| *Quadrangle:* | Fort Valley West | Fort Valley West |
| *Longitude:* | 83° 53' 50.6"W | 83° 53' 49.7"W |
| *Latitude:* | 32° 32' 24.3"N | 32° 32' 29.5"N |
| *Control Zone:* | 15 foot radius | 15 foot radius |
| *Inner- Management Zone:* | 250 foot radius | 250 foot radius |
| *Outer-Management Zone:* | 1100 foot radius | 1180 foot radius |

Potential Pollution Sources (PPS) not shown on this map are listed on pages 14 and 15

# City of Fort Valley
# Well #5
# Wellhead Protection Area




| | |
|---|---|
| *Quadrangle:* | Fort Valley West |
| *Longitude:* | 83° 53' 19.5"W |
| *Latitude:* | 32° 33' 10.6"N |
| *Control Zone:* | 15 foot radius |
| *Inner- Management Zone:* | 250 foot radius |
| *Outer-Management Zone:* | 1490 foot |

Potential Pollution Sources (PPS) of the IMZ are not shown on this map
Potential Pollution Sources (PPS) not shown on this map are listed on pages 16 and 17

# Radius Calculations for identifying the Outer-Management Zone

VOLUMETRIC FLOW EQUATION

$$R = \sqrt{\frac{QT}{\pi n H}}$$

R = WHPA RADIUS
Q = PUMPING RATE OF WELL
n = AQUIFER POROSITY
H = OPEN INTERVAL (NO GROUT) OR
LENGTH OF WELL SCREEN
T = TRAVEL TIME TO WELL

## Well #1

Q = 1000 gpm
n = 0.25
H = 402 feet
T = 5 years
R = 1,055 feet

## Well #2

Q = 1000 gpm
n = 0.25
H = 461 feet
T = 5 years
R = 985 feet

## Well #3

Q = 1000 gpm
n = 0.25
H = 372 feet
T = 5 years
R = 1,100 feet

## Well #4

Q = 1350 gpm
n = 0.25
H = 433 feet
T = 5 years
R = 1,180 feet

## Well #5

Q = 1500 gpm
n = 0.25
H = 303 feet
T = 5 years
R = 1,490 feet

# APPENDIX A
# INVENTORY OF POTENTIAL POLLUTION SOURCES

**AGRICULTURE**
A01 Agricultural Fields
A02 Agriculture Waste Impoundments
A03 Animal Burials
A04 Animal Feed Lots
A05 Commercial Animal Enclosures
A06 Fertilizer/Pesticide Storage
A07 Grain Storage Bins
A08 Irrigation Wells
A09 Pesticide Mixing Areas
A10 Other

**BUSINESS AND INDUSTRY**
B01 Asphalt Plant
B02 Auto Repair/Body Shop/Salvage Washes
B03 Auto/Truck/Boat/Equipment Dealers
B04 Business using Solvents/Paints
B05 Car Wash
B06 Chemical Production/Mixing/Storage
B07 Deicing Applications
B08 Electroplaters/Metal Finishers
B09 Fleet Service Facility
B10 Gasoline Station Service Bay
B11 Golf Courses/Nurseries
B12 Industrial Facilities
B13 Laundromats/Dry Cleaners
B14 Machine Shops
B15 Photo Processors
B16 Power Generating Facilities
B17 Printers
B18 Refineries
B19 Refinishing
B20 Salvage Operations
B21 Stockpiles
B22 Wood Chemical Treatment Facilities
B23 Other

**FUEL STORAGE**
F01 Above Ground Storage Tanks
F02 Fuel Storage Facility
F03 Oil/Gas Pipeline
F04 Underground Storage Tanks
F05 Other

**HAZARDOUS MATERIALS**
H01 Facilities Handling Hazardous Waste
H02 Hazardous Waste Disposal
H03 Hazardous Waste Management Units
H04 Radioactive Disposal and Storage
H05 Other

**INJECTION AND INFILTRATION**
I01 Abandoned Wells
I02 Domestic Wells
I03 Drainage Canals
I04 Holding Pond/Lagoon
I05 Infiltration Galleries
I06 Injection Wells
I07 Neighboring Polluted Wells
I08 Salt Water Intrusion/Upconing
I09 Sinkholes Modified/Natural
I10 Storm Water Runoff/Infiltration
I11 Swamps/Wetlands/Flood plain
I12 Urban Runoff
I13 Other

**KNOWN POLLUTION**
P01 Accident Spill Locations
P02 Hazardous Waste Sites
P03 Other

**LANDFILLS**
L01 Construction Waste Landfills
L02 Industrial Waste Landfills
L03 Municipal Solid Waste Landfills
L04 Others, Active or Abandoned

**MINING AND CONSTRUCTION**
M01 Borrow Pits
M02 Construction Excavations
M03 Detonation Sites
M04 Mining Operations
M05 Quarries/Underground Mines
M06 Other

**SEWAGE AND WATER TREATMENT**
S01 Domestic Septic Systems
S02 Lift Station
S03 Non-Domestic Septic Systems
S04 Sewage Treatment Plant
S05 Sewer Lines
S06 Treatment Lagoons/Ponds
S07 Waste Water Treatment Basin
S08 Water Treatment Facilities
S09 Other

**TRANSPORTATION**
T01 Access and Secondary Roads
T02 Airports
T03 Major Highways and Railroads
T04 Transportation Corridors
T05 Other

**WASTE DISPOSAL SITES**
W01 Abandoned Disposal Site
W02 Abandoned Drums
W03 Cesspools
W04 Drum Storage/Disposal/Recycling
W05 Dumps
W06 Garbage Transfer Stations
W07 Land Application Systems
W08 Open Pit Burning
W09 Recycling Facilities
W10 Sludge Application
W11 Sludge Producing Facility
W12 Waste Piles
W13 Other

**OTHER**
O01 Atmospheric Pollution Percolation
O02 Abandoned Cars/Vehicles
O03 Cemeteries
O04 Electrical Transformers
O05 Military Base/Depot
O06 Utility Corridors
O07 Utility Poles
O08 Vehicle Parking Areas
O09 Other

Rev 11/28/94 sjr

Georgia Department of Natural Resources
205 Butler Street, S.E., Floyd Towers East, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Harold F. Reheis, Director
Environmental Protection Division
(404) 656-4713

Reply To:
Georgia Geologic Survey
Room 400
19 Martin Luther King, Jr., Dr., S.W.
Atlanta, Georgia 30334

(404) 656-3214

**MEMORANDUM**

December 11, 1996

To: Jennifer Kaduck
Chief, Hazardous Waste Management Branch

Through: William H. McLemore
State Geologist

From: Roger Carter
Regulatory Program Manager

James S. Guentert
Geologist

Subject: Preliminary Identification of Potential Sources of PCE in Fort Valley Municipal Wells 1 and 2

The Fort Valley municipal water system is served by five water supply wells. Wells 1, 2 and 5 are located near the center of the downtown area, while Wells 3 and 4 are located in the southwest portion of town near Fort Valley State College. Locations of active (Wells 1-5) and abandoned wells and wellhead protection areas are indicated on Figure 1, which is taken from the Wellhead Protection Plan (WHPP), prepared by the Geologic Survey Branch. Locations of general potential pollution sources for Wells 1-5 are shown on page 26, 27, 28, and 29 and described in the WHPP text.

Perchloroethylene (PCE), also known as tetrachloroethylene, was first identified above detection limits in the Fort Valley municipal water supply Wells 1 and 2 on July 18, 1996. It is our understanding that Wells 1 and Well 2 have been sampled periodically for a group of target compounds which included PCE since October 1993. The PCE detections in Well 1 and Well 2 occurred approximately 3 months after PCE was detected in a deep monitoring well included in the Former Woolfolk Chemical Site groundwater monitoring network and after the laboratory detection limit was decreased from 5 ppb to 1 ppb. PCE concentrations have generally ranged from approximately 1 ppb to 2.5 ppb in Well 1. PCE has been identified at consistently higher concentrations in Well 2, ranging from 1 ppb to as high as 18 ppb, with an average of approximately 6.5 ppb. The most recent groundwater samples (10/8/96) analyzed at the EPD

laboratory from Well 1 and Well 2 contained 1.11 ppb and 5.40 ppb PCE, respectively. Although PCE has not been detected in the system entry point samples, Wells 1 and 2 have been shut down since the second week in August as a precautionary measure.

PCE is an organic solvent commonly used in the dry cleaning industry and as a metal and fabric degreaser. PCE has been manufactured in the United States since 1925, but trichloroethylene, another organic solvent, was more commonly used until the 1940's. PCE is a part of a group of potential environmental pollutants commonly referred to as DNAPLs (dense, nonaqueous phase liquids) which as the name implies are more dense than water and can be persistent, long-term sources of groundwater contamination. PCE has a density of 1.625 and has a relatively low solubility of 150 mg/l in water. PCE can naturally degrade in the subsurface to a series of other chlorinated organic compounds, including the end product, vinyl chloride, under the right site conditions. Potential sources of PCE in Ft. Valley will be discussed later in this memorandum.

The most detailed subsurface studies in the general vicinity of the Ft. Valley Wells 1 and 2 were conducted as part of the remedial investigations (RI) for the nearby Woolfolk Chemical NPL site. In descending stratigraphic order, the four main water bearing units identified were in the Paleocene Clayton Formation, the Upper Cretaceous Providence and Ripley Formations, the Upper Cretaceous Cusseta Sand and Blufftown Formation and the Upper Cretaceous Tuscaloosa Formation. The main water bearing lithostratigraphic units and the equivalent informal aquifer designations used in the Woolfolk site subsurface descriptions are illustrated in Figure 2.

A positive downward hydraulic head of 20-30 feet exists between the Providence and Tuscaloosa Aquifers. Previous hydrogeologic studies conducted at the Woolfolk site indicate that the groundwater in the Clayton Formation and the Tuscaloosa Formation flow to the southeast. The groundwater flow direction in the Providence/Ripley and Cusseta/Blufftown formation beneath the northern portion of the Woolfolk site is primarily to the north.

Well 1 and Well 2 were installed in 1954 and 1977 and are screened in the Tuscaloosa Formation at a total depth of 480 and 485 feet, respectively. Well 1 and Well 2 are constructed with 115 foot and 180 foot long, outer casings, respectively, that are grouted in place. The annular space between the borehole wall and the inner casing, however, is backfilled with gravel to the ground surface. This type of well construction is expected to allow some water to enter the well from the overlying Cusseta Sand/Blufftown Formation, which is exposed to the gravel backfill below the depths of the outer casings. Well 5 was installed in 1990 and is screened in the Tuscaloosa Formation. Unlike Wells 1 and 2, the outer casing extends to a depth of 320 feet and is grouted in the Tuscaloosa Formation, effectively sealing off the overlying water bearing units.

Well 1 and Well 2 pump at approximately 1000 gpm. Well 5 has a discharge rate of approximately 1500 gpm. According to city water department employee, Gary Dye, Well 1 and Well 2 generally operate according to demand from 7 AM to 7 PM. During this time they pump together, typically for a total of 6 to 7 hours. Well 5 operates according to demand from 7 PM to 7AM.

Potential Sources of PCE

Potential sources of PCE were identified and evaluated using the following methods:

- area reconnaissance and interviews of personnel at selected facilities
- discussions with Ft. Valley utility commission employees
- discussions with residents of Fort Valley
- review of reports and other information contained in EPD Hazardous Waste Management Branch files, EPD Geologic Survey Files and USEPA files
- review of Sanborn Fire Insurance maps from 1885, 1920 and 1930
- review of material provided by Claude Terry, City of Ft. Valley Technical Assistance Advisor

The majority of the facilities/sites listed below fall within the outer management zone of Wells 1 and 2 and were taken from the WHPP. All of the facilities have or may have handled PCE in significant quantities and are regarded as potential sources of the PCE identified in the City of Fort Valley's Well 1 and 2. These sites have tentatively been divided into two groups based on location relative to city Well 1 and 2, likely usage of PCE, and historic detections of PCE. Sites in Group A represent the more likely potential sources of PCE based on our preliminary evaluation. The site locations are shown on Figure 3 and cross-referenced by "PPS" designations to the WHPP, if applicable. It should be emphasized that a subsurface investigation would be needed to confirm the source or sources of PCE in the city wells.

Group A

| | |
|---|---|
| 1) Anthoine Machine Works (PPS 27) | machine shop |
| 2) former dry cleaner - alley west of Main St. (PPS 48) | former dry cleaning facility |
| 3) former dry cleaner - SW corner of Camelia Blvd. and W. Church St. (PPS 49) | former dry cleaning facility |
| 4) former dry cleaner - W. Church St. and Anderson Ave. (PPS 50) | former dry cleaning facility |
| 5) Fabra Care Cleaners (PPS 17) | dry cleaning facility |
| 6) Woolfolk Chemical (PPS 40) | NPL Site - pesticide formulation and repackaging |

Group B

| | |
|---|---|
| 1) Blue Bird Body/Wanderlodge (outside of wellhead protection area) | bus/RV manufacturing facility |
| 2) Eberhard Machine Works (PPS 41) | former machine shop |
| 3) Ft. Valley Machine Shop (outside of wellhead protection area) | machine shop |
| 4) Mark's Marine Engine Service (PPS 20) | small engine repair |
| 5) Norfolk Southern Railroad (PPS 46) | railroad |

| | |
|---|---|
| 6) Print Shop (PPS 45) | former printing facility |
| 7) Peach M.A.C (PPS 16) | automobile repair facility |
| 8) historic petroleum filling stations (PPS 51/52) | fuel supply and automobile repair (?) |
| 9) Splish Splash Car Wash (PPS 18/44) | possible former dry cleaning facility |

Note: PPS refers to Potential Pollution Source designation listed in the WHPP

**Group A**

*Anthoine Machine Shop*

The Anthoine Machine Shop has been in Ft. Valley since the late 1800's. The original facility is shown in a 1930 Sanborn Fire Insurance Map at the southeast corner of Preston and Railroad St. approximately 200 feet south west of its present location. Currently, organic solvents are used to wash parts at a small cleaning station. Spent solvents are currently removed and replaced by Safety Kleen, Inc. We do not know if spent solvents may have been released in the past.

A group of monitoring wells were installed as part of the Woolfolk Chemical Remedial Investigation, at a location on the Anthoine Machine Shop property approximately 50 feet southwest of the main building and 200 feet northwest of the Woolfolk site. PCE has been detected in two of the monitoring wells, MW-21 and MW-4T, installed in the Providence/Ripley aquifer, and the Tuscaloosa aquifer, respectively. PCE was not detected in the Clayton aquifer and there is no Cusseta/Blufftown aquifer monitoring well at this location. PCE was detected in MW-21 in 1996 at concentrations of 6.5 ppb and 5.6 ppb. PCE has been detected in groundwater samples from MW-4T consistently since March 1996 at concentrations ranging from 5.2 ppb to 9.9 ppb. Although the Anthoine Machine Shop is hydraulically downgradient of municipal Well 1 and Well 2, it is likely within the combined capture zone of Well 1, Well 2 and Well 5.

*Dry Cleaning Facilities*

The Fabre Care Cleaners dry cleaning facility is located approximately 500 feet from Well 1 and 600 feet from Well 2. According to the manager this dry cleaner has been operating since 1967 and does use PCE. PCE is presently reused after being filtered, with the spent filters being picked up by a recycling company. We do not know if waste dry cleaning fluids were released in the past.

A dry cleaner is shown on the 1920 and 1930 Sanborn Fire Insurance Map in the alley between the current McLean Water Plant and Main Street at a location approximately 50 feet northwest of Well 1. According to Mr. Kelvin Mason, the former owner of this property, the dry cleaner closed in the 1930's. Mr. Mason also indicated that an approximate 500 gallon underground storage tank was discovered at this location and removed in the mid 1970's. Mr. Mason stated that the tank contained a couple hundred gallons of liquid that he believed to be cleaning fluid. Mr. Mason mentioned that the liquid and the soils around the tank had a strong kerosene-like

odor. The former location of the tank is approximately 40 - 50 feet northwest of municipal Well 1.

Mr. Mason also identified two other former dry cleaning facilities in the area. The first location is a building on the southwest corner of Camelia Blvd. and W. Church St. currently occupied by a law office. According to Mr. Mason this dry cleaning facility operated in the 1960's and 1970's. The second facility, formerly owned by Mr. Mason's father-in-law, was located on the south side of W. Church St. at the intersection with Anderson Ave. This facility reportedly operated in the 1950's.

Assuming a regional flow to the south-southeast in the Tuscaloosa Aquifer, the Fabre Care Cleaners is hydraulically upgradient and within the groundwater capture zones of both Well 1 and Well 2. Potential releases from the three former dry cleaning facilities would be more likely to be captured by Well 1.

*Woolfolk Chemical*

Numerous investigations and evaluations of the Woolfolk Chemicals site have been completed over the last 10 to 12 years. Although reportedly there has been no specific reference to the usage of PCE at the Woolfolk Chemicals site, PCE has been detected in the groundwater at several locations in the northern portion of the facility and immediately offsite on the Anthoine Machine Shop property. Also, a 1971 letter from Woolfolk referencing a "drum washing operation" and "solvent storage tanks" on the Woolfolk site was provided by Mr. Claude Terry, the City of Ft Valley technical advisor.

PCE has been detected along the northern boundary of the Woolfolk site in the Cusseta Sand/Blufftown aquifer at monitoring wells MW-2R and MW-3R, most recently at concentrations of 15 ppb and 6.6 ppb, respectively. PCE was also detected in the Providence/Ripley aquifer at MW-2P at a concentration of 5 ppb. PCE has not been detected in the Tuscaloosa aquifer well, MW-2T, at the northern boundary of the site.

A study was conducted by Applied Engineering and Science (AES) in 1989 to evaluate if contaminants at the Woolfolk site could impact the municipal Wells 1 and 2. In order to determine if the capture zones of municipal Wells 1 and 2 in the Tuscaloosa Formation extended to the Woolfolk property, an aquifer test was conducted by turning off Well 1 and Well 2 for 4 5 days and then pumping the wells at full capacity for three days. During this period, drawdown measurements were recorded in a total of nine monitoring wells completed variously in the Clayton Formation, Providence Formation, Cusseta/Blufftown Formation and the Tuscaloosa Formation, on both the Anthoine Machine Shop and former Woolfolk property. The aquifer test data included in the AES report indicates that a maximum water level drawdown of approximately 1 foot was measured in a monitoring well completed in the Cusseta/Blufftown Formation near the northern boundary of the Woolfolk site. No significant drawdown was recorded in MW-18 and MW-2P completed in the Providence Formation and MW-2C completed in the Clayton Formation. Maximum drawdowns in the Tuscaloosa aquifer monitoring wells ranged from 6 to 8 feet.

There are two main problems with applying the 1989 AES study to evaluating whether releases at the Woolfolk site could impact the city Wells 1 and 2. The first is related to the municipal well capture zone analysis, and the second involves the groundwater flow direction in the Cusseta/Blufftown aquifer and the municipal well construction, as described below.

(1) AES calculated the "stagnation point" for Well 1 and Well 2, which represents the downgradient limit of the capture zone of a particular well. AES determined that the maximum capture zone in the Tuscaloosa Formation for Well 1 and Well 2, using an average discharge and average transmissivity, extended to roughly the northern boundary of the Anthoine Machine Shop property, but did not extend to any portion of the Woolfolk site.

The sum of the average discharge rates used by AES in 1989 for Well 1 and Well 2 is not consistent with the 1989 discharge data provided to the EPD by the Ft. Valley Utility Commission. AES utilized average daily discharge rates of 53,900 $ft^3$ and 42,400 $ft^3$ for Well 1 and Well 2, respectively. The combination of these two discharge rates is significantly lower than the 1989 average daily combined discharge of approximately 166,000 $ft^3$ as shown by the City of Ft. Valley data for Well 1 and Well 2. A discharge higher than reported by AES will increase the calculated distance to the stagnation point. The capture zones from Well 1 and Well 2 may well have extended beneath the Woolfolk site, at least, during the high water usage summer months.

Also, the 1989 analysis predated the installation of Well 5, and may no longer be representative of the capture zone(s) formed in the Tuscaloosa Formation with three municipal wells operating.

(2) The 1989 evaluation did not consider that contaminated groundwater in the Cusseta/Blufftown aquifer appears to flow to the north under a natural hydraulic gradient and would enter Well 1 and Well 2 through the gravel backfill open to the Cusseta/Blufftown aquifer.

While AES's conclusions may be correct, because of the above discrepancies, we do not believe AES adequately documented the validity of these conclusions. Furthermore, the AES conclusions seem to contradict our understanding of Upper Coastal Plain hydrogeology; we have reservations about the validity of the study conclusions.

## Group B

*Eberhard Machine Works*

The Eberhard Machine Works was located along the southside of Railroad Street, approximately 200 northwest of the Anthoine Machine shop, in an area now an open field. According to a long time resident of Ft. Valley, this machine shop closed approximately 50 years ago. Because this facility reportedly closed in the 1940's, it is less likely that PCE could have been used for an extended period of time.

*Ft. Valley Machine Shop*

Solvents likely are used to clean parts at this facility, however, specific usage of PCE was not confirmed. This site appears to be hydraulically upgradient of Well 1, Well 2 and Well 5. A distance of approximately 2300 and 2500 feet from Well 1 and Well 2, however, make this site a less likely source for the PCE detected in water samples from the municipal wells.

*Former Print Shop*

According to city officials this originally was an office building for the Ft. Valley Oil & Fertilizer Co., but was occupied by Middle Georgia Printing from January 1994 to March 1995. Although, PCE can be used in the printing industry, the brief and relatively recent occupancy by the printing company would suggest that it is a less likely potential source of the PCE detected in Well 1 and Well 2.

*Blue Bird Body/Wanderlodge*

This facility likely uses solvents, such as PCE, to clean parts. According to Jim Sliwinski of the EPD Hazardous Waste Management Branch, Blue Bird Body has recently reported that PCE has been detected in a groundwater sample from a monitoring well located downgradient of the "new" landfill. This landfill is located northeast of the actual Blue Bird Body Plant, almost one mile from municipal Well 1. Based on the information currently available, the Blue Bird Body Plant and the Wanderlodge Plant likely are not hydraulically upgradient of municipal Wells 1 and 2, considering groundwater flow in any of the four aquifers of interest. Also, these two facilities do not appear to lie within the capture zones that would develop in the Tuscaloosa aquifer from Well 1, Well 2 or Well 5.

*Norfolk Southern Railroad*

Norfolk Southern operates a railway and owns an old railroad depot within 500 feet and 1000 feet of Well 1 and Well 2, respectively. No evidence of solvents were noted at the railroad depot. Norfolk Southern has not yet responded to a written request sent to Mr. Joe Genette on October 16, 1996 asking for information on any chemicals stored, used or spilled within the wellhead protection areas of Well 1 and Well 2. Any releases at or in the vicinity of the depot would be within the capture zones of both Wells 1 and 2.

*Mark's Marine Engine Service*

Small quantities of degreasing agents likely are used at this engine repair facility. This site, however, is at least 1000 feet from Well 1 and 1500 feet from Well 2.

*Petroleum Filling Stations*

Three filling stations, which no longer exist, are shown on the 1930 Sanborn Fire Insurance map for Ft. Valley, within the current wellhead protection areas of Wells 1 and 2. These stations were

located at the southwest corner of Central and Camelia, the northwest corner of College and Camelia and the southwest corner of Railroad Street and Martin Luther King, Jr. Drive. The amount of PCE used would depend on the length of time these stations operated and whether they repaired and serviced automobiles in addition to supplying fuel.

*Peach M.A.C.*

According to the manager, the current automobile repair business has occupied the building for the last 14 years. Solvents are used at a parts cleaning station maintained by Safety Kleen. The solvent supplied by Safety Kleen is 85% mineral spirits and contains less than 0.5% PCE. The manager indicated that the building is approximately 35 years old and prior to being occupied by Peach M.A.C., the facility was a tire store and automobile repair facility.

*Splish Splash Car Wash*

According to Walter Lanter, the Ft. Valley Water Department Superintendent, a dry cleaning facility was located at the current Splish Splash Car Wash in the 1960's (perhaps prior to the opening of Fabre Care). Mr. Kelvin Mason, however, did not believe that a dry cleaning facility ever existed at this location.

**Other**

The most likely area for a release of PCE, which would account for the low levels detected in both municipal Well 1, municipal Well 2, as well as Tuscaloosa monitoring well MW-4T, is estimated to be between Well 1 and Well 2 and extend to the southeast to include the northern portion of the former Woolfolk Chemical site. This target area extends to the northwest to include the area on the north side of Camelia Boulevard, between College Street and Central Avenue. The vacant city block in the center of this area historically contained a cotton seed oil mill, cotton warehouse and a knitting mill. The majority of the buildings in this block were damaged and later removed following a tornado in 1975. There currently is no indication that PCE was used at either of these facilities. Nevertheless, this area would be an optimum hydrologic location for a release of PCE to impact both city Well 1 and 2 as well as monitoring MW-4T next to the Anthoine Machine Shop.

Summary

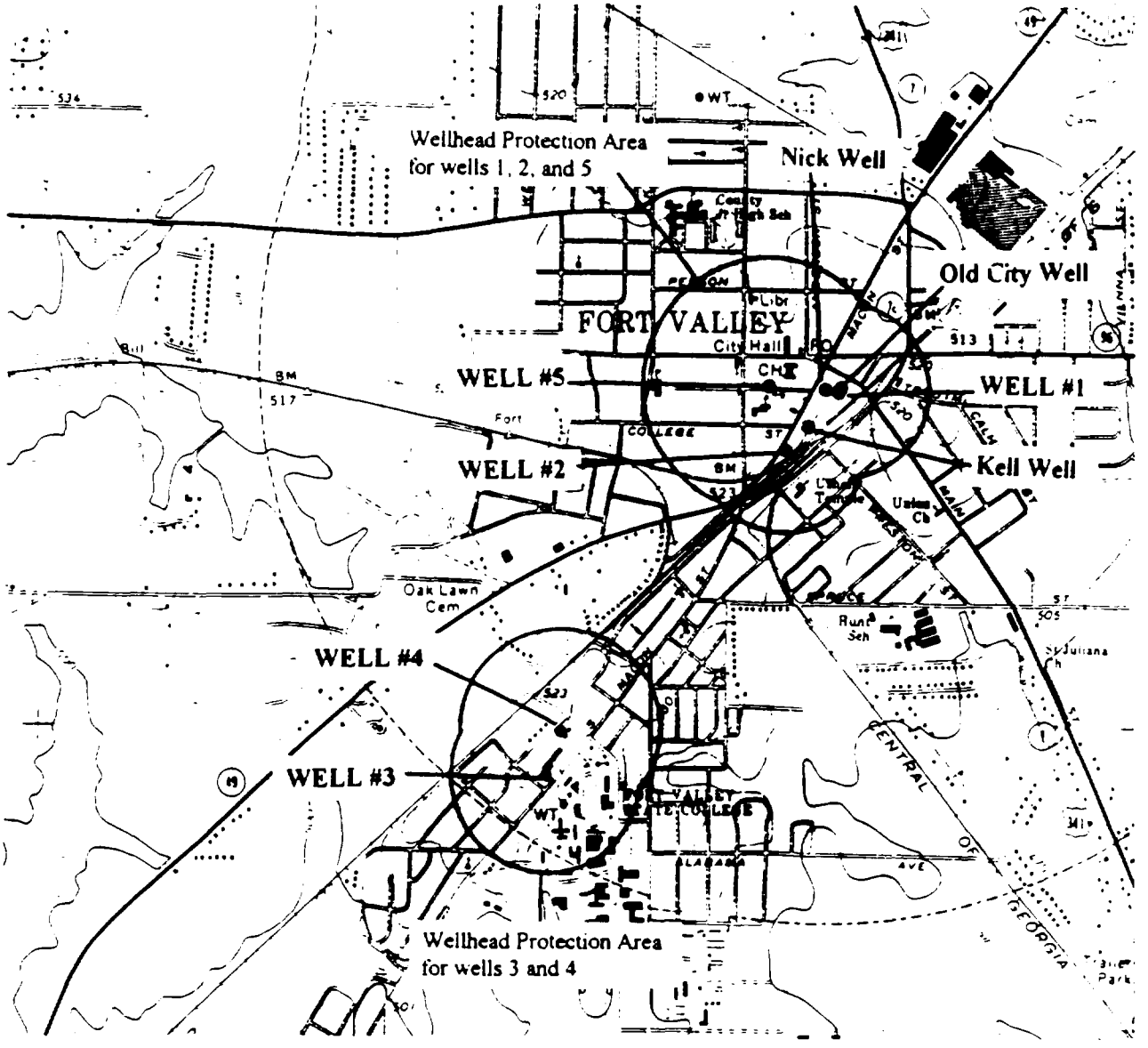
DNAPLs frequently are difficult to identify at a site. Unlike dissolved contaminant plumes, the movement of a DNAPL is controlled more by geologic than hydrologic conditions. Also, in terms of evaluating a particular site as the source of PCE, it is important to realize that the presence of only low levels of dissolved PCE in the groundwater does not necessarily mean that a significant "pool" or "pools" of non aqueous phase PCE is not present. Because of its relatively low solubility, large, high-concentration plumes of PCE would not be expected.

Evaluating the source of PCE in municipal Well 1 and 2 is difficult because of the complex geology and hydrology in this area, the number of potential sources in this area and the physical

properties of the contaminant. Also, it is possible that there are multiple sources of the observed PCE. Additional field investigation and analysis would be needed to further reduce the list of potential sources.

cc: File

City of Fort Valley
Wellhead Protection Areas




*Quadrangle:* Fort Valley West

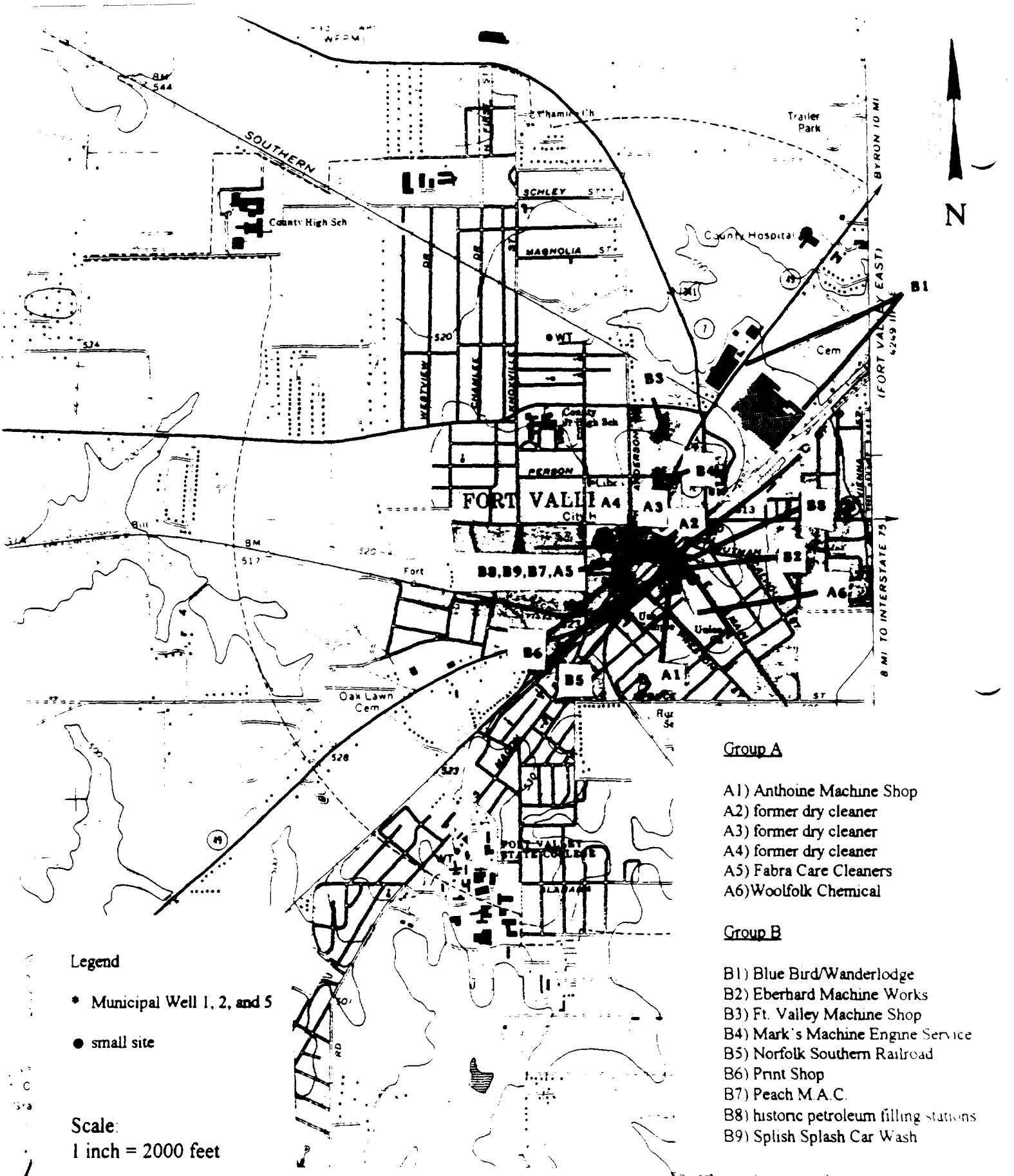
| | Well #1 | Well #2 | Well #3 | Well #4 | Well #5 |
|---|---|---|---|---|---|
| *Longitude:* | 83° 53' 10.3"W | 83° 53' 18.5"W | 83° 53' 50.6"W | 83° 53' 49.7"W | 83° 53' 19.5"W |
| *Latitude:* | 32° 33' 09.5"N | 32° 33' 02.3"N | 32° 32' 24.3"N | 32° 32' 29.5"N | 32° 33' 10.6"N |
| *CZ:* | 15 foot radius | 15 foot radius | 15 foot radius | 15 foot radius | 15 foot radius |
| *IMZ:* | 250 foot radius | 250 foot radius | 250 foot radius | 250 foot radius | 250 foot radius |
| *Omz:* | 1055 foot radius | 985 foot radius | 1100 foot radius | 1180 foot radius | 1490 foot radius |

| | Kell Well | Nick Well | Old City Well |
|---|---|---|---|
| *Longitude:* | 83° 53' 15.0"W | 83° 53' 12.3"W | 83° 53' 09.9"W |
| *Latitude:* | 32° 33' 05.5"N | 32° 33' 09.1"N | 32° 33' 09.6"N |
| *Status:* | abandoned | abandoned | abandoned |

**FIGURE 1**

| Lithostratigraphic Unit | Informal Designation in Woolfolk Site Investigation Reports |
|---|---|
| Clayton Formation | Surficial Aquifer |
| Providence and Ripley Formation | Upper Cretaceous Water Table Aquifer |
| Cusseta Sand and Blufftown Formation | Upper Cretaceous Confined Aquifer |
| Tuscaloosa Formation | Tuscaloosa Aquifer |

**FIGURE 2**




**Potential Sources of PCE**

**FIGURE 3**

Georgia Department of Natural Resources

205 Butler Street, S.E., East Floyd Tower, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Harold F. Reheis, Director
Environmental Protection Division
(404) 656-4713

Reply To:
Georgia Geologic Survey
Room 400
19 Martin Luther King Jr. Drive, S.W.
(404) 656-3214

**MEMORANDUM**

September 12, 1997

To: William H. McLemore
State Geologist

From: Roger Carter
Regulatory Program Manager

James S. Guentert
Geologist

Larry Papetti
Geologist

Subject: Fort Valley Phase I Investigation Plan

The purpose of the Phase I investigation is to: (1) gain a better understanding of the hydrogeology and geology, (2) evaluate the perched and water table aquifer groundwater quality in the vicinity of City to both identify potential PCE sources and to allow deeper drilling and (3) evaluate the depths at which contaminants are entering City Well 1 and City Well 2. The following three tasks have been designed to achieve these objectives.

**Task I - Monitoring Well Installation and Sampling**

Monitoring wells are proposed to be installed at five locations in Ft. Valley in the general vicinity of city wells 1,2, and 5 as shown on Figure 1. Monitoring wells will be installed in streets in Ft. Valley, because of insufficient right-of-way width along the streets, presence of above and below ground utilities, and inherent problems with obtaining permission and drilling on private property The City of Fort Valley has agreed that three monitoring well locations can be in Central Street and one in College Street. The fifth monitoring well location will be in State Highway 49, if permission is granted from the Georgia Department of Transportation.

Drilling Methods and Well Construction

Monitoring wells will be installed in the water table aquifer, which is anticipated to be

encountered at a depth of 100 - 120 feet. A shallow monitoring well will also be installed and sampled at each location, prior to drilling deeper, if a perched water bearing zone is encountered. A perched zone has been identified in this area above a kaolinite layer at a depth of 40 - 50 feet below ground level. A maximum of two monitoring wells at each of the five locations will be installed during this Phase I Investigation.

A hand auger will be used to dig to a depth of four feet at each location prior to drilling. The boreholes will be advanced using 4 1/4-inch I.D. hollow stem augers. Monitoring wells will be constructed with 2-inch diameter PVC casing and either 5-foot or 10-foot slotted screens. The annular space between the screen and borehole will be filled with an appropriately sized silica sand from the base of the borehole to approximately 2-feet above the top of the screen. A minimum 2-foot thick layer of bentonite hole plug will be placed above the sandpack. The remaining annular space will be filled with a cement-bentonite slurry grouted, pumped through a tremie pipe from the top of the hole plug layer to the ground surface.

An 8 1/4-inch diameter PVC surface casing will be installed, prior to drilling to the water table, at locations where a perched groundwater zone is encountered. The surface casing will be installed no closer than 5-feet from the perched groundwater monitoring well. Surface casings, where needed, will be installed by drilling 2-3 feet into the underlying kaolinite layer (approximately 50 feet) with 11 1/4-inch O.D hollow stem augers. The augers will then be removed, and the PVC casing installed in the open borehole. The annular space will be filled with a cement slurry grout from the base of the borehole to surface. The cement will be allowed to cure for at least 24 hours, before advancing 4 1/4-inch ID augers through the PVC surface casing to the water table. A monitoring well with a 10-foot screen will be installed in the upper portion of the water table as described above.

Monitoring wells will either be developed by hand bailing or through the use of a 2-inch diameter variable-flow submersible pump. Development water will be containerized in drums for later disposal.

Monitoring wells will be fitted with a locking, water-tight cap and completed with a flush-mounted, traffic-rated cover which is cemented in place.

Monitoring Well Surveying

Monitoring well locations and top-of-casing measuring points will be determined by a registered land surveyor. Top-of-casing measuring points will be determined to an accuracy of 0.01 feet and referenced to NGVD.

Soil Sampling and Analysis

Continuous soil cores will be collected using either a split core-barrel sampler, or split-spoon sampler. Grab samples will be collected from the cores at 2.5-foot intervals for field PID screening and/or laboratory analyses. One half of each soil grab sample will immediately be

placed in a ziplock bag, and screened for organic vapors in the field using a PID. The second half of each soil grab sample will immediately be placed in a soil jar and kept on ice for possible laboratory analysis. Soil samples for which PID readings above background values are obtained will be sent for laboratory analysis by EPA Method 502.2 (which includes PCE as a parameter). Otherwise, the deepest unsaturated soil sample will be sent for laboratory analysis. Additionally, a soil sample from the bottom of each boring (whether saturated or unsaturated) will be collected and analyzed by EPA Method 8260

Augers, drill rods, and soil sampling devices will be steam-decontaminated prior to drilling each well. Prior to collection of each soil sample within a boring, the sampling device will be scrubbed with a liquinox-water solution, rinsed with tap water, sprayed with isopropanol, and given a final rinse with distilled water.

At least one equipment rinseate blank will be collected per boring for soil sampling equipment. The equipment rinseate blank will be collected by pouring distilled water into the sample bottle through the decontaminated sampling device to be used for the first sample in each boring. The equipment rinseate blank will be analyzed by EPA Method 502.2.

Groundwater Sampling and Analysis

A new disposable teflon bailer will be used for each well. New disposable, powder-free latex gloves will be worn during sampling activities.

At least 3 well volumes of water will be purged from each monitoring well prior to sampling. During purging, pH, conductivity, and temperature will be monitored. If pH, temperature, and conductivity have not stabilized by the third well volume, purging will continue until the measurements have stabilized, or 5 well volumes have been removed.

Groundwater samples will be collected, and analyzed for volatile organic compounds (VOCs) by EPA Method 502.2 (the standard drinking-water analysis for VOCs). Immediately after collection, groundwater samples will be placed on ice. Quality assurance samples will include one field duplicate (split of one groundwater sample), one bailer rinseate blank (obtained by pouring distilled water through a clean bailer prior to use in a well), and one travel blank (sample of distilled water prepared by the laboratory to accompany sample bottles during transport) per sampling event. During the sampling event, monitoring wells with previously-confirmed contamination, or with suspected contamination (odor, etc.) will be sampled subsequently to wells expected to be clean.

Development water from all wells not previously shown to be clean will be contained in D.O.T. compliant, properly labeled drums, and stored on fenced City of Ft. Valley property until analytical results are obtained. Contaminated development water will then either be disposed of by permitted, licensed contractors or discharged to the city sewer system.

Drill Cuttings and Fluids

Investigation derived soils and water will be handled in general accordance with the attached Investigation Derived Waste (IDW) Management Plan.

Drill cuttings and drilling mud will be staged at each location on plastic, awaiting transportation to a centrally located, lined roll-off box. The roll-off box will be kept in the fenced and locked municipal garage compound and will be covered with a plastic tarp. Liquids which may accumulate after the drilling mud has settled will be pumped off periodically into 55-gallon, steel drums. If determined to be non-hazardous the roll-off box will be transported to a Subtitle D landfill for disposal.

Sampling purge water and development water will be collected from each well in a separate 55-gallon, steel drum. Depending on the analytical results and levels of contaminants the water may be discharged to the City of Ft. Valley sewer system or disposed of at a licensed and permitted waste management facility.

**Task II - Gamma Ray Logging**

City well 1 and 2 and the deepest monitoring well installed by EPD at each location will be gamma ray logged using the Georgia Geologic Survey's logging van and equipment. Logging the city wells is dependant on the Fort Valley Utility Commission contracting the removal of the pumps and associated pipe and any residual lubricant oil floating on the water surface.

**Task III - Screened Interval Sampling**

Discreet groundwater samples will be collected from each screened interval in City Wells 1 and 2 The success of this task will be dependant on how accurately the screened intervals in each well can be identified. Historic downhole television logs in combination with driller's logs from City Well 1 and 2 will be used to identify the screened intervals. It is anticipated that 3-5 samples will be collected from each well.

Groundwater samples will be collected using a low-flow sampling pump, positioned in the middle of each screened interval. More than one sample may be collected in screened intervals greater than 20 feet long. The groundwater pH, temperature and conductivity will be carefully monitored to assist in collecting a groundwater sample representative of the formation quality at that depth. with minimal input form water stored within the gravel pack or stagnant water within the casing The pump that will be utilized is a nitrogen-operated, bladder pump capable of collecting groundwater samples from as deep as 1000 feet below ground level. If successful, this technique should give some indication of the depths where contaminated groundwater is entering the city wells. An added benefit of low-flow sampling is that the volume of purge water is minimized. Purge water from each interval will be containerized separately and disposed of based on the laboratory analytical results.

Groundwater samples collected from the screened intervals will be analyzed for volatile organic compounds, total metals, pesticides and herbicides.

# ATTACHMENT

## CONSIDERATIONS FOR MANAGING INVESTIGATION DERIVED WASTES

This plan addresses management of investigation derived waste (IDW) associated with investigative activities to be performed by the GGS Field Team. Wastes of concern include drill cuttings and mud, development/purge water from monitoring wells, contaminated personnel protective equipment (gloves, etc), sampling equipment (bailers, etc), drilling equipment (augers, etc), and soil and groundwater samples themselves.

In Particular, the following three EPA documents were reviewed in plan preparation:

- a quick reference Fact Sheet entitled *Guide to Management of Investigation-Derived Wastes* (January 1992), Publication 9345.3-03FS;
- a Region IV internal guidance memorandum TSC-92-02 entitled *Management of Contaminated Media* (December 28, 1992); and
- Section 5.15 (entitled *Investigation Derived Waste*) of the *Standard Operating Procedures-Quality Assurance Manual* (May 1996).

The following USTMP documents were also reviewed:

- *Petroleum Contaminated soil Disposal/Treatment--Guidance Document* (8/95, GUST-39); and
- *So You Want To Close An UST?--Petroleum Releases* (8/95, GUST-9).

**IDW Potentially Contaminated by a Listed or Characteristic Hazardous Waste, or by Petroleum from a Non-Exempted Source**

The *Decision Matrix for Managing Contaminated Media*, which is included in the December 28 1992 EPA Region IV guidance memorandum, should be applied to IDWs which are potentially hazardous or non-exempted wastes. Accordingly, if an IDW is not suspected of being contaminated, or has been shown to be non-contaminated, then best management practices apply. For instance, non-contaminated or decontaminated soil, drilling mud, or development/purge water might be disposed of on the ground in the vicinity of the boring or well from which it was derived. Non-contaminated or decontaminated personnel protective equipment and sampling equipment should be disposed of in an ordinary household (Subtitle D) garbage recepticle such as a city dumpster.

IDW suspected or known to be contaminated by hazardous or non-exempted petroleum wastes should be managed as follows:

Drill cuttings and mud, decontamination fluids, and well development/purge water should be contained in drums or appropriate containers until analytical results are obtained. Containers and drums should be segregated by well/boring location in order to minimize the volume of contaminated media. The drums or containers should be temporarily labelled with drum markers identifying their contents, generator name and address, and date. If soil or groundwater analytical results indicate that the contained IDW might be contaminated by a hazardous or non-exempted petroleum waste, then a TCLP test should be run on the drum/container contents to determine if it is a characteristic waste.

If TCLP analysis indicates that the drum/container contents are non-hazardous and non-contaminated, then the IDW should be disposed of by spreading onsite as described in the first paragraph of this section. If the contents pass the TCLP test (are non-hazardous), but are still contaminated above detection limits, then the drum/container should be labelled with an EPA/DOT compliant non-hazardous waste sticker, and the contents either disposed of in a RCRA Subtitle D Municipal Solid Waste Landfill, soil treatment (recovered materials) facility, or other licensed facility; or managed according to best management practices. Best management practices for contaminated, non-hazardous soil might consist of decontaminating soil onsite (ie spreading soil out on plastic sheeting, and allowing it to volatilize in the sun) and subsequent onsite disposal. If the drum/container contents fail the TCLP test, they should be labelled with an EPA/DOT-compliant hazardous waste sticker, and properly manifested and disposed of as a hazardous waste by a licensed waste hauler.

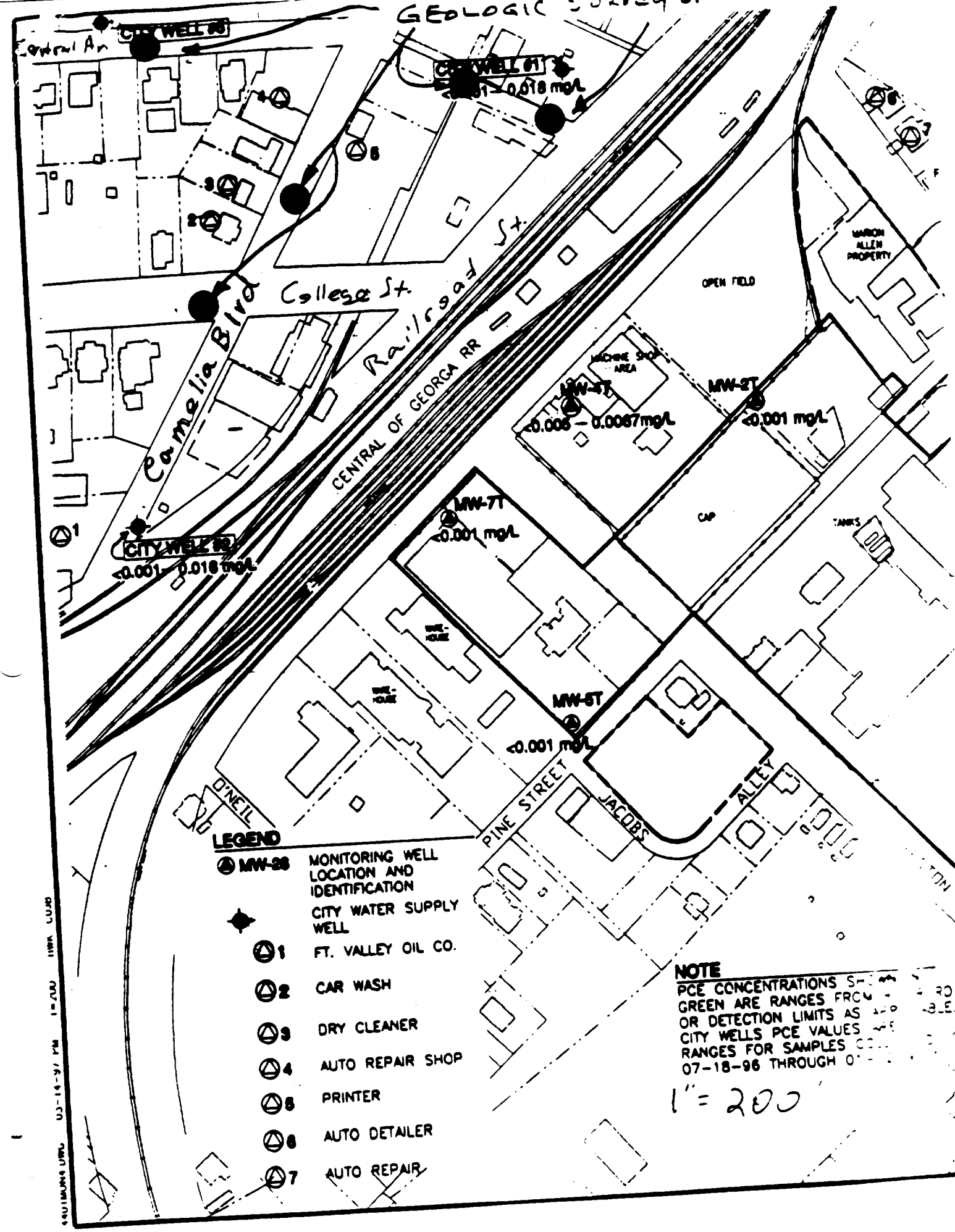
An exclusion is provided in *40 CFR Section 261.4(d)* for soil and groundwater samples in the process of being analyzed, or being transported for analysis. After analysis, the samples, if hazardous, will be properly disposed of by the EPD laboratories.

**IDW Potentially Contaminated by Petroleum from a Regulated UST Source**

We recommend that IDWs suspected of being contaminated by petroleum from a regulated UST source be managed according to GUST guidelines. Sampling equipment and PPE should be decontaminated onsite, and disposed of in a Subtitle D facility. Groundwater suspected of being contaminated should be drummed/containerized and labelled as described in the previous section. Soil suspected of being contaminated should be stockpiled on an inpermeable surface (ie concrete or asphalt), and enveloped in plastic sheeting unless it contains free product, in which case it should be drummed. If soil and/or groundwater analytical results indicate that the drummed/containerized/stockpiled IDW is likely to be contaminated, then it should be sampled for the suspected petroleum compounds. If sampling indicates that the IDW is clean, then it can be disposed of onsite as described in the previous section. If the soil is determined to be contaminated with petroleum from a regulated UST source, then it should be disposed of in a Municipal Solid Waste Landfill, or soil treatment (recovered materials) facility according to the GUST guidance document: *Petroleum Contaminated Soil Disposal/Treatment*.
Drummed/contained groundwater which is contaminated by petroleum from a regulated UST

source but is non-hazardous, should be labelled as non-hazardous with an appropriate sticker, and disposed of by a licensed waste disposal facility.

GEOLOGIC SURVEY DRILLING LOCATION



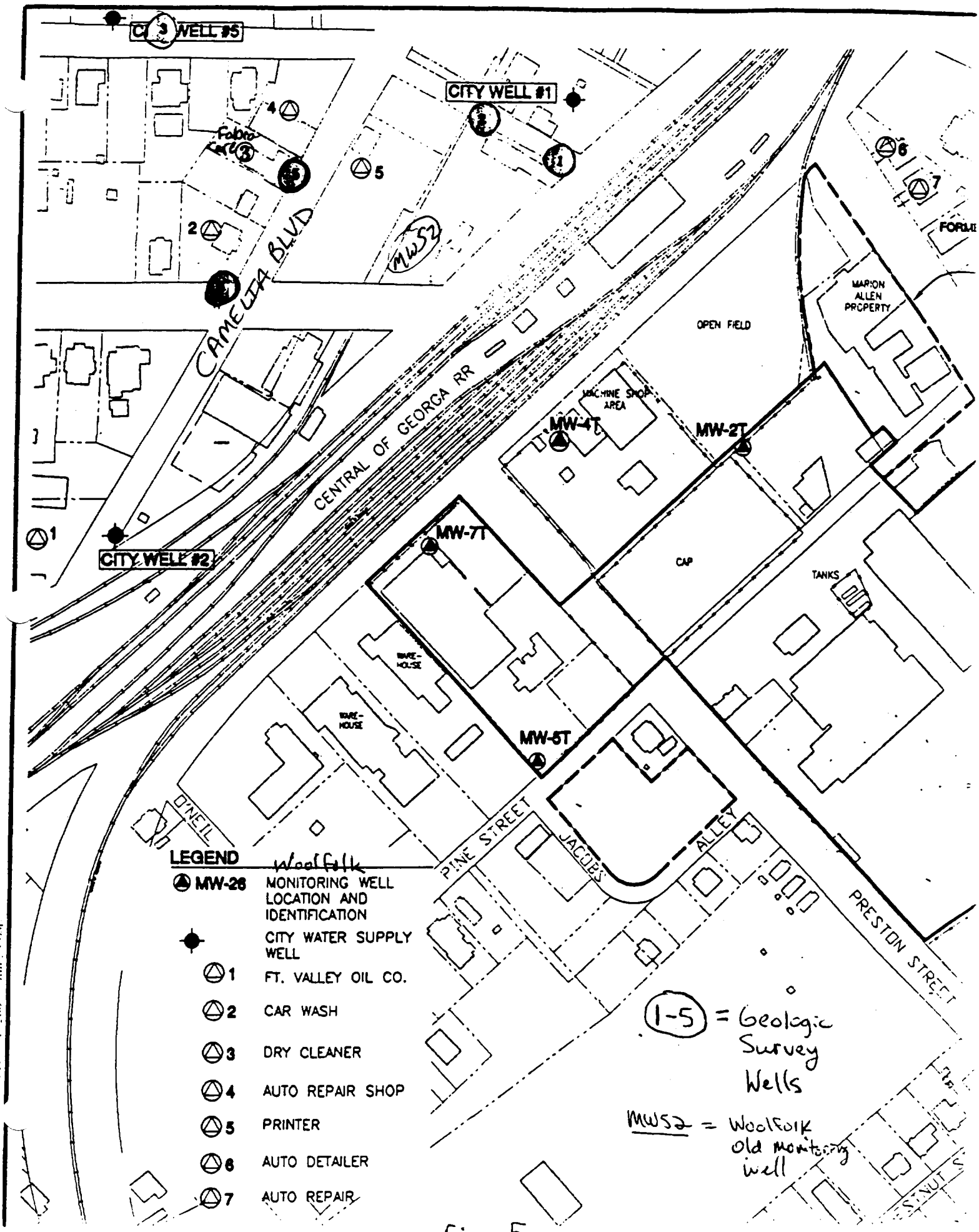

CITY WELL #5
CITY WELL #1
CITY WELL #2
CAMELLIA BLVD
CENTRAL OF GEORGA RR
MW52
Fabric
OPEN FIELD
MARION ALLEN PROPERTY
MACHINE SHOP AREA
MW-4T
MW-2T
MW-7T
MW-5T
CAP
TANKS
WARE-HOUSE
WARE-HOUSE
O'NEIL
PINE STREET
JACOBS
ALLEY
PRESTON STREET
LEGEND
Woolfolk
MW-26 MONITORING WELL LOCATION AND IDENTIFICATION
CITY WATER SUPPLY WELL
1 FT. VALLEY OIL CO.
2 CAR WASH
3 DRY CLEANER
4 AUTO REPAIR SHOP
5 PRINTER
6 AUTO DETAILER
7 AUTO REPAIR
1-5 = Geologic Survey Wells
MW52 = Woolfolk old monitoring well

Figure 5

Georgia Department of Natural Resources
205 Butler Street, S.E., Suite 1154, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Harold F. Reheis, Director
Environmental Protection Division
404/656-2833 404/656-7802

# MEMORANDUM

**TO:** Alan Yarbrough

**FROM:** Terri Crosby

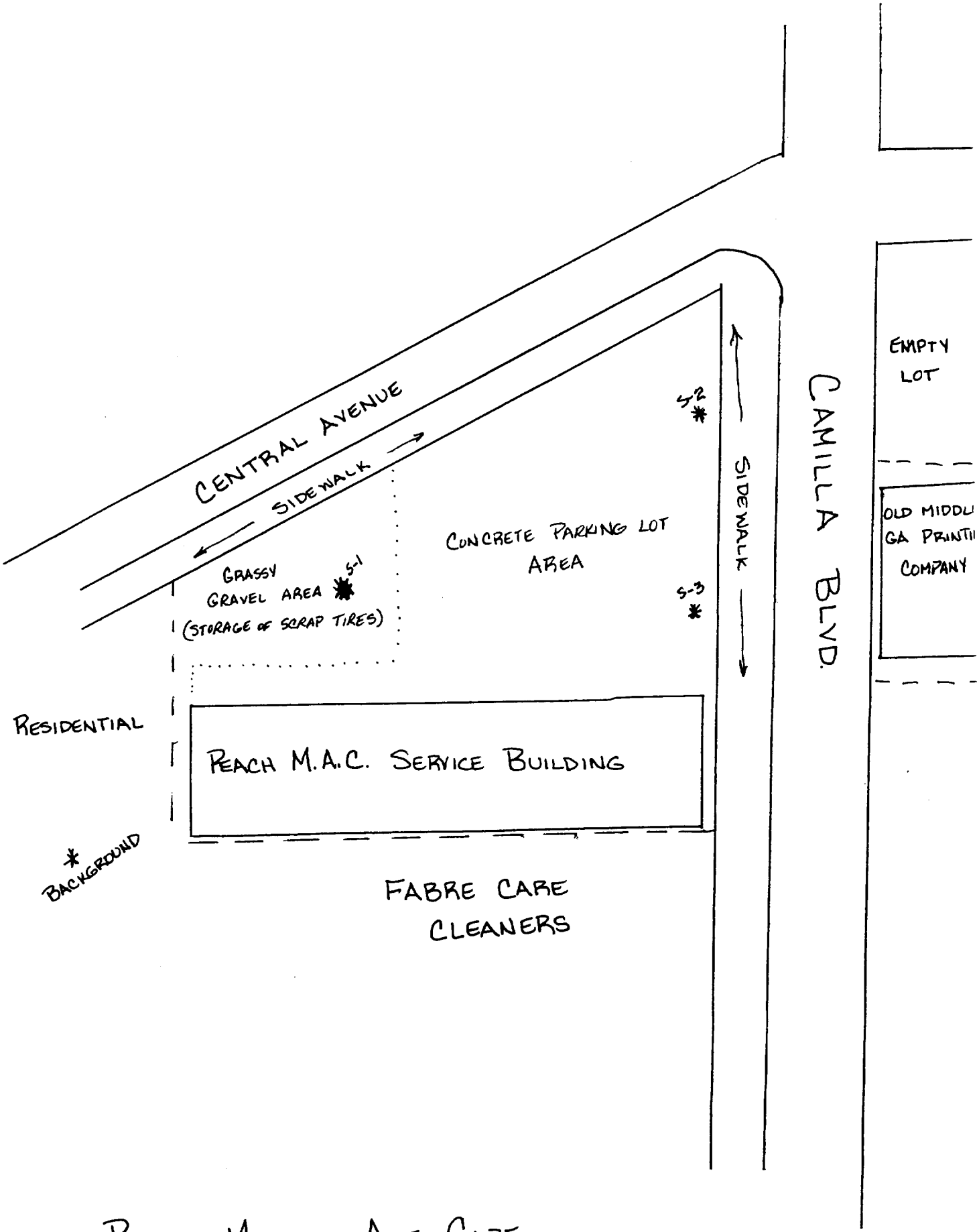
**DATE:** June 1, 1998

**SUBJECT:** Peach Maximum Auto Care

---

Please find attached the sampling plan for the above SI. The pathway of concern is the ground water pathway. PCE has been detected in Fort Valley supply wells 1 and 2. The site is within the outer-management zone of the wellhead protection area for both municipal wells 1 and 2. The samples will be analyzed for PCE. The soil samples will help determine the source of contamination.

Please call me at 657-8643 with your comments.




PEACH MAXIMUM AUTO CARE

FT. VALLEY, GA

NOT TO SCALE

**GEORGIA ENVIRONMENTAL PROTECTION DIVISION**
**HAZARDOUS WASTE MANAGEMENT BRANCH**

**CHAIN OF CUSTODY**

**FACILITY:** Peach MAC **LOCATION:** Fort Valley

| SAMPLE # | HWMB LOG # | LAB # | DESCRIPTION | COLLECTED BY (NAME) | DATE | TIME |
|---|---|---|---|---|---|---|
| 1A | 7740 | | Soil Sample, Depth 0-4' | Ken Grall | 7/20/98 | 2:00 |
| 1B | 7741 | | , Depth 4-8' | | | 2:30 |
| 2A | 7742 | | , Depth 0-4' | | | 3:00 |
| 2B | 7743 | | , Depth 4-8' | | | 3:30 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**TRANSFER RECORD**

| TRANSFERRED BY (NAME) | TO (NAME) (IF FINAL: LAB NAME) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (NAME) | DATE |
|---|---|---|---|---|---|---|
| Ken Grall | Inorganic Lab | 7/21/98 | 9:30 | Hand Delivery | Robert Rice | 7/21/98 |
| | | | | | | |
| | | | | | | |

**ANALYSIS REQUESTED:** VOCs (PCE)

# HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
## REQUEST FOR LABORATORY ANALYSIS

P4

**Facility Name/Location:** Peach MAC / Fort Valley

**Sample Collected By/Phone:** Ken Grall 657-8683

**Collection Date:** 7/20/98

**Date Submitted To Lab:** 7/21/98 **LAB No.** _____

**HWMB LOG NUMBER:** 7740 (Sample #1A)

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** Routine X **Other (specify):** _____

**Sample Description** (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | X | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

**Concentration of Organics Requested (estimated):** High ___ Low X **Other (e.g., rinse blank - specify)** _____

Georgia Dept. of Natural Resources

**Describe Sample Including Source And Known Properties (e.g., p**

Soil sample, depth 0-4', Auto Repair Facility

AC19067 Due date: 08/17/98
Date submitted: 07/21/98
source_I: ADHOC Peach MAC Fort Valley HW7740
Sample collector: KEN GRALL

**Applicable Hazardous Waste Codes** (if known) _____

**Special Precautions:** _____

## ANALYSIS REQL

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.:

### 1. TOTAL ORGANICS

| | | | |
|---|---|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ | | |
| Volatiles | X | 1 | 4 OZ. JARS |
| Pesticides | ___ | ___ | 8 OZ. JARS |
| Herbicides | ___ | ___ | 16 OZ. JARS |
| Organophosphorous Pesticides | ___ | 3 Encore samples | |
| PCB | ___ | | |
| BETX | ___ | | |
| Total Petroleum Hydrocarbon | ___ | | |

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

**Organics Special Request:** Looking for the presence of PCE.

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

**Additional Specific Organics For TCLP:** _____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | |

**ADDITIONAL ANALYSIS REQUESTED** (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | | Date: | | Received By (EPD Lab): | Robert Rice |
| Approved By (HWMB): | FMG | Date: | 7/21/98 | Date (EPD Lab): | 7/21/98 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | KEN GRALL | **Sample ID :** | AC19067 |
| **Date Received:** | 07/21/98 | **Date Collected:** | 07/20/98 |
| **Time Received:** | 09:44 | **Time Collected:** | 14:00 |
| **Reporting Date:** | 07/24/98 | **DNR Lab Reference:** | HW7740 |
| **Sample Site:** | Peach MAC Fort Valley HW7740 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | ,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estimated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1 3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | ,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 48.0 | | ug/kg | SA1 | 07/21/98 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | lorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 47.9 | | ug/kg | SA1 | 07/21/98 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |

**Sample ID : AC19067**



AMETER CODE: EPA
l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 51.6 | | ug/kg | SA1 | 07/21/98 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SA1 | 07/21/98 |

**Sample comments :**

*End of Report*



PARAMETER CODE: EPA
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**Laboratory Contacts:**

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|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
## REQUEST FOR LABORATORY ANALYSIS

RLP

**Facility Name/Location:** Peach MAC / Fort Valley

**Sample Collected By/Phone:** Ken Grall 657-8683

**Collection Date:** 7/20/98

**Date Submitted To Lab:** 7/21/98 **LAB No.** _____

**HWMB LOG NUMBER:** 7741 (Sample #1B)

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** Routine X **Other (specify):** _____

**Sample Description** (check one)

Waste ___ Soil/Sediment X Sludge ___

Ground Water ___ Surface Water ___ Drinking Water Well ___

**Concentration of Organics Requested (estimated):** High ___ Low ___ **Other (e.g., rinse blank - specify)** _____

Georgia Dept. of Natural Resources

**Describe Sample Including Sources And Known Properties** (e.g., pH.

Soil Sample, depth 4-8', Auto Repair Facili

AC19069 Due date: 08/17/98
Date submitted: 07/21/98
source_1: ADHOC Peach MAC Fort Valley
Sample collector: KEN GRALL

**Applicable Hazardous Waste Codes** (if known) _____

**Special Precautions:** _____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.

### 1. TOTAL ORGANICS

Semi-Volatiles (Acid & Base/Neutral) ___

Volatiles X

Pesticides ___

Herbicides ___

Organophosphorous Pesticides ___

PCB ___

BETX ___

Total Petroleum Hydrocarbon ___

1 4 OZ. JARS
___ 8 OZ. JARS
___ 16 OZ. JARS
3 Encore Samples

**Organics Special Request:** Looking for the presence of PCE.

### 2. TOTAL METALS

ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ___

Mercury ___

Metals Special Request: ___

### 3. TCLP ORGANICS

Volatiles ___ Pesticides ___

Semi-Volatiles (Acid & Base/Neutral) ___ Herbicides ___

Additional Specific Organics For TCLP: _____

### 4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ___ Additional Metals For TCLP: _____

Mercury ___

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

Reviewed By (HWMB): _____ Date: _____ Received By (EPD Lab): Robert Price

Approved By (HWMB): JMG Date: 7/21/98 Date (EPD Lab): 7/21/98

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | KEN GRALL | **Sample ID :** | AC19069 |
| **Date Received:** | 07/21/98 | **Date Collected:** | 07/20/98 |
| **Time Received:** | 09:44 | **Time Collected:** | 14:30 |
| **Reporting Date:** | 07/24/98 | **DNR Lab Reference:** | HW7741 |
| **Sample Site:** | Peach MAC Fort Valley HW7741 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | ,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |



:AMETER CODE: EPA
ı : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | ,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 48.0 | | ug/kg | SA1 | 07/21/98 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | lorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 43.9 | | ug/kg | SA1 | 07/21/98 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |

**Sample ID : AC19069**



:AMETER CODE: EPA
g/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | aphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 51.5 | | ug/kg | SA1 | 07/21/98 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SA1 | 07/21/98 |

**Sample comments :**

*End of Report*



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
REQUEST FOR LABORATORY ANALYSIS

RU

Facility Name/Location: Peach MAC / Fort Valley

Sample Collected By/Phone: Ken Grall 657-8683

Collection Date: 7/20/98

Date Submitted To Lab: 7/21/98 LAB No. _____

HWMB LOG NUMBER: 7742 (Sample # 2A)

*(File a separate Request Sheet for each sample point)*

Analysis Needed By: Routine X Other (specify): _____

Sample Description (check one)

Waste ___ Soil/Sediment X Sludge ___

Ground Water ___ Surface Water ___ Drinking Water Well ___

Concentration of Organics Requested (estimated): High ___ Low ___ Other (e.g., rinse blank - specify) _____

Georgia Dept. of Natural Resources

Describe Sample Including Source And Known Properties (e.

Soil Sample, depth 0-4', Auto Repair

AC19072 Due date: 08/17/98
Date submitted: 07/21/98
source_I: ADHOC Peach MAC Fort Valley HW7742
Sample collector: KEN GRALL

Applicable Hazardous Waste Codes (if known) _____

Special Precautions: _____

ANALYSIS R.

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

## 1. TOTAL ORGANICS

Semi-Volatiles (Acid & Base/Neutral) ___

Volatiles X

Pesticides ___

Herbicides ___

Organophosphorous Pesticides ___

PCB ___

BETX ___

Total Petroleum Hydrocarbon ___

1 4 OZ. JARS

___ 8 OZ. JARS

___ 16 OZ. JARS

3 Encore Samples

Organics Special Request: Looking for the presence of PCE.

## 2. TOTAL METALS

ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ___

Mercury ___

Metals Special Request: ___

## 3. TCLP ORGANICS

Volatiles ___ Pesticides ___

Semi-Volatiles (Acid & Base/Neutral) ___ Herbicides ___

Additional Specific Organics For TCLP: _____

## 4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ___ Additional Metals For TCLP: _____

Mercury ___

## 5. ADDITIONAL ANALYSIS REQUESTED (see list on back):

Reviewed By (HWMB): _____ Date: _____ Received By (EPD Lab): Robert Price

Approved By (HWMB): PMG Date: 7/21/98 Date (EPD Lab): 7/21/98

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | KEN GRALL | **Sample ID :** | AC19072 |
| **Date Received:** | 07/21/98 | **Date Collected:** | 07/20/98 |
| **Time Received:** | 09:44 | **Time Collected:** | 15:00 |
| **Reporting Date:** | 07/24/98 | **DNR Lab Reference:** | HW7742 |
| **Sample Site:** | Peach MAC Fort Valley HW7742 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | ,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 47.9 | | ug/kg | SA1 | 07/21/98 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | lorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 47.1 | | ug/kg | SA1 | 07/21/98 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |

**Sample ID : AC19072**



:AMETER CODE: EPA
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mg/l : milligrams/liter
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | -Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | aphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Trace | | ug/kg | SA1 | 07/21/98 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 52.2 | | ug/kg | SA1 | 07/21/98 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SA1 | 07/21/98 |

**Sample comments :**

*End of Report*



:AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)
## REQUEST FOR LABORATORY ANALYSIS

RLP

**Facility Name/Location:** Peach MAC / Fort Valley

**Sample Collected By/Phone:** Ken Grall 657-8683

**Collection Date:** 7/20/98

**Date Submitted To Lab:** 7/21/98 **LAB No.** _____

**HWMB LOG NUMBER:** 7743 (Sample # 2B)

*(File a separate Request Sheet for each sample point)*

**Analysis Needed By:** Routine X **Other (specify):** _____

**Sample Description** (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ___ | Soil/Sediment | X | Sludge | ___ |
| Ground Water | ___ | Surface Water | ___ | Drinking Water Well | ___ |

**Concentration of Organics Requested (estimated):** High ___ Low ___ **Other (e.g., rinse blank - specify)** _____

**Describe Sample Including Source And Known Properties** (e.g., pH,

Soil Sample, depth 4-8', Auto Repair Facility

**Applicable Hazardous Waste Codes** (if known) _____

**Special Precautions:** _____

AC19074 Due date: 08/17/98
Date submitted: 07/21/98
source_I: ADHOC Peach MAC Fort Valley HW7743
Sample collector: KEN GRALL

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.)

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ___ |
| Volatiles | X |
| Pesticides | ___ |
| Herbicides | ___ |
| Organophosphorous Pesticides | ___ |
| PCB | ___ |
| BETX | ___ |
| Total Petroleum Hydrocarbon | ___ |

1 4 OZ. JARS
___ 8 OZ. JARS
___ 16 OZ. JARS

3 Encore Samples

**Organics Special Request:** Looking for the presence of PCE.

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ |
| Mercury | ___ |
| Metals Special Request: | ___ |

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ___ | Pesticides | ___ |
| Semi-Volatiles (Acid & Base/Neutral) | ___ | Herbicides | ___ |

**Additional Specific Organics For TCLP:** _____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ___ | Additional Metals For TCLP: | ___ |
| Mercury | ___ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): _____

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | | Date: | | Received By (EPD Lab): | Robert Prein |
| Approved By (HWMB): | FMG | Date: | 7/21/98 | Date (EPD Lab): | 7/21/98 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | KEN GRALL | **Sample ID :** | **AC19074** |
| **Date Received:** | 07/21/98 | **Date Collected:** | 07/20/98 |
| **Time Received:** | 09:44 | **Time Collected:** | 15:30 |
| **Reporting Date:** | 07/24/98 | **DNR Lab Reference:** | HW7743 |
| **Sample Site:** | Peach MAC Fort Valley HW7743 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***Organics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | ,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |



AMETER CODE: EPA
l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
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USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 48.1 | | ug/kg | SA1 | 07/21/98 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 47.1 | | ug/kg | SA1 | 07/21/98 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |

**Sample ID : AC19074**



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
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**Laboratory Contacts:**

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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | n-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | -Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | aphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Trace | | ug/kg | SA1 | 07/21/98 |
| | Toluene | 34483 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 52.1 | | ug/kg | SA1 | 07/21/98 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SA1 | 07/21/98 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SA1 | 07/21/98 |

**Sample comments :**

*End of Report*



AMETER CODE: EPA
l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# FROST ASSOCIATES

88 Founders Village, Clinton, CT 06426
(860) 669-5859 FAX (860) 669-5859


September 16, 1997

To: Environmental Protection Division
205 Butler St., Floyd Towers East, Suite 1154
Atlanta, GA 30334

Attn: James Ussery

Fr: Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Fabra Care Cleaners
Fort Valley, GA

CERCLIS:

Job:

Site Longitude: 83-53-15.5 83.887642
ite Latitude : 32-33-08 32.552219

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the in-ıded Block Groups. Boundary records are then sorted in adjacent side order to ..termine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adjacent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and . The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)}

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 populu tion and house count extracted from the Census Bureau's 1990 STF-1A files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

Fabra Care Cleaners
Fort Valley, GA

| No. | City | Block Group ID | Blk Grp People | House Holds | Public Water | Drilled Wells | Dug Wells | Other |
|---|---|---|---|---|---|---|---|---|
| 1 | Zenith | 13079 0702 3 | 1021 | 358 | 35 | 298 | 42 | 0 |
| 2 | Marshallville | 13193 9801 1 | 889 | 327 | 245 | 66 | 28 | 0 |
| 3 | Marshallville | 13193 9801 2 | 1119 | 369 | 303 | 44 | 24 | 0 |
| 4 | Fort Valley | 13225 0402 1 | 1930 | 718 | 453 | 194 | 19 | 0 |
| 5 | Fort Valley | 13225 0402 2 | 1842 | 600 | 476 | 85 | 23 | 10 |
| 6 | Fort Valley | 13225 0404 1 | 4415 | 1258 | 1275 | 36 | 0 | 0 |
| 7 | Fort Valley | 13225 0404 2 | 1160 | 456 | 435 | 28 | 0 | 0 |
| 8 | Fort Valley | 13225 0404 3 | 132 | 49 | 4 | 24 | 4 | 0 |
| 9 | Fort Valley | 13225 0403011 | 2434 | 888 | 744 | 100 | 52 | 0 |
| 10 | Fort Valley | 13225 0403012 | 267 | 136 | 122 | 0 | 0 | 0 |
| 11 | Fort Valley | 13225 0403013 | 74 | 25 | 11 | 16 | 0 | 0 |
| 12 | Fort Valley | 13225 0403021 | 1773 | 728 | 702 | 45 | 0 | 0 |
| | Totals: | | 17056 | 5912 | 4805 | 936 | 192 | 10 |

Fabra Care Cleaners
Fort Valley, GA

| City | Census Tract ID | Tract People | House Count | Public Water | Drilled Wells | Dug Wells | Other Sources |
|---|---|---|---|---|---|---|---|
| Fort Valley | 13225 0404 2 | 1160 | 456 | 435 | 28 | 0 | 0 |
| Fort Valley | 13225 0404 3 | 132 | 49 | 4 | 24 | 4 | 0 |
| Fort Valley | 13225 0403011 | 2434 | 888 | 744 | 100 | 52 | 0 |
| Fort Valley | 13225 0402 1 | 1930 | 718 | 453 | 194 | 19 | 0 |
| Fort Valley | 13225 0402 2 | 1842 | 600 | 476 | 85 | 23 | 10 |
| Fort Valley | 13225 0404 1 | 4415 | 1258 | 1275 | 36 | 0 | 0 |
| Fort Valley | 13225 0403012 | 267 | 136 | 122 | 0 | 0 | 0 |
| Fort Valley | 13225 0403013 | 74 | 25 | 11 | 16 | 0 | 0 |
| Fort Valley | 13225 0403021 | 1773 | 728 | 702 | 45 | 0 | 0 |
| | Sub Totals: | 14027 | 4858 | 4222 | 528 | 98 | 10 |
| Marshallville | 13193 9801 1 | 889 | 327 | 245 | 66 | 28 | 0 |
| Marshallville | 13193 9801 2 | 1119 | 369 | 303 | 44 | 24 | 0 |
| | Sub Totals: | 2008 | 696 | 548 | 110 | 52 | 0 |
| Zenith | 13079 0702 3 | 1021 | 358 | 35 | 298 | 42 | 0 |
| | Sub Totals: | 1021 | 358 | 35 | 298 | 42 | 0 |

Fabra Care Cleaners
Fort Valley, GA

›r Radius of 4 Mi., Circle Area = 50.265482

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 1 | Zenith | 13079 7023 | 54.974030 | 3.911922 | 7.12 |
| 2 | Marshallville | 13193 98011 | 32.482395 | 0.071163 | 0.22 |
| 3 | Marshallville | 13193 98012 | 44.204327 | 0.232980 | 0.53 |
| 4 | Fort Valley | 13225 4021 | 23.838928 | 9.110622 | 38.22 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 8.647540 | 34.26 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 6.760180 | 44.74 |
| 7 | Fort Valley | 13225 4042 | 3.236877 | 2.526381 | 78.05 |
| 8 | Fort Valley | 13225 4043 | 10.538761 | 0.837377 | 7.95 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 10.406000 | 92.17 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.132096 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533354 | 0.533354 | 100.00 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 7.095866 | 90.88 |
| | Totals: | | 229.388809 | 50.265484 | |

For Radius of 3 Mi., Circle Area = 28.274334

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 4.625260 | 19.40 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 5.102531 | 20.22 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 4.087371 | 27.05 |
| 7 | Fort Valley | 13225 4042 | 3.236877 | 1.235329 | 38.16 |
| 8 | Fort Valley | 13225 4043 | 10.538761 | 0.068782 | 0.65 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 7.687730 | 68.09 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.132096 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533354 | 0.533354 | 100.00 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 4.801882 | 61.50 |
| | Totals: | | 97.728050 | 28.274334 | |

For Radius of 2 Mi., Circle Area = 12.566371

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 1.856596 | 7.79 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 2.323050 | 9.20 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 2.179006 | 14.42 |
| 7 | Fort Valley | 13225 4042 | 3.236877 | 0.279146 | 8.62 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 3.111732 | 27.56 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.132096 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533354 | 0.182136 | 34.15 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 2.502609 | 32.05 |
| | Totals: | | 87.189293 | 12.566371 | |

Fabra Care Cleaners
Fort Valley, GA

For Radius of 1 Mi., Circle Area = 3.141593

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 0.484847 | 2.03 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 0.901876 | 3.57 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 0.755243 | 5.00 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 0.359703 | 3.19 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.129773 | 98.24 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 0.510150 | 6.53 |
| | Totals: | | 83.419060 | 3.141593 | |

For Radius of .5 Mi., Circle Area = 0.785398

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 0.133213 | 0.56 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 0.235778 | 0.93 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 0.221664 | 1.47 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 0.194744 | 2.49 |
| | Totals: | | 71.996796 | 0.785398 | |

For Radius of .25 Mi., Circle Area = 0.196350

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 5 | Fort Valley | 13225 4022 | 25.240259 | 0.084988 | 0.34 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 0.037955 | 0.25 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 0.073407 | 0.94 |
| | Totals: | | 48.157867 | 0.196350 | |

Fabra Care Cleaners
Fort Valley, GA

========== Site Data ==========

| | |
|---|---|
| Population: | 9754.95 |
| Households: | 3316.32 |
| Drilled Wells: | 309.62 |
| Dug Wells: | 66.56 |
| Other Water Sources: | 3.43 |

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

| | |
|---|---|
| Population: | 3371.40 |
| Households: | 1145.12 |
| Drilled Wells: | 125.55 |
| Dug Wells: | 22.79 |
| Other Water Sources: | 1.40 |

** Population On Private Wells: 436.75

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

| | |
|---|---|
| Population: | 3329.80 |
| Households: | 1123.25 |
| Drilled Wells: | 107.67 |
| Dug Wells: | 25.84 |
| Other Water Sources: | 1.10 |

* Population On Private Wells: 395.79

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

| | |
|---|---|
| Population: | 2231.75 |
| Households: | 731.42 |
| Drilled Wells: | 61.63 |
| Dug Wells: | 15.06 |
| Other Water Sources: | 0.56 |

** Population On Private Wells: 234.01

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

| | |
|---|---|
| Population: | 657.88 |
| Households: | 264.85 |
| Drilled Wells: | 11.33 |
| Dug Wells: | 2.54 |
| Other Water Sources: | 0.26 |

** Population On Private Wells: 34.47

Fabra Care Cleaners
Fort Valley, GA

--- Within Ring: .5 Mile(s) and .25 Mile(s) ----

| | |
|---|---|
| Population: | 111.95 |
| Households: | 36.00 |
| Drilled Wells: | 2.70 |
| Dug Wells: | 0.24 |
| Other Water Sources: | 0.06 |

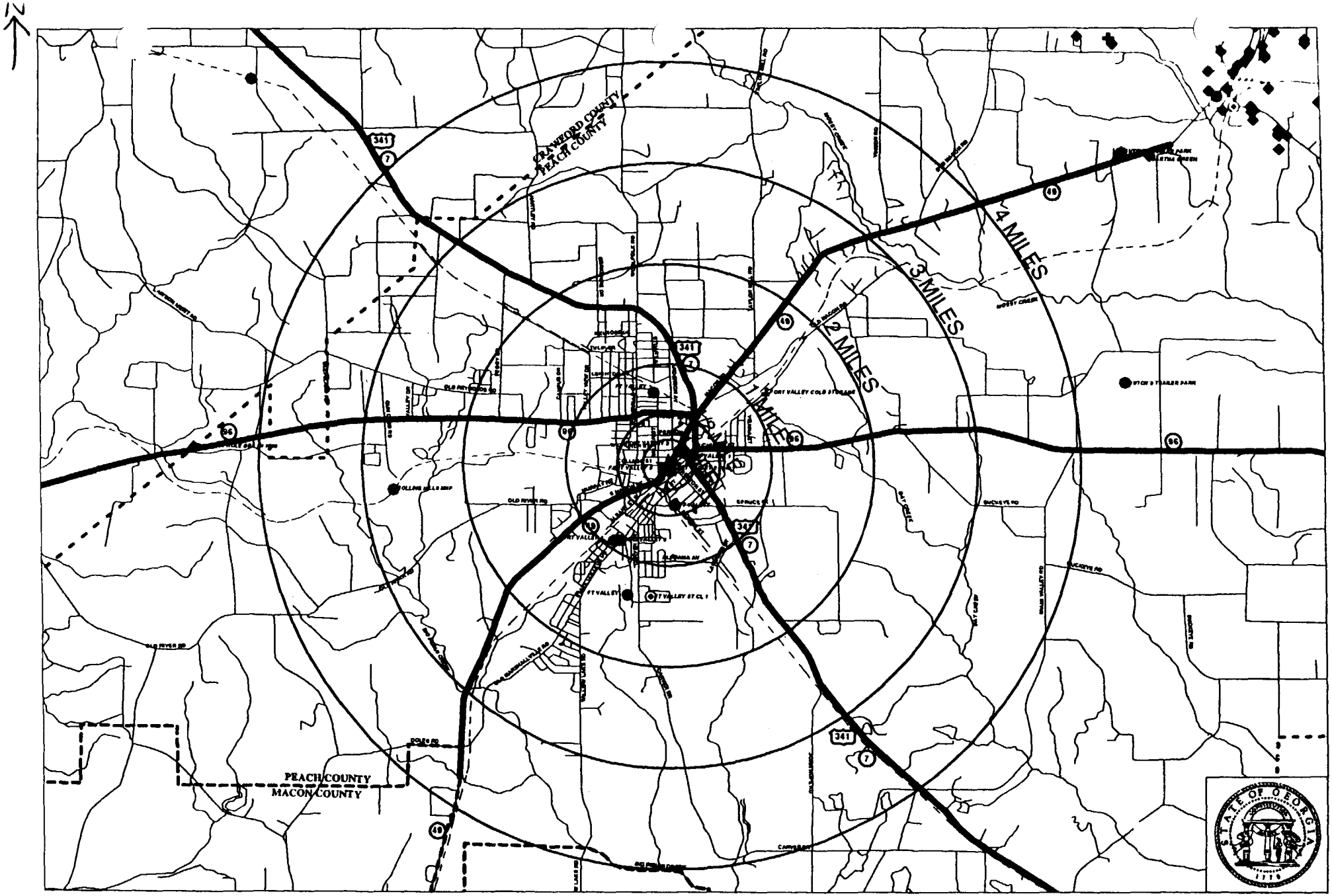
** Population On Private Wells: 9.15

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

| | |
|---|---|
| Population: | 52.16 |
| Households: | 15.68 |
| Drilled Wells: | 0.74 |
| Dug Wells: | 0.08 |
| Other Water Sources: | 0.03 |

** Population On Private Wells: 2.71

** Total Population On Private Wells: 1112.89

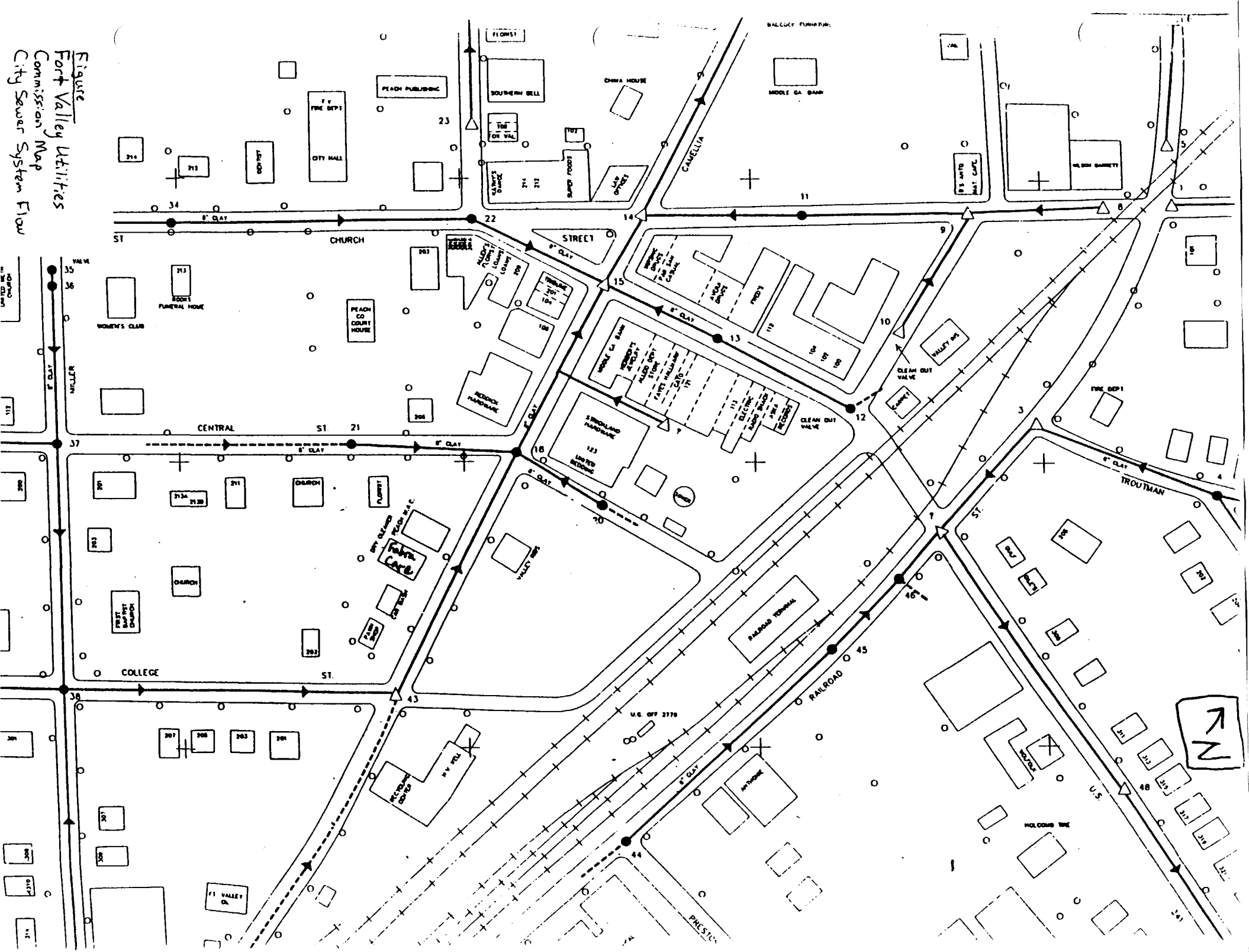


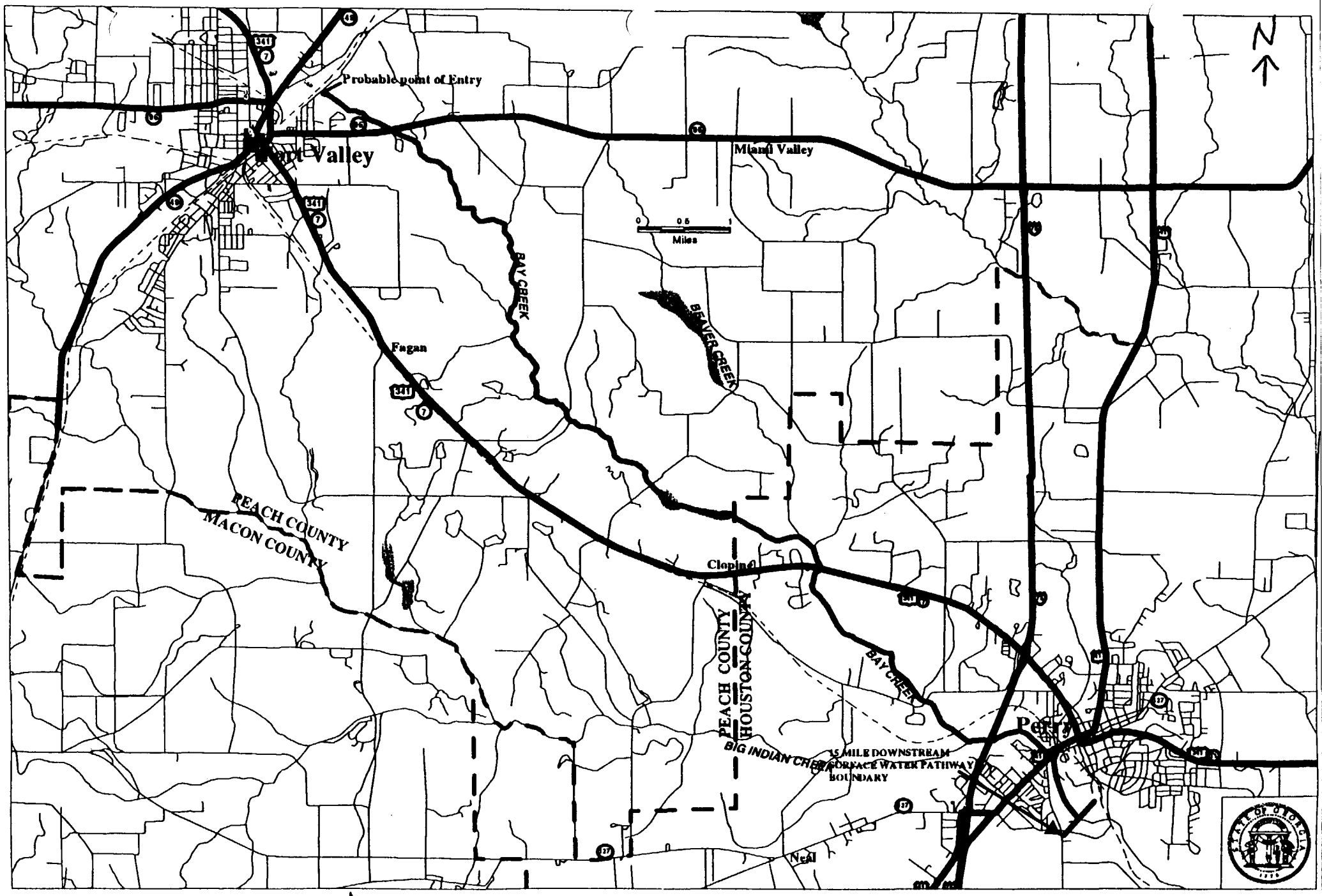

8/29/97

- Census Block Group with >zero non-public supply well
- Census Block Group served by public water
- Public Supply Well
- Surface W[illegible]ke
- Domestic [illegible]
- Unused Well
- Spring
- Industrial Well
- Commercial Well
- Irrigation Well
- Livestock well
- Well - Unknown use
- Other Well
- County Boundary
- Road
- Major Highway
- Stream/River
- Railroad

SOURCES: Georgia Public Water Source Inventory, 1994; US Census Bureau 1990; Ga. Water Source Inv., USGS, 1995

Figure
Fort Valley Utilities
Commission Map
City Sewer System Flow






Surface Water Pathway
Hydrology
County Boundary
Projected Sur Pathway
Major Highw
Major Wetland

Site Location
City/Town
Unincorporated Town

# FORT VALLEY, PEACH COUNTY
## 15 MILE SURFACE WATER DOWNSTREAM PATHWAY

Source: 1990 Census Bureau (TIGER), US EPA (GIRAS Landuse), GA DOT (Wetlands)

# REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV



**EPA ID:** GASFN0406881 **Site Name:** PEACH MAXIMUM AUTO CARE (PEACH MAC) **State ID:**

**Alias Site Names:**

**City:** FORT VALLEY **County or Parish:** PEACH **State:** GA

**Refer to Report Dated:** **Report Type:** PRELIMINARY ASSESSMENT 001

**Report Developed by:**

**DECISION:**

- [ ] **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**
  - [ ] **1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)**
  - [ ] **1b. Site may qualify for action, but is deferred to:**
- [x] **2. Further Assessment Needed Under CERCLA:**
  - **2a. Priority:** [x] **Higher** [ ] **Lower**
  - **2b. Other: (recommended action)**

**DISCUSSION/RATIONALE:**

Since PCE has been detected in two municipal wells in Fort Valley, Georgia, a site inspection is necessary to determine if this site is a source of PCE.

**Site Decision Made by:** ALAN W. YARBROUGH

**Signature:** Alan W. Yarbrough **Date:** 10/22/98

**EPA Form # 9100-3**

# SUMMARY PRELIMINARY ASSESSMENT

**Site Information:**

Peach Maximum Auto Care (Peach MAC)
200 S. Camellia Blvd.
Fort Valley, Georgia 31030
Phone: 912-825-8628

EPA ID Number: GAD984319012

Latitude: 32° 33' 08.5" N
Longitude: 83° 53' 15.0" W

**Directions to the Site:**

From Atlanta, take I-75 South through Macon. Exit SR 96 to the right, in Peach County. Fort Valley is approximately 10 miles east of I-75 on SR 96. The site is at the intersection of South Camellia Blvd. and Central Ave. in downtown Fort Valley.

**Site Location:** See figure.

**Site Description, Operational History and Waste Characteristics:**

On December 29, 1992 Peach MAC notified as a small quantity generator of hazardous waste. The notification indicated the facility generates D001 (ignitable) and D008 (lead) wastes. During an October 31, 1995 compliance evaluation inspection it was noted the facility was generating D001 (ignitable) and D039 (PCE) hazardous wastes.

According to the manager the current automobile repair business has occupied the building for the last 16 years. Solvents are used at Safety Kleen parts cleaning stations. The solvent supplied by Safety Kleen is 85% mineral spirits and contains less than 0.5% tetrachloroethylene. The building is approximately 35 years old and prior to being occupied by Peach MAC the facility was a tire store and automobile repair facility.

PCE has been found above detection limits in Fort Valley Municipal Water Supply Wells 1 and 2. The site is within the outer-management zone of the wellhead protection areas for both Municipal Wells 1 and 2.

**Recommendations:**

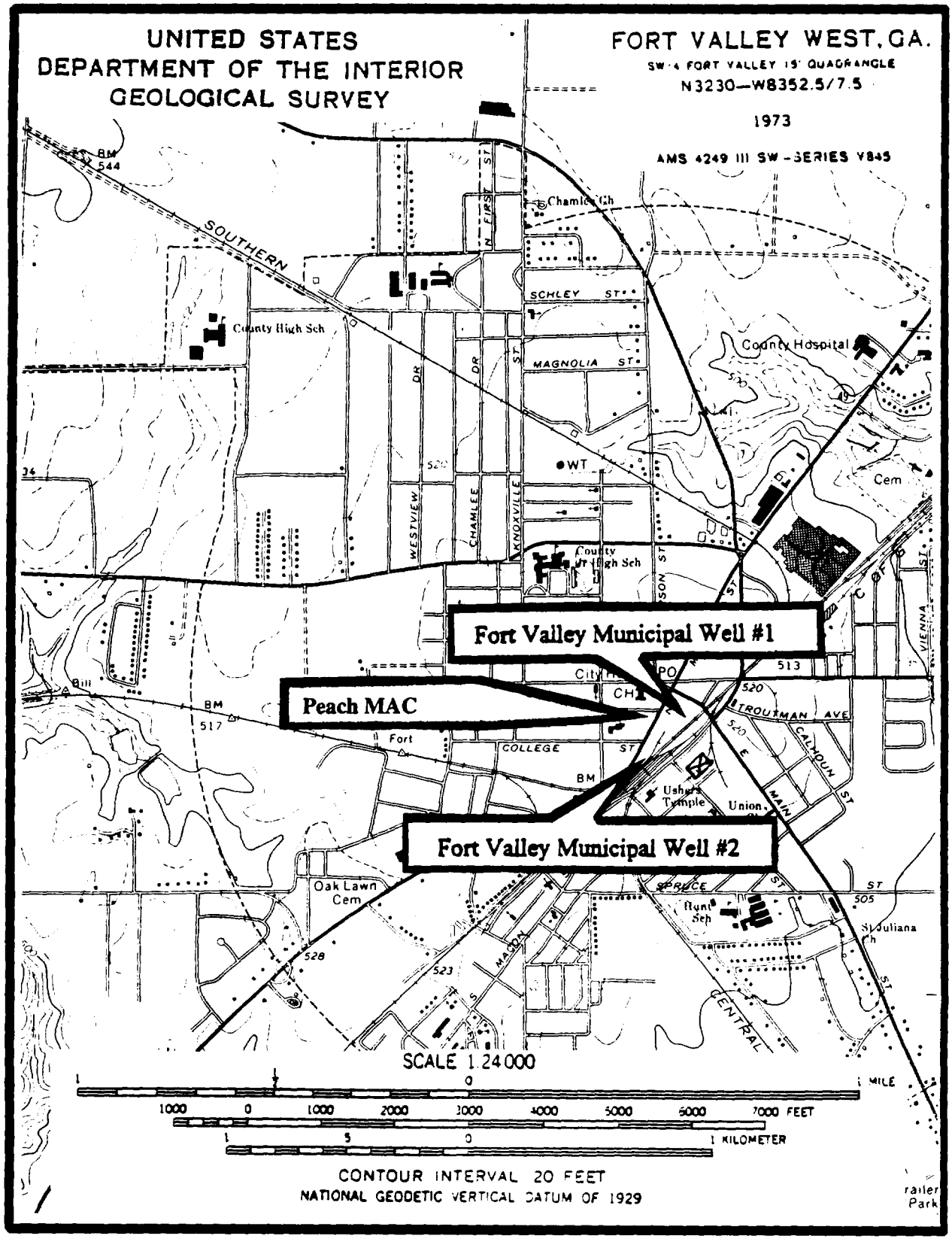
A Sampling Site Inspection (SSI) should be conducted at this site to evaluate the threat posed by the site via associated exposure pathways to residents and sensitive environments.

**Investigator:**

Kenneth Grall
Environmental Engineer
Hazardous Waste Management Branch
Georgia Environmental Protection Division
Phone: 404-656-2833

R:\KENG\CERCLA\PA\PEACHMAC.SUM

**Figure. Location of Peach MAC in relation to Fort Valley Municipal Wells #1 and #2.**



# SITE INVESTIGATION

## FABRACARE CLEANERS
## 204 SOUTH CAMELIA BOULEVARD
## FORT VALLEY, GEORGIA 31030

August 31, 1998

Prepared By:

**Georgia Department of Natural Resources**
**Environmental Protection Division**
**Hazardous Waste Management Branch**


Prepared By:

Ann E. Roat
Environmental Specialist

Reviewed
~~Approved~~ By:

Charles D. Williams
Unit Coordinator


10716764

## TABLE OF CONTENTS


**SECTION NUMBER** . . . . . PAGE

1.0 INTRODUCTION . . . . . 3

2.0 SITE DESCRIPTION, OPERATIONAL HISTORY AND WASTE CHARACTERISTICS . . . . . 3
- 2.1 Location . . . . . 3
- 2.2 Site Description . . . . . 3
- 2.3 Operational History and Waste Characteristics . . . . . 3

3.0 WASTE/SOURCE SAMPLING . . . . . 4
- 3.1 Sample Locations . . . . . 4
- 3.2 Analytical Results . . . . . 5
- 3.3 Conclusions . . . . . 9

4.0 GROUND WATER PATHWAY . . . . . 9
- 4.1 Hydrogeology . . . . . 9
- 4.2 Targets . . . . . 9
- 4.3 Sample Locations . . . . . 9
- 4.4 Analytical Results . . . . . 10
- 4.5 Conclusions . . . . . 13

5.0 SURFACE WATER PATHWAY . . . . . 14
- 5.1 Hydrology . . . . . 14
- 5.2 Targets . . . . . 14
- 5.3 Sample Locations . . . . . 14
- 5.4 Conclusions . . . . . 14

6.0 SOIL EXPOSURE AND AIR PATHWAYS . . . . . 15
- 6.1 Physical Conditions . . . . . 15
- 6.2 Soil and Air Targets . . . . . 15
- 6.3 Soil Sample Locations . . . . . 15
- 6.4 Soil Analytical Results . . . . . 16
- 6.5 Conclusions . . . . . 16

7.0 SUMMARY AND CONCLUSIONS . . . . . 16

References . . . . . 18

List of Figures . . . . . 19

List of Attachments . . . . . 19

## 1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Reauthorization Act of 1986 (SARA), the Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch conducted a site investigation (SI) at the Fabracare Cleaners in Peach County, Georgia. The purpose of this investigation was to collect information concerning conditions at the site to assess the threat posed to human health and the environment. In addition, it was to determine the possible migration of hazardous substances from the site to the groundwater supply. The investigation was also needed to determine the need for additional investigation under CERCLA or other authority, and if appropriate, support site evaluation using the Hazard Ranking System (HRS) for proposal to the National Priorities List (NPL). The investigation included reviewing previous information, sampling waste and environmental media to evaluate and document HRS factors, and collecting additional non-sampling information.

## 2.0 SITE DESCRIPTION, OPERATIONAL HISTORY AND WASTE CHARACTERISTICS

### 2.1 Location

Fabracare Cleaners is located off of South Camelia Boulevard (SR 49) just north of College Street and south of Central Street in Peach County. The geographic coordinates are 32° 33' 08.0" north latitude and 83° 53' 15.5" west longitude as shown on the United States Geological Survey (U.S.G.S.) Quadrangle Topographical Map (Reference 1. Figure 1).

To reach the site from Atlanta, take I-75 South through Macon and exit at SR 49 (exit #46) to the right in Peach County. Fort Valley is approximately 10 miles southwest of I-75 on SR 49.

The warm and humid climate of Peach County is characterized by long, hot summers and short, mild winters. The average rainfall is about 48 inches per year. March and July are normally the wettest months, each averaging more than five inches of rainfall. Fall is the driest part of the year, but no month has an average of less than two inches of rainfall (Soil Survey, 1967).

### 2.2 Site Description

The site is located on approximately .22 of an acre of land in Peach County, Fort Valley, Georgia. The property is rectangular in shape and relatively flat. It consists of the one building for the dry-cleaning business and a concrete parking lot that covers the whole area. No soil is exposed. Tetrachloroethene {or Perchloroethylene -(PCE)} has been identified above detection limits in the Fort Valley Municipal Water Supply Wells 1 (located on Central Avenue behind the water treatment plant near the intersection of Railroad St.) and 2 (located on N. Camelia Boulevard {SR 49} near the intersection of Miller Street and the railroad crossing). The Fabracare Cleaners dry cleaning facility is located approximately 500 feet from Well 1 and 600 feet from Well 2 and is within the wellhead protection area of these municipal wells.

### 2.3 Operational History and Waste Characteristics

According to the manager, this dry cleaner has been operating since 1967 and does currently use PCE. A new dry cleaning machine was installed in February, 1997 and a concrete-walled boundary

was built around the machine. It is located on the east side of the building, right next to the wall. The previous machine was in the same location, situated directly on the concrete floor with no barrier surrounding it. The PCE is presently being reused after being filtered utilizing a refrigeration process. The spent filters are then placed in metal cans that are stored inside, on the west side of the facility, near the wall. They are shipped off monthly to MCF Systems of Atlanta for treatment. It is not known if the waste dry cleaning fluids were released in the past from the area around the previous machine or anywhere outside the facility. It is also not known how the filters were handled or stored in the past.

## 3.0 WASTE/SOURCE SAMPLING

### 3.1 Sample Locations

Table 1 presents sample numbers, and locations for all samples collected during the site investigation. Ten samples were collected by the EPD to evaluate the site. Table 2 shows the additional samples that were taken by the Geological Survey from the soil areas around the five wells that they had installed during their investigation. The rationale for location and type of samples collected is discussed in the pathway section of this report. Figure 2 shows sample locations for EPD and Figure 5 shows the sample locations of the five wells that were installed by the Geological Survey.

**TABLE 1: SOIL SAMPLE LOCATIONS BY THE EPD**

| Sample No. | Location | Date | Time |
|---|---|---|---|
| 1A | Hole#1: sampled at 2-3 foot depth- East side of building | 10/29/97 | 1055 |
| 1B | Hole#1: sampled at 3-4 foot depth- East side of building | 10/29/97 | 1103 |
| 1C | Hole#1: sampled at 4- 5 foot depth- East side of building | 10/29/97 | 1108 |
| 1D | Hole#1: sampled at 5- 6 foot depth- East side of building | 10/29/97 | 1120 |
| 1 E | Hole#1: sampled at 8-10 foot depth-East side of building | 10/29/97 | 1137 |
| 2A | Hole#2: sampled at 2-3 foot depth-North side of building | 10/29/97 | 1147 |
| 2B | Hole#2: sampled at 3-4 foot depth- North side of building | 10/29/97 | 1154 |
| 2C | Hole#2: sampled at 4-5 foot depth- North side of building | 10/29/97 | 1158 |
| 2D | Hole#2: sampled at 5-6 foot depth- North side of building | 10/29/97 | 1204 |
| 2 E | Hole#2: sampled at 8-10 foot depth-North side of building | 10/29/97 | 1211 |

**TABLE 2: SOIL SAMPLE LOCATIONS BY THE GEOLOGICAL SURVEY**

| Sample No. | Location | Date |
|---|---|---|
| 2A | Soil from area of Well # 2 - Northwest of City Well # 1 | 10/07/97 |
| 2B | Soil from area of Well # 2 - Northwest of City Well # 1 | 03/18/98 and 03/23/98 |
| 3A | Soil from area of Well # 3 - East of City Well # 5 | 10/08/97 and 10/14/97 and 10/15/97 |
| 3B | Soil from area of Well # 3 - East of City Well # 5 | 03/31/98 |
| 4B | Soil from area of Well # 4 - West of Car Wash facility | 04/15/98 |
| 5A | Soil from area of Well # 5 - South of Fabracare facility | 01/05/98 and 01/06/98 |
| 5B | Soil from area of Well # 5 - South of Fabracare facility | 02/25/98 |

### 3.2 Analytical Results

In the samples collected by EPD, a trace of acetone was found in 1d and 2a and some additional amounts of acetone was found in 1a and 2d. A trace of 1,1 - dichloroethene was found in 2e. A trace of toluene was found in 1a and 2a. Tetrachloroethene was found in 1a, 1b, 1c, 1d, 2a, 2b, 2c, and 2e. Trichloroethene was found in 2a. No other contaminants were detected at the site. Table 3 shows the analytical results for these samples.

In the samples collected by the Geological Survey, a trace and some additional amounts of toluene was found in 2A, 2B, 3A, 3B, 5A, and 5B. A trace of ethylbenzene was found in 5A. A trace of xylenes was found in 5A. A trace and an additional amount of acetone was found in 2A and 5A. A trace of carbon disulfide was found in 5B. PCE was found in trace and some additional amounts in 2B, 4B, and 5A. Methylene chloride was found in 4B. Trichloroethene was found in 4B. Table 4 shows the analytical results for these samples.

## TABLE 3: SAMPLE RESULTS FROM THE EPD INVESTIGATION

| Fabracare Cleaners Soil Samples Volatile Organic Analysis (ug/kg) | | | | | |
|---|---|---|---|---|---|
| **Sample Number** | **Acetone** | **1,1-Dichloroethene** | **Toluene** | **Tetrachloroethene (PCE)** | **Trichloroethene** |
| 1A | 104 | ND | Trace | 67.3 | ND |
| 1B | ND | ND | ND | 11.5 | ND |
| 1C | ND | ND | ND | 17 | ND |
| 1D | Trace | ND | ND | 28.9 | ND |
| 1 E | ND | ND | ND | ND | ND |
| 2A | Trace | ND | Trace | 945 | 10.9 |
| 2B | ND | ND | ND | 44 | ND |
| 2C | ND | ND | ND | 9.46 | ND |
| 2D | 171 | ND | ND | ND | ND |
| 2 E | ND | Trace | ND | 5.22 | ND |

**NOTES:** ND - not detected
Trace - detected below quantitation limits

**TABLE 4: SAMPLE RESULTS FROM THE GEOLOGICAL SURVEY INVESTIGATION**

| Soil Samples Volatile Organic Analysis (ug/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sample Number | Depth (feet) | Date | Acetone | Carbon Disulfide | Ethyl-benzene | Methylene Chloride | PCE |
| 2A | 15.5 | 10/07/97 | 199 | ND | ND | ND | ND |
| 2A | 23.8 | 10/07/97 | 153 | ND | ND | ND | ND |
| 2B | 63 | 03/18/98 | ND | ND | ND | ND | ND |
| 2B | 65.5 | 03/18/98 | ND | ND | ND | ND | ND |
| 2B | 68 | 03/18/98 | ND | ND | ND | ND | ND |
| 2B | 70 | 03/18/98 | ND | ND | ND | ND | ND |
| 2B | 75 | 03/23/98 | ND | ND | ND | ND | 5.86 |
| 3A | 10.9 | 10/08/97 | ND | ND | ND | ND | ND |
| 3A | 28.2 | 10/14/97 | ND | ND | ND | ND | ND |
| 3A | 30.7 | 03/31/98 | ND | ND | ND | ND | ND |
| 3B | 91 | 04/15/98 | ND | ND | ND | ND | ND |
| 4B | 57 | 04/15/98 | ND | ND | ND | 27.6 | 7.62 |
| 4B | 65 | 01/05/98 | ND | ND | ND | 60.8 | ND |
| 5A | 1 | 01/05/98 | 109 | ND | Trace | ND | 439 |
| 5A | 4 | 01/06/98 | ND | ND | ND | ND | 34.5 |
| 5A | 7.5 | 01/06/98 | 126 | ND | ND | ND | ND |
| 5A | 10.5 | 01/06/98 | 106 | ND | ND | ND | ND |
| 5A | 12.5 | 01/06/98 | Trace | ND | ND | ND | Trace |
| 5A | 15.5 | 01/06/98 | 112 | ND | ND | ND | ND |
| 5A | 17.5 | 01/06/98 | 101 | ND | ND | ND | ND |
| 5A | 20.5 | 01/06/98 | 138 | ND | ND | ND | ND |
| 5A | 24.6 | 01/06/98 | 119 | ND | ND | ND | ND |
| 5B | 61.5 | 02/25/98 | ND | Trace | ND | ND | ND |
| 5B | 63 | 02/25/98 | ND | ND | ND | ND | ND |

**NOTES:** ND - not detected, Trace - detected below quantitation limits

**TABLE 4 (CONT.): SAMPLE RESULTS FROM THE GEOLOGICAL SURVEY INVESTIGATION**

| Soil Samples Volatile Organic Analysis (ug/kg) | | | | | |
|---|---|---|---|---|---|
| Sample Number | Depth (feet) | Date | Toluene | Trichloro-ethene | Xylenes |
| 2A | 15.5 | 10/07/97 | Trace | ND | ND |
| 2A | 23.8 | 10/07/97 | Trace | ND | ND |
| 2B | 63 | 03/18/98 | Trace | ND | ND |
| 2B | 65.5 | 03/18/98 | Trace | ND | ND |
| 2B | 68 | 03/18/98 | Trace | ND | ND |
| 2B | 70 | 03/18/98 | Trace | ND | ND |
| 2B | 75 | 03/23/98 | ND | ND | ND |
| 3A | 10.9 | 10/08/97 | Trace | ND | ND |
| 3A | 28.2 | 10/14/97 | Trace | ND | ND |
| 3A | 30.7 | 03/31/98 | Trace | ND | ND |
| 3B | 91 | 04/15/98 | Trace | ND | ND |
| 4B | 57 | 04/15/98 | ND | 10.5 | ND |
| 4B | 65 | 01/05/98 | ND | ND | ND |
| 5A | 1 | 01/05/98 | 8.89 | ND | Trace |
| 5A | 4 | 01/06/98 | ND | ND | ND |
| 5A | 7.5 | 01/06/98 | Trace | ND | Trace |
| 5A | 10.5 | 01/06/98 | ND | ND | ND |
| 5A | 12.5 | 01/06/98 | Trace | ND | Trace |
| 5A | 15.5 | 01/06/98 | ND | ND | ND |
| 5A | 17.5 | 01/06/98 | ND | ND | ND |
| 5A | 20.5 | 01/06/98 | ND | ND | ND |
| 5A | 24.6 | 01/06/98 | Trace | ND | Trace |
| 5B | 61.5 | 02/25/98 | ND | ND | ND |
| 5B | 63 | 02/25/98 | Trace | ND | ND |

**NOTES:** ND - not detected, Trace - detected below quantitation limits

### 3.3 Conclusions

Sampling results indicate the presence of contaminants in the soil at the site. PCE was found in the soil beneath the pavement down to approximately 75 feet below the surface. During these sampling events PCE vapors were detected with air monitoring equipment at the head space of the boring holes, beneath the pavement and also down at the 8 to 10 foot range. This suggests that the contaminants from this site poses a potential threat to human health and the environment.

## 4.0 GROUND WATER PATHWAY

### 4.1 Hydrogeology

The City of Fort Valley is located in the Fort Valley Plateau District of the Coastal Plain physiographic province. The dominant feature of the Fort Valley Plateau District is a broad, flat topped topography with fewer streams and less local relief than adjacent districts (Soil Survey, 1976).

The City of Fort Valley is located in an outcrop area of the Lower Paleocene Clayton formation which consists of sandy brick-red clay and fine to coarse grained sand. The Clayton formation is underlain by the Providence Sand, Providence-Ripley-Cusetta, Blufftown-Eutaw, and Tuscaloosa formations. The shallow most aquifer is the Clayton (or perched) aquifer which is composed 10-35 feet of silty fine sand (Reference 2,3).

The Clayton aquifer is overlain by 10-15 feet of soil and a sandy clay unit, and underlain by an aerially extensive kaolin layer which ranges in thickness from 2-20 feet. Ground water in the Clayton aquifer is under water table conditions, and depth to ground water in this aquifer is approximately 25-30 feet below land surface (Reference 3).

The deepest aquifer in Fort Valley is the Tuscaloosa aquifer. It occurs at a depth of about 250 feet below land surface and is overlain by the Ripley/Blufftown - Eutaw semiconfining unit. Ground water in the Tuscaloosa aquifer occurs under confined conditions. The Tuscaloosa aquifer is the primary source of ground water to the high capacity wells in the area including Fort Valley City wells 1, 2 and 5 (Reference 2,3).

### 4.2 Targets

Most people within 4 miles of the Fabracare Cleaners obtain drinking water from a municipal well system operated by the City of Fort Valley Water System. Approximately 1113 residents use private wells for drinking water (Reference 4). The nearest municipal well is approximately 500 feet from the site.

The City of Fort Valley, Peach County currently has a wellhead protection permit, #2250001, with an expiration date of July 27, 2001.

### 4.3 Sample Locations

Table 5 presents sample numbers, and locations for the samples taken in close proximity to the site by the Geological Survey and the samples that had detections of contamination. The samples labeled with "a" originated from the perched aquifer and the samples labeled with a "b" originated from the water table aquifer. One well sampling event was during the time period of October '97 to

March '98 and an additional sampling event was conducted from the end of April '98 through the first couple of days of May '98. Figure 5 show the sample locations around the area.

**TABLE 5: SAMPLE LOCATIONS**

| Sample Number | Location | Date |
|---|---|---|
| 1a | Southwest of City Well # 1 | 10/01/97 and 04/98 - 05/98 |
| 1b | Southwest of City Well # 1 | 03/06/98 and 04/98 - 05/98 |
| 2a | Northwest of City Well # 1 | 10/16/97 and 04/98 - 05/98 |
| 2b | Northwest of City Well # 1 | 03/27/98 and 04/98 - 05/98 |
| 3b | East of City Well # 5 | 04/15/98 and 04/98 - 05/98 |
| 5a | South of the Fabracare Bldg | 1/16/98 and 04/98 - 05/98 |
| 5b | South of the Fabracare Bldg | 3/12/98 and 04/98 - 05/98 |
| Woolfolk MW-2C | Woolfolk Monitoring Well | 04/98 - 05/98 |
| Woolfolk MW-2P | Woolfolk Monitoring Well | 04/98 - 05/98 |
| Woolfolk MW-10 | Woolfolk Monitoring Well | 04/98 - 05/98 |
| Woolfolk MW-17 | Woolfolk Monitoring Well | 04/98 - 05/98 |
| Woolfolk MW-18 | Woolfolk Monitoring Well | 04/98 - 05/98 |
| Woolfolk MW-20 | Woolfolk Monitoring Well | 04/98 - 05/98 |
| Woolfolk MW-21 | Woolfolk Monitoring Well | 04/98 - 05/98 |
| Woolfolk MW-29 | Woolfolk Monitoring Well | 04/98 - 05/98 |
| Woolfolk MW-36 | Woolfolk Monitoring Well | 04/98 - 05/98 |

### 4.4 Analytical Results

EPD laboratory detected 1.11 ppb and 5.40 ppb PCE in Municipal Wells 1 and 2, respectively on October 10, 1996 and 0.53-0.55 ppb tetrachloroethene in Monitoring Well (MW -2a) (see figure 5) on October 16, 1997. The results from the shallow groundwater wells that were installed by the Geological Survey show a presence of acetone, carbon disulfide, chloroform, PCE, trichloroethene, cis-1,2-dichloroethylene, trans-1,2-dichloroethene, and 1,2-dichloroethane The results of the deep groundwater wells show a presence of chloroform, PCE, trichloroethene, cis-1,2-dichloroethylene, trans-1;1-dichloroethene, carbon disulfide, 1,2-dichloroethane, and 1,2-dibromo-3-chloropropane.

## TABLE 6: SAMPLE RESULTS FROM THE GEOLOGICAL SURVEY INVESTIGATIONS

| Initial Investigation in EPD Monitoring Wells Groundwater Samples Volatile Organic Analysis (ug/l) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sample Number | Date | Acetone | Carbon Disulfide | Chloro-form | Cis -1,2-dichloro-ethylene | PCE | Trichloro-ethene |
| 1A | 10/01/97 | 72.7 | ND | ND | ND | ND | ND |
| 1A | 10/01/97 | ND | ND | 2.09 | ND | ND | ND |
| 1A | 10/28/97 | ND | ND | 2.8 | ND | ND | ND |
| 1A | 10/28/97 | ND | ND | 2.35 | ND | ND | ND |
| 1B | 03/06/98 | ND | ND | 2.1 | 8.0 | 559 | 21 |
| 2A | 10/16/97 | ND | ND | ND | ND | 0.53 | ND |
| 2A | 10/16/97 | ND | ND | ND | ND | 0.55 | ND |
| 2B | 03/27/98 | ND | ND | Trace | 7.12 | 501 | 17.9 |
| 3B | 04/15/98 | ND | ND | ND | ND | 74.3 | ND |
| 5A | 01/16/98 | ND | Trace | Trace | 169 | 5,598 | 130.2 |
| 5B | 03/12/98 | ND | ND | ND | ND | 177 | ND |

**Notes:** ND - not detected
Trace - detected below quantitation limits
4B and 4A not sampled

## TABLE 6A: SAMPLE RESULTS FROM THE GEOLOGICAL SURVEY INVESTIGATIONS

| Detections in Perched Water Zone Groundwater Samples April 29, 1998- May 1, 1998 Volatile Organic Analysis (ug/l) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sample Number | Chloro-form | Carbon Disulfide | Cis-1,2-dichloro-ethylene | Trans-1,2-dichloro-ethene | PCE | Trichloro-ethene | 1,2-dichloro-ethane |
| 1A | 4.02 | ND | ND | ND | ND | ND | ND |
| 2A | ND | 12.8 | ND | ND | ND | ND | ND |
| 5A | ND | ND | 119 | Trace | 2110 | 119 | ND |
| Woolfolk MW-2C | ND | ND | ND | ND | ND | 0.76 | 2.59 |

**Notes:** ND - not detected
Trace - detected below quantitation limits

## TABLE 6B: SAMPLE RESULTS FROM THE GEOLOGICAL SURVEY INVESTIGATIONS

| Detections at Water Table Groundwater Samples April 29, 1998- May 1, 1998 Volatile Organic Analysis (ug/l) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Number | Chloro-form | Carbon Disulfide | Cis-1,2-dichloro-ethylene | Trans-1,2-dichloro-ethene | PCE | Trichloro-ethene | 1,2-dichloro-ethane | 1,2-dibromo-3-chloro-propane |
| 1B | Trace | ND | 9.88 | ND | 454 | 28.1 | ND | ND |
| 2B | Trace | ND | 20.2 | Trace | 771 | 57.0 | ND | ND |
| 3B | ND | ND | ND | ND | 51.0 | ND | ND | ND |
| 4B | ND | ND | Trace | ND | 418 | Trace | ND | ND |
| 5B | Trace | ND | ND | ND | 248 | Trace | ND | ND |
| Woolfolk MW-2P | 0.66 | ND | ND | ND | ND | ND | ND | ND |

**Notes:** ND - not detected, Trace - detected below quantitation limits

**TABLE 6B (CONT.): SAMPLE RESULTS FROM THE GEOLOGICAL SURVEY INVESTIGATIONS**

| Detections at Water Table Groundwater Samples April 29, 1998- May 1, 1998 Volatile Organic Analysis (ug/l) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Number | Chloro-form | Carbon Disulfide | Cis-1,2-dichloro-ethylene | Trans-1,2-dichloro-ethene | PCE | Trichloro-ethene | 1,2-dichloro-ethane | 1,2-dibromo-3-chloro-propane |
| Woolfolk MW-10 | 1.30 | ND | ND | ND | ND | ND | ND | ND |
| Woolfolk MW-17 | ND | ND | ND | ND | ND | ND | 1.02 | 2.36 |
| Woolfolk MW-17 | ND | ND | ND | ND | ND | ND | ND | 7.58 |
| Woolfolk MW-18 | 1.31 | ND | ND | ND | 0.66 | ND | ND | ND |
| Woolfolk MW-20 | ND | Trace | ND | ND | ND | ND | ND | ND |
| Woolfolk MW-21 | Trace | ND | ND | ND | 6.58 | ND | ND | ND |
| Woolfolk MW-29 | 1.95 | ND | ND | ND | ND | ND | 3.97 | ND |
| Woolfolk MW-29 | ND | ND | ND | ND | ND | ND | 5.5 | ND |
| Woolfolk MS-36 | 0.80 | ND | ND | ND | ND | ND | ND | ND |
| Woolfolk MW-36 | ND | 5.14 | ND | ND | ND | ND | ND | ND |

**Notes:** ND - not detected, Trace - detected below quantitation limits

### 4.5 Conclusions

The site is in an optimum hydrological location and has had a release of PCE. It is therefore a probable source of PCE contamination at the Fort Valley Municipal Water Supply Wells 1 and 2. However, there may still be other undiscovered contributing sources in the vicinity. According to the Geological Survey the highest PCE concentration was found in the Perched Zone. They also indicated that there is a distinct plume of PCE in the Water Table Aquifer and that the highest levels of PCE are just downgradient of Fabracare.(Reference 14)

## 5.0 SURFACE WATER PATHWAY

### 5.1 Hydrology

The site is located on a topographic plateau (Reference 1). The dry-cleaning business is located approximately 20 feet from the street with an asphalt paved parking lot located directly behind the building. Overland drainage from the site, during extremely wet periods, is thought to flow from the property to the stormwater line (in a southern direction). (Fig. 3, Reference 5) The stormwater line goes 1.4 miles northeast underneath the City of Fort Valley (Reference 6) and then discharges to Bay Creek, the surface water pathway probable point of entry (PPE). Bay Creek, with a flow rate less than 10 cubic feet per second, flows in a generally east-southeasterly direction approximately 11.9 miles before merging with Big Indian Creek. Big Indian Creek is a moderate size stream with an average flow rate of 86 cubic feet per second and an average low flow rate of 21 cubic feet per second (Reference 7).

There has been no Flood Insurance Administration Map produced for the Fort Valley area. However, a Flood Hazard Rate Map has been produced for the area. The Flood Hazard Rate Map shows the site to be outside the 500-year floodplain (Reference 8).

### 5.2 Targets

There are no drinking water intakes within 15 downstream miles (Figure 4). It is likely some recreational fishing (brim and bass) occurs in the area where Bay Creek merges into Big Indian Creek. There is limited access to this area by the public; therefore, only the people whom own properties along the creeks have the opportunity to catch fish (Reference 9). The distance between the dry-cleaning business and the fishery is approximately 13 miles. There are 8 miles of stream frontage wetlands located within 15 downstream miles of the site. The nearest wetland (approximately 50 acres, 0.5 mile frontage) is approximately 2.0 miles downstream from the site on Bay Creek (Reference 10)

### 5.3 Sample Locations

No surface water samples were taken to identify a release to Bay Creek and Big Indian Creek. Probable point of entry (PPE) were chosen for Bay Creek and Big Indian Creek based on the surface runoff, topography of the area and the stormwater line discharge.

### 5.4 Conclusions

A potential release of contaminants to surface water is not suspected because of the distance to the PPE. No drinking water intakes have been identified but sensitive environments (wetlands and fishery) have been identified. The surface water pathway is not of concern.

## 6.0 SOIL EXPOSURE AND AIR PATHWAYS

### 6.1 Physical Conditions

The site consists of the building for the dry-cleaning business and a concrete parking lot that covers the whole area. No soil is exposed. It is in a relatively flat area.

### 6.2 Soil and Air Targets

Employees work at the Fabracare Cleaners. There are no residences, schools or day care facilities within 200 feet. Sixteen residences are within 0.25 mile of the site. Table 2 lists the estimated population within 4 miles of the site (Reference 4).

**TABLE 5**
POPULATIONS FOR TARGET DISTANCES

| DISTANCE | POPULATION |
|---|---|
| 0 - ¼ mile | 52 |
| ¼ - ½ mile | 112 |
| ½ - 1 mile | 658 |
| 1 - 2 mile | 2232 |
| 2 - 3 mile | 3330 |
| 3 - 4 mile | 3372 |

Pursuant to the Georgia Endangered Wildlife Act of 1973 and the Federal Endangered Species Act of 1973, no wildlife is designated as a state and federally protected species (classified as endangered wildlife) whose range of habitats includes Peach and Houston Counties (Reference 11).

Pursuant to the Georgia Wildlife Preservation Act of 1973, Chamaecyparis thyoides (Linnaeus) Atlantic White Cedar, Nestronia umbellula (Rafinesque) Indian Olive, Sarracenia rubra (Walter) Sweet Pitcher plant and Trillium reliquum (Freeman) Relict Toadshade are designated as state protected species (classified threatened/endangered plants) whose range of habitat include Peach, Houston, Taylor, Talbot, Marion, Crawford, Muscogee, Macon and Schley Counties (Reference 12).

The above protected flora and fauna were not designated as terrestrial sensitive environments for the soil or air pathways due to the fact that none of the protected species were observed on-site or off-site during the reconnaissance.

### 6.3 Soil Sample Locations

Ten samples were collected by the EPD to investigate the soil exposure pathway. All samples were collected between 2.0 to 10.0 feet. Table 1 presents sample numbers, and locations for all samples collected during the site investigation. Table 2 shows the additional samples that were taken by the

Geological Survey from the soil areas around the five wells that they had installed during their investigation. Figure 2 shows sample locations for EPD and Figure 5 shows the sample locations of the five wells that were installed by the Geological Survey.

### 6.4 Soil Analytical Results

In the samples collected by EPD, a trace of acetone was found in 1d and 2a and some additional amounts of acetone was found in 1a and 2d. A trace of 1,1 - dichloroethene was found in 2e. A trace of toluene was found in 1a and 2a. Tetrachloroethene was found in 1a, 1b, 1c, 1d, 2a, 2b, 2c, and 2e. Trichloroethene was found in 2a. No other contaminants were detected at the site. Table 3 shows the analytical results for these samples. (Reference 13)

In the samples collected by the Geological Survey, a trace and some additional amounts of toluene was found in 2A, 2B, 3A, 3B, 5A, and 5B. A trace of ethylbenzene was found in 5A. A trace of xylenes was found in 5A. A trace and an additional amount of acetone was found in 2A and 5A. A trace of carbon disulfide was found in 5B. PCE was found in trace and some additional amounts in 2B, 4B, and 5A. Methylene chloride was found in 4B. Trichloroethene was found in 4B. Table 4 shows the analytical results for these samples. (Reference 14)

### 6.5 Conclusions

Sampling results indicate the presence of contaminants in the soil at the site. PCE was found in the soil beneath the pavement down to approximately 75 feet below the surface. During these sampling events PCE vapors were detected with air monitoring equipment at the head space of the boring holes, beneath the pavement and also down at the 8 to 10 foot range. This suggests that the contaminants from this site pose a potential threat to human health and the environment.

The air pathway is not considered a concern due to no odor or evidence of a release.

## 7.0 SUMMARY AND CONCLUSIONS

Environmental samples were collected and analyzed to determined the source of tetrachloroethene in Fort Valley Municipal Wells 1 and 2 and the potential migration pathways. In addition, information was collected to confirm target populations and environments potentially at risk from the site.

The sampling results have been submitted to the owners of the property. As a result, the owners notified the Hazardous Sites Response Program and the site is in the screening process to determine if it will be included in the Hazardous Sites Inventory. The Geological Survey has submitted the analytical results from their sampling events in draft form and was included in this report. They will submit a final report describing their investigation and any additional information regarding the Ft. Valley area in the near future. In July of 1998 the United States Environmental Protection Agency Science and Ecosystem Support Division (USEPA SESD) conducted a further investigation of the Fabracare property. The results indicated the presence of PCE in the shallow groundwater and in the soil in this area.

Based on sample data from the EPD site investigation, the Geological Survey analytical results and the analytical results from USEPA SESD and evaluation of contaminant pathways and targets, there

is a potential that human health and the environment could be adversely affected by the site.

The area is a most significant recharge area and higher pollution susceptibility area. A release of PCE from the site to the soil and groundwater has occurred and this site is a contributor and a probable source of this contaminant to the city wells of Fort Valley . Yet, there may also be other sources of PCE in the area that have had a release. Additional investigations are still being conducted in the surrounding areas and are needed to confirm the source(s) of PCE releases.

## REFERENCES


1. U. S. Geologic Survey 7.5 Minute Series Topographic Maps: Fort Valley West Quadrangle, 1973 (photo revised 1985); Fort Valley East Quadrangle, 1973 (photo revised 1985); Perry West Quadrangle, 1972 (photo revised 1984); Marshallville Quadrangle, 1972.

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14. Draft Analytical Data Reports and Maps from the U.S. Geological Survey, 1998.

## FIGURES

1. Site Location Map: U.S. Geologic Survey 7.5 Minute Topographic Map of Georgia

2. Site Layout and Sample Locations

3. City Sewer System Flow Map

4. 15 Mile Surface Water Downstream Pathway

5. Geologic Survey Drilling Locations

## ATTACHMENTS

Attachment A - Geologic Survey Topographic Map

Attachment B - Chain of Custody Form

Attachment C - Laboratory Sample Results

Attachment D - CENTRACTS Data

Attachment E - Site Inspection Sampling and Analysis Plan

Attachment F - Site Reconnaissance and Site Investigation Trip Reports

Attachment G - Site Photographs

Figure 1

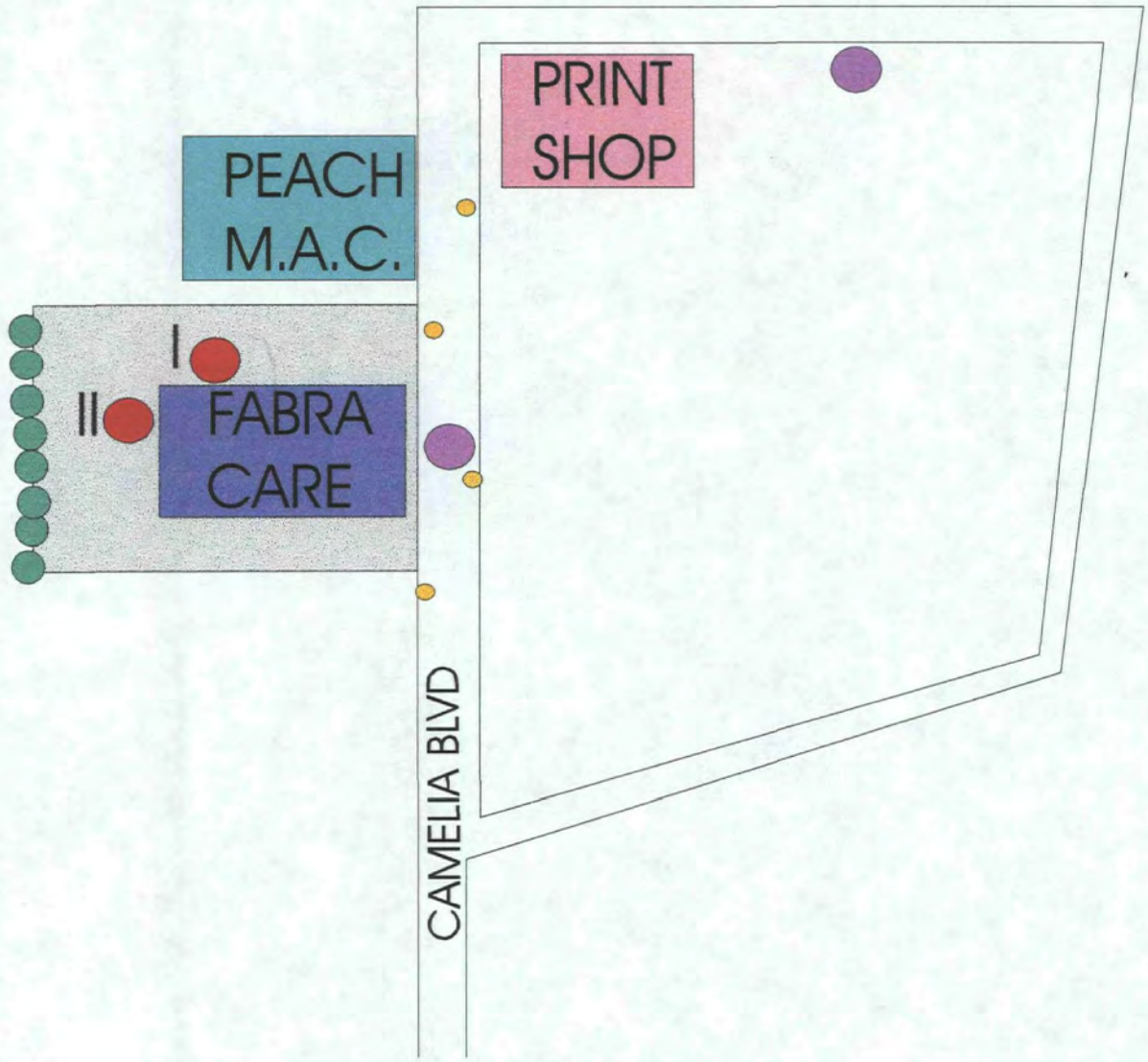
8/29/97

Census Block Group with >zero non-public supply well
Census Block Group served by public water
Public Supply Well
Surface Water Intake
Domestic Well
Unused Well
Spring
Industrial Well
Commercial Well
Irrigation Well
Livestock well
Well - Unknown use
Other Well
County Boundary
Road
Major Highway
Stream/River
Railroad

# FABRACARE CLEANERS
# COLLEGE STREET & STATE HIGHWAY 49
# FORT VALLEY, PEACH COUNTY

**1/2, 1, 2, and 3 MILE RADII Well Location**

SOURCES: Georgia Public Water Source Inventory, 1994; US Census Bureau 1990; Ga. Water Source Inv., USGS, 1995




= GROUNDWATER SAMPLE LOC.

= STORM DRAIN

= SAMPLE

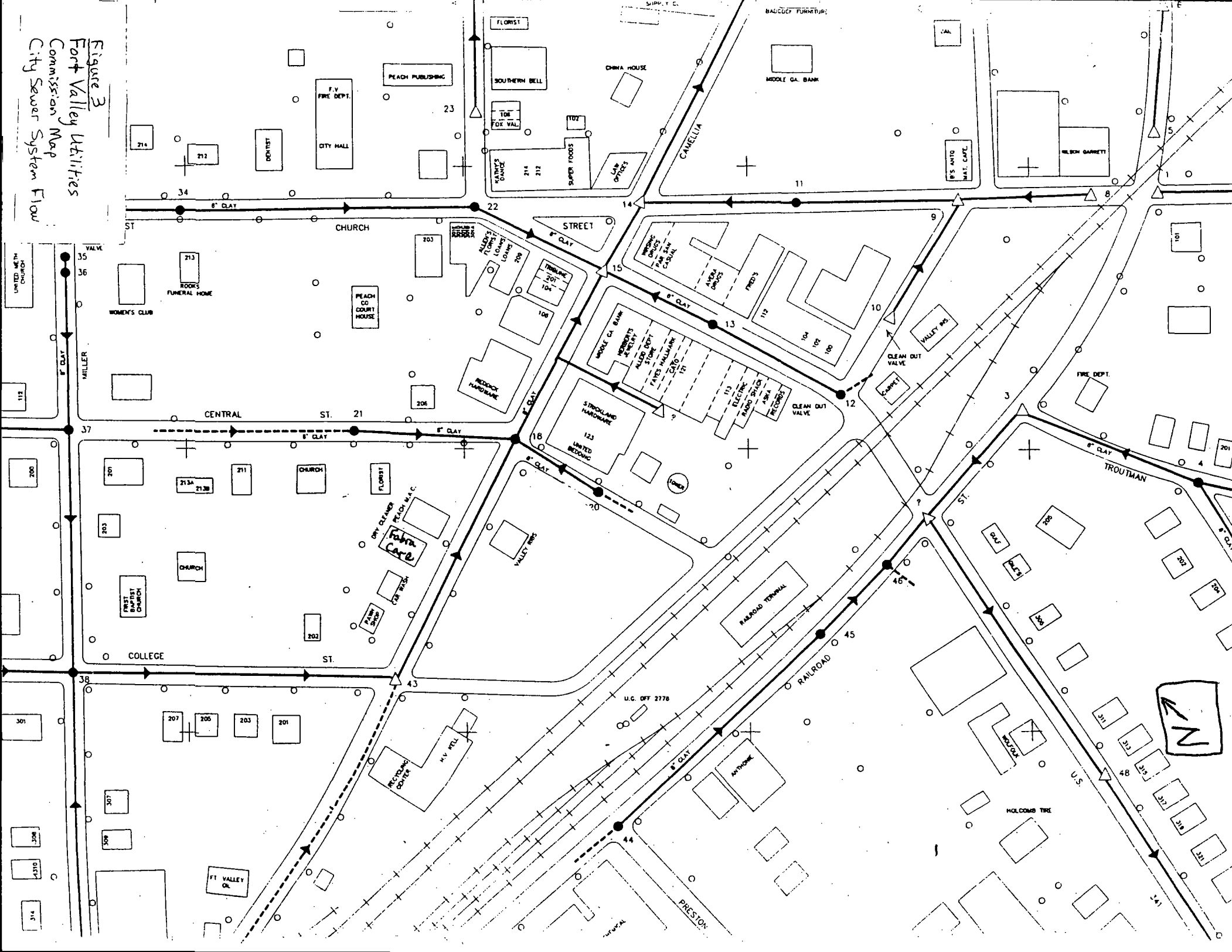
= BUSH

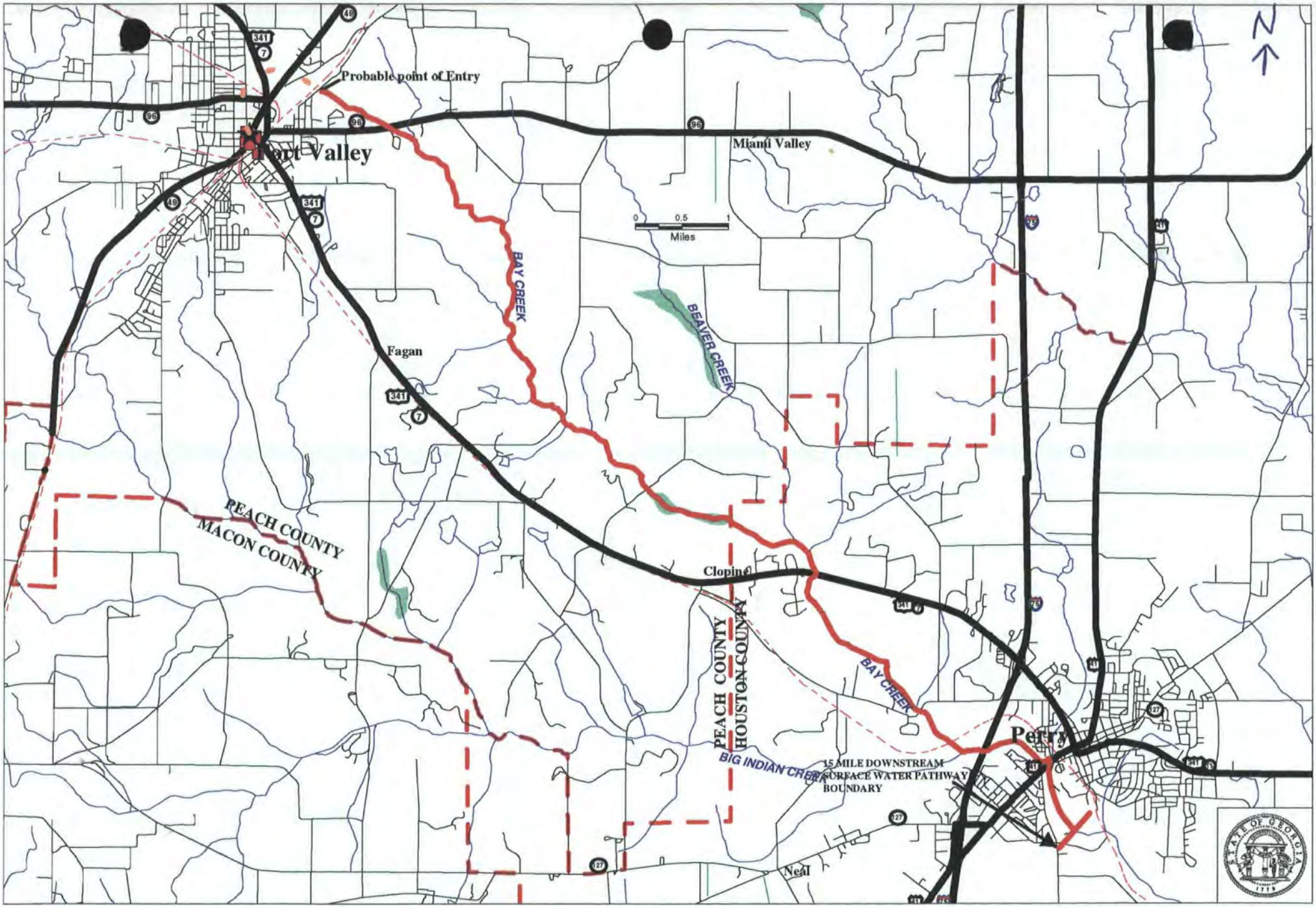
* DRAWING NOT TO SCALE

Site Layout and Sampling Locations for Fabra Care, Fort Valley, Georgia

Figure 2

Figure 3
Fort Valley Utilities
Commission Map
City Sewer System Flow






Surface Water Pathway
Hydrology
County Boundary
Projected Sur Pathway
Major Highw
Major Wetland

Site Location
City/Town
Unincorporated Town

FORT VALLEY, PEACH COUNTY
15 MILE SURFACE WATER DOWNSTREAM PATHWAY
FIG. 4

Source: 1990 Census Bureau (TIGER), US EPA (GIRAS Landuse), GA DOT (Wetlands)

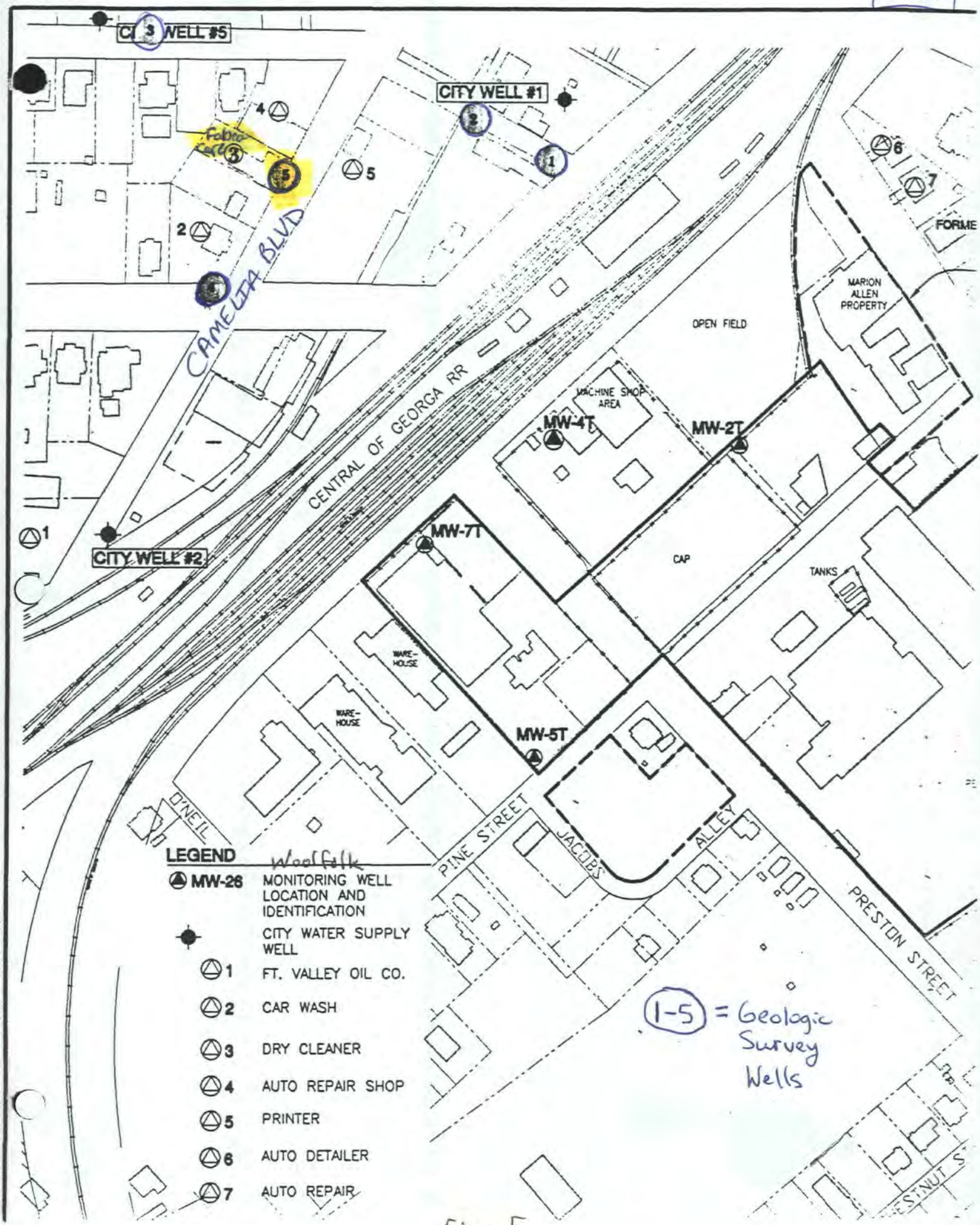

N
CITY WELL #5
CITY WELL #1
CITY WELL #2
CAMELLIA BLVD
CENTRAL OF GEORGA RR
OPEN FIELD
MARION ALLEN PROPERTY
MACHINE SHOP AREA
MW-4T
MW-2T
MW-7T
MW-5T
CAP
TANKS
WARE-HOUSE
WARE-HOUSE
O'NEIL
PINE STREET
JACOBS
ALLEY
PRESTON STREET
FORME
LEGEND
Woolfolk
MW-26 MONITORING WELL LOCATION AND IDENTIFICATION
CITY WATER SUPPLY WELL
1 FT. VALLEY OIL CO.
2 CAR WASH
3 DRY CLEANER
4 AUTO REPAIR SHOP
5 PRINTER
6 AUTO DETAILER
7 AUTO REPAIR
Fabric Care
1-5 = Geologic Survey Wells

Figure 5

# ATTACHMENT A

# ATTACHMENT B

**GEORGIA ENVIRONMENTAL PROTECTION DIVISION**
**HAZARDOUS WASTE MANAGEMENT BRANCH**

**CHAIN OF CUSTODY**

**FACILITY:** Fabracare - Fort Valley S.I. **LOCATION:** Fort Valley, Georgia

| SAMPLE # | HWMB LOG # | LAB # | DESCRIPTION | COLLECTED BY (NAME) | DATE | TIME |
|---|---|---|---|---|---|---|
| 1A | 7359 | | Hole #1 - 2 to 3 foot depth - East side of Bldg | Ann Boat | 10/29/97 | 1055 |
| 1B | 7360 | | Hole #1 - 3 to 4 foot depth - East side of Bldg | ASR | 10/29/97 | 1103 |
| 1C | 7361 | | Hole #1 - 4 to 5 foot depth - East side of Bldg | ASR | 10/29/97 | 1108 |
| 1D | 7362 | | Hole #1 - 5 to 6 foot depth - East side of Bldg | ASR | 10/29/97 | 1120 |
| 1E | 7363 | | Hole #1 - 8 to 10 foot depth - East side | ASR | 10/29/97 | 1137 |
| 2A | 7364 | | Hole #2 - 2 to 3 foot depth - North side | ASR | 10/29/97 | 1147 |
| 2B | 7365 | | Hole #2 - 3 to 4 foot depth - North side | ASR | 10/29/97 | 1154 |
| 2C | 7366 | | Hole #2 - 4 to 5 foot depth - North side | ASR | 10/29/97 | 1158 |

**TRANSFER RECORD**

| TRANSFERRED BY (NAME) | TO (NAME) (IF FINAL: LAB NAME) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (NAME) | DATE |
|---|---|---|---|---|---|---|
| Ann Boat | EPD Lab | 10/30/97 | 0930 | HAND | Mike Basmaj. | 10/30/97 |
| | | | | | | |
| | | | | | | |

**ANALYSIS REQUESTED:** Perchloroethylene - Volatiles

R:/Mitchell
Forms. Custody. FRM

GEORGIA ENVIRONMENTAL PROTECTION DIVISION
HAZARDOUS WASTE MANAGEMENT BRANCH

CHAIN OF CUSTODY

FACILITY: Fabracare - Fort Valley S.I. LOCATION: Fort Valley, Georgia

| SAMPLE # | HWMB LOG # | LAB # | DESCRIPTION | COLLECTED BY (NAME) | DATE | TIME |
|---|---|---|---|---|---|---|
| 2D | 7367 | | Hole #2, 5 to 6 foot depth, North side | CGR | 10/29/97 | 1204 |
| 2E | 7368 | | Hole #2 8 to 10 foot depth, North side | CGR | 10/29/97 | 1211 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

TRANSFER RECORD

| TRANSFERRED BY (NAME) | TO (NAME) (IF FINAL: LAB NAME) | DATE | TIME | METHOD OF TRANSFER | RECEIVED BY (NAME) | DATE |
|---|---|---|---|---|---|---|
| Amy Roof | EPD Lab | 10/30/97 | 0930 | HAND | Mike Basmaj, AA | 10/30/97 |
| | | | | | | |
| | | | | | | |

ANALYSIS REQUESTED: Perchloroethylene - volatiles

R:/Mitchell
Forms. Custody. FRM

# ATTACHMENT C

# FORT VALLEY ANALYTICAL RESULTS

Geological Survey Samples

| Sample ID | Matrix | Sampling Date | Summary of results |
|---|---|---|---|
| EPD-1a, 1' | soil | 9-22-97 | ND |
| EPD-1a, 18.3' | soil | 9-23-97 | ND |
| EPD-1a, 25' | soil | 9-23-97 | ND |
| EPD-1a, 27.5' | soil | 9-23-97 | ND |
| EPD-1a, 28.6' | soil | 9-23-97 | ND |
| EPD-1a, 30.8' | soil | 9-23-97 | ND |
| *DI-1* | *distilled water used in decon* | *9-23-97(in field)* | *ND* |
| *EQ-1* | *core barrel rinseate* | *9-23-97 (in field)* | *ND* |
| *TAP-1* | *tap water used in well constr.* | *9-23-97(in field)* | *ND* |
| *Travel Blank* | *distilled water provided by la* | *4-10-97 (in lab)* | *ND* |
| EPD-1a | groundwater | 10-1-97 | 5.37ppb toluene*, 72.7ppb acetone**, 0.9-2.09ppb chloroform*(City water leak) |
| *EQ-2* | *bailer rinseate* | *10-1-97 (in field)* | *0.93ppb toluene* |
| *Trip Blank* | *distilled H2O provided by lab* | *5-11-97(in lab)* | *1.7ppb total xylenes*, 0.68 dichlorofluoromethane*** |
| EPD-2a, 10.8' | soil | 10-7-97 | ND |
| EPD-2a, 15.5' | soil | 10-7-97 | trace toluene, 199ppb acetone (Was ND when re-sampled.) |
| EPD-2a, 23.8' | soil | 10-7-97 | trace toluene, 153ppb acetone |
| EPD-3a, 10.9' | soil | 10-8-97 | trace toluene |
| *EQ-Soil* | *core barrel rinseate* | *10-7-97 (in field)* | *ND* |
| *EQ-Soil* | *core barrel rinseate* | *10-8-97 (in field)* | *ND* |
| *Travel Blank* | *distilled water provided by la* | *4-10-97(in lab)* | *ND* |
| EPD-3a, 28.2' | soil | 10-14-97 | trace toluene, 4.6ppb(TIE)butyl acetate** |
| EPD-3a, 30.7' | soil | 10-15-97 | trace toluene |
| EPD-2a | groundwater | 10-16-97 | 0.53-0.55ppb PCE* |
| EPD-3a | groundwater | 10-16-97 | ND |
| *EQ-GW* | *bailer rinseate* | *10-16-97 (in field)* | *1.34-1.4ppb toluene* |
| *Travel Blank* | *distilled water provided by la* | *9-24-97 (in lab)* | *ND* |
| EPD-4a, 12' | soil | 10-21-97 | ND |
| EPD-4a, 16.5' | soil | 10-21-97 | ND |
| EPD-4a, 29.9' | soil | 10-21-97 | ND |
| *Travel Blank* | *distilled water provided by la* | *10-15-97 (in lab)* | *ND* |
| *EQ-Soil* | *core barrel rinseate* | *10-21-97 (in field)* | *1.42-2.0 ppb naphthalene*** |
| EPD-1a (retest) | groundwater | 10-28-97 | 2.35-2.8ppb chloroform (City water leak) |
| *EQ Rinseate* | *bailer rinseate* | *10-28-97 (in field)* | *0.85-2.2ppb naphthalene* |
| *Trip Blank* | *distilled water provided by la* | *10-24-97 (in lab)* | *ND* |
| EPD-2b, 15.5' (retest) | soil | 11-10-97 | ND |
| *Trip Blank* | *distilled water provided by la* | *10-24-97 (in lab)* | *ND* |
| *EQ-Soil* | *core barrel rinseate* | *11-10-97 (in field)* | *ND* |
| EPD-5a, 1' | soil | 1-5-98 | 109ppb acetone, trace ethylbenzene*, trace xylenes, 439ppb PCE, 8.89ppb toluene |
| EPD-5a, 4' | soil | 1-5-98 | 34.5ppb PCE |
| EPD-5a, 7.5' | soil | 1-6-98 | 126 ppb acetone, trace xylenes, trace toluene |
| EPD-5a, 10.5' | soil | 1-6-98 | 106ppb acetone |
| EPD-5a, 12.5' | soil | 1-6-98 | trace acetone, trace xylenes, trace PCE, trace toluene |
| EPD-5a, 15.5' | soil | 1-6-98 | 76ppb (TIE) 1,1-difluoroethane**; 112ppb acetone |
| EPD-5a, 17.5' | soil | 1-6-98 | 101ppb acetone |
| EPD-5a, 20.5' | soil | 1-6-98 | 138ppb acetone |
| EPD-5a, 23' | soil | 1-6-98 | ND |
| EPD-5a, 24.6' | soil | 1-6-98 | 119ppb acetone, trace xylenes, trace toluene |
| *Equipment Blank* | *core barrel rinseate* | *1-6-98 (in field)* | *316ppb (TIE) isopropyl alcohol (Used in equipment decontamination process.)* |
| *Trip Blank* | *distilled water provided by la* | *1-5-98 (in lab)* | *ND* |
| EPD-5a | groundwater | 1-16-98 | trace carbon disulfide**, trace chloroform, 169ppb cis-1,2-dichloroethene*, 5598ppb PCE, 130.2ppb trichloroethene* |
| *Equipment Blank* | *bailer rinseate* | *1-16-98 (in field)* | *ND* |
| *Travel Blank* | *distilled water provided by la* | *1-16-98 (in lab)* | *ND* |
| *EPD-1b(49' temp. well)* | *groundwater* | *1-26-98* | *157-157.8ppb(TIE) acetone (also in equipment blank)* |
| *Equipment blank* | *bailer rinseate* | *1-26-98* | *9.0-8.9ppb (TIE) acetone* |
| EPD-1b, 70.1' | soil | 1-27-98 | ND |
| EPD-1b, 73' | soil | 1-27-98 | ND |
| EPD-1b, 76.8' | soil | 1-27-98 | ND |
| EPD-1b, 88' | soil | 1-27-98 | ND |
| EPD-1b, 90' | soil | 1-27-98 | ND |
| *Equipment blank* | *core barrel rinseate* | *1-21-98 (in field)* | *39.2ppb(TIE)isopropyl alcohol (used in decontamination process), trace naphthalene* |
| *Travel Blank* | *distilled water provided by la* | *1-20-98 (in lab)* | *Sample lost by lab* |
| EPD-5b, 53' | soil | 2-25-98 | ND |
| EPD-5b, 61.5' | soil | 2-25-98 | nonanal (TIE) |
| EPD-5b, 63' | soil | 2-25-98 | trace acetone |
| *Equipment blank* | *core barrel rinseate* | *2-24-98 (in field)* | *trace naphthalene* |
| *Travel Blank* | *distilled water provided by la* | *2-20-98 (in lab0)* | *ND* |
| EPD-1b | groundwater | 3-06-98 | 2.1 ppb chloroform, 8.0 ppb cis-1,1-dichloroethene, 559 ppb PCE, 21 ppb trichloroethene |
| *Equipment Blank* | *bailer rinseate* | *3-06-98 (in field)* | *ND* |
| EPD-5b | groundwater | 3-12-98 | 177 ppb PCE |
| EPD-2b, 63' | soil | 3-18-98 | trace 2-butanone, trace acetone |
| EPD-2b, 65.5' | soil | 3-18-98 | trace 2-butanone, trace acetone |
| EPD-2b, 68' | soil | 3-18-98 | trace 2-butanone, trace acetone |
| EPD-2b, 70' | soil | 3-18-98 | trace 2-butanone, trace acetone |
| *Equipment blank* | *core barrel rinseate* | *3-18-98 (in field)* | *ND* |
| *Travel Blank* | *distilled water provided by la* | *3-18-98 (in lab)* | *ND* |

*MCLs: toluene: 1000ppb, chloroform: 100ppb, xylenes: 10000ppb, tetrachloroethylene (PCE): 5ppb, ethylbenzene: 700ppb, cis-1,2-dichloroethene: 70ppb, and trichloroethene: 5ppb.

**MCLs don't exist for: acetone, dichlorofluoromethane, butyl acetate, difluoromethane, and carbon disulfide

# REQUEST FOR LABORATORY ANALYSIS

GH

Facility Name/Location: FabraCare Cleaners - Fort Valley Site Investigation

Sample Collected By/Phone: Ann Roat - (404) 657-8673 Georgia Dept. of Natural Resources

Collection Date: ~~10/28/97~~ 10/29/97

Date Submitted To Lab: ~~10/29/97~~ 10/30/97

HWMB LOG NUMBER: 7359

*(File a separate Request Sheet for each sample point)*

AB84437 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC FABRACARE CLEANER FT VA HW7359
Sample collector: A ROAT

Analysis Needed By: Routine ____ Other (specif

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Conncentration of Organics Requested (estimated): High ____ Low ____ Other (e.g., rinse blank - specify) ____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ____ ____ ____

Special Precautions: ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

I 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

Organics Special Request: ____

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: ____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): Perchloroethylene

approximately 10 - 30 samples

Reviewed By (HWMB): CW Date: 10/3/97 Received By (EPD Lab): MCP

Approved By (HWMB): ____ Date: ____ Date (EPD Lab): 10/30/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | A ROAT | **Sample ID :** | **AB84437** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 10:59 | **Time Collected:** | 10:55 |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7359 |
| **Sample Site:** | FABRACARE CLEANER FT VA HW7359 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Acetone | 75059 | 8260 | 100 | 104 | | ug/kg | SMA | 11/04/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.2 | | ug/kg | SMA | 11/04/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | ırbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 47.9 | | ug/kg | SMA | 11/04/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |

**Sample ID : AB84437**



.AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | 67.3 | | ug/kg | SMA | 11/04/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | SMA | 11/04/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.0 | | ug/kg | SMA | 11/04/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/04/97 |

**Sample comments :**

.CHLOROETHYLENE

*End of Report*



.AMETER CODE: EPA
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

REQUEST FOR LABORATORY ANALYSIS GHL

Facility Name/Location: FabraCare Cleaners - Fort Valley Site Investigation

Sample Collected By/Phone: Ann Roat - (404) 657-8673

Collection Date: ~~10/28/97~~ on 10/29/97 Georgia Dept. of Natural Resources

Date Submitted To Lab: ~~10/29/97~~ on 10/30/97

HWMB LOG NUMBER: 7360

*(File a separate Request Sheet for each sample point)*

AB84438 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHCC FABRACARE CLEANER FT VA HW7360
Sample collector: A ROAT

Analysis Needed By: Routine ____ Other (e.g.) ____

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Conncentration of Organics Requested (estimated): High ____ Low ____ Other (e.g., rinse blank - specify) ____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ____ ____ ____

Special Precautions: ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

I 4 OZ. JARS
8 OZ. JARS
— 16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

Organics Special Request: ____

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: ____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): Perchloroethylene

approximately 10 - 30 samples

Reviewed By (HWMB): CW Date: 10/3/97 Received By (EPD Lab): [illegible]

Approved By (HWMB): ____ Date: ____ Date (EPD Lab): 10/30/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | A ROAT | **Sample ID :** | **AB84438** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 10:59 | **Time Collected:** | 11:03 |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7360 |
| **Sample Site:** | FABRACARE CLEANER FT VA HW7360 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***anics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |



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Trace: Below quantitation limits
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LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.8 | | ug/kg | SMA | 11/03/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Carbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 48.0 | | ug/kg | SMA | 11/03/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |

**Sample ID : AB84438**



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | 11.5 | | ug/kg | SMA | 11/03/97 |
| | Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.1 | | ug/kg | SMA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/03/97 |

**Sample comments :**

CHLOROETHYLENE

*End of Report*



AMETER CODE: EPA
ug/l : micrograms/liter
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

GHL

# REQUEST FOR LABORATORY ANALYSIS

Facility Name/Location: FabraCare Cleaners - Fort Valley Site Investigation

Sample Collected By/Phone: Ann Roat - 404 657-8673 Georgia Dept. of Natural Resources

Collection Date: ~~10/28/97~~ 10/29/97

Date Submitted To Lab: ~~10/29/97~~ 10/30/97

HWMB LOG NUMBER: 7361

AB84439 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC FABRACARE CLEANER FT VA HW7361
Sample collector: A ROAT

*(File a separate Request Sheet for each sample point)*

Analysis Needed By: Routine ____ Other (speci

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Conncentration of Organics Requested (estimated): High ____ Low ____ Other (e.g., rinse blank - specify) ____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ____ ____ ____

Special Precautions: ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.

### TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

T 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

Organics Special Request: ____

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: ____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

ADDITIONAL ANALYSIS REQUESTED (see list on back): Perchloroethylene
approximately 10 - 30 samples

Reviewed By (HWMB): [illegible] Date: 10/3/97 Received By (EPD Lab): [illegible]

Approved By (HWMB): ____ Date: ____ Date (EPD Lab): 10/30/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | A ROAT | **Sample ID :** | **AB84439** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 10:59 | **Time Collected:** | 11:08 |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7361 |
| **Sample Site:** | FABRACARE CLEANER FT VA HW7361 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***C nics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |



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USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

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|---|---|---|
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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | ,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.7 | | ug/kg | SMA | 11/03/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | bon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 48.2 | | ug/kg | SMA | 11/03/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |

**Sample ID : AB84439**



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | 17.0 | | ug/kg | SMA | 11/03/97 |
| | Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.5 | | ug/kg | SMA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/03/97 |

**Sample comments :**

F CHLOROETHYLENE

*End of Report*



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

GH

REQUEST FOR LABORATORY ANALYSIS

Facility Name/Location: FabraCare Cleaners - Fort Valley Site Investigation

Sample Collected By/Phone: Ann Roat - (404) 657-8673

Collection Date: ~~10/28/97~~ 10/29/97 Georgia Dept. of Natural Resources

Date Submitted To Lab: ~~10/29/97~~ 10/30/97

HWMB LOG NUMBER: 7362

*(File a separate Request Sheet for each sample point)*

AB84440 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC FABRACARE CLEANER FT VA HW7362
Sample collector: A ROAT

Analysis Needed By: Routine ____ Other (specif

Sample Description (check one)

Waste ____ Soil/Sediment X Sludge ____

Ground Water ____ Surface Water ____ Drinking Water Well ____

Conncentration of Organics Requested (estimated): High ____ Low ____ Other (e.g., rinse blank - specify) ____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ____ ____ ____

Special Precautions: ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.

### 1. TOTAL ORGANICS

Semi-Volatiles (Acid & Base/Neutral) ____

Volatiles ✓

Pesticides ____

Herbicides ____

Organophosphorous Pesticides ____

PCB ____

BETX ____

Total Petroleum Hydrocarbon ____

Organics Special Request: ____

4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

### 2. TOTAL METALS

ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____

Mercury ____

Metals Special Request: ____

### 3. TCLP ORGANICS

Volatiles ____ Pesticides ____

Semi-Volatiles (Acid & Base/Neutral) ____ Herbicides ____

Additional Specific Organics For TCLP: ____

### 4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ Additional Metals For TCLP: ____

Mercury ____

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): Perchloroethylene

approximately 10 - 30 samples

Reviewed By (HWMB): CW Date: 10/3/97 Received By (EPD Lab): MCB

Approved By (HWMB): ____ Date: ____ Date (EPD Lab): 10/30/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | A ROAT | **Sample ID :** | **AB84440** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 10:59 | **Time Collected:** | 11:20 |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7362 |
| **Sample Site:** | FABRACARE CLEANER FT VA HW7362 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***C nics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |



.AMETER CODE: EPA
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mg/l : milligrams/liter
MDL: method detection limit
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Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1 2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | ,,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Acetone | 75059 | 8260 | 100 | Trace | | ug/kg | SMA | 10/31/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.6 | | ug/kg | SMA | 10/31/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | :bon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 51.3 | | ug/kg | SMA | 10/31/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |

**Sample ID : AB84440**



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | 28.9 | | ug/kg | SMA | 10/31/97 |
| | Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | SMA | 10/31/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.2 | | ug/kg | SMA | 10/31/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 10/31/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 10/31/97 |

**Sample comments :**

CHLOROETHYLENE

*End of Report*



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

GHL

# REQUEST FOR LABORATORY ANALYSIS

Facility Name/Location: FabraCare Cleaners - Fort Valley Site Investigation

Sample Collected By/Phone: Ann Roat - (404) 657-8673

Collection Date: ~~on 10/28/97~~ 10/27/97 Georgia Dept. of Natural Resources

Date Submitted To Lab: ~~on 10/29/97~~ 10/30/97

HWMB LOG NUMBER: 7363

*(File a separate Request Sheet for each sample point)*

AB84441 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC FABRACARE CLEANER FT VA HW7363
Sample collector: A ROAT

Analysis Needed By: Routine ____ Other (spe

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Concentration of Organics Requested (estimated): High ____ Low ____ Other (e.g., rinse blank - specify) ____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ____ ____ ____

Special Precautions: ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.

### 1 TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

Organics Special Request: ____

I 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: ____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

### 5 ADDITIONAL ANALYSIS REQUESTED (see list on back): Perchloroethylene

approximately 10 - 30 samples

Reviewed By (HWMB): CW Date: 10/3/97 Received By (EPD Lab): MCB

Approved By (HWMB): ____ Date: ____ Date (EPD Lab): 10/30/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | A ROAT | **Sample ID :** | **AB84441** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 10:59 | **Time Collected:** | 11:37 |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7363 |
| **Sample Site:** | FABRACARE CLEANER FT VA HW7363 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***C nics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |



.AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 11/01/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.2 | | ug/kg | SMA | 11/01/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/01/97 |
| | bon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/01/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/01/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 48.9 | | ug/kg | SMA | 11/01/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |

**Sample ID : AB84441**



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | ethylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/01/97 |
| | butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/01/97 |
| | Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/01/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.7 | | ug/kg | SMA | 11/01/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/01/97 |

**Sample comments :**

F .CHLOROETHYLENE

*End of Report*



PARAMETER CODE: EPA
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mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

GHL

# REQUEST FOR LABORATORY ANALYSIS

Facility Name/Location: FabraCare Cleaners - Fort Valley Site Investigation

Sample Collected By/Phone: Ann Roat - (404) 657-8673

Collection Date: ~~10/28/97~~ 10/28/97 Georgia Dept. of Natural Resources

Date Submitted To Lab: ~~10/29/97~~ 10/30/97

HWMB LOG NUMBER: 7364

*(File a separate Request Sheet for each sample point)*

AB84442 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC FABRACARE CLEANER FT VA HW7364
Sample collector: A ROAT

Analysis Needed By: Routine ____ Other (specify

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Concentration of Organics Requested (estimated): High ____ Low ____ Other (e.g., rinse blank - specify) ____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ____ ____ ____

Special Precautions: ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

Organics Special Request: ____

— 4 OZ. JARS
— 8 OZ. JARS
— 16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: ____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): Perchloroethylene

approximately 10 - 30 samples

Reviewed By (HWMB): CW Date: 10/3/97 Received By (EPD Lab): MCB

Approved By (HWMB): ____ Date: ____ Date (EPD Lab): 10/30/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | A ROAT | **Sample ID :** | **AB84442** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 10:59 | **Time Collected:** | 11:47 |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7364 |
| **Sample Site:** | FABRACARE CLEANER FT VA HW7364 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***( ɜnics*** | ***EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |



‹AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
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LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Acetone | 75059 | 8260 | 100 | Trace | | ug/kg | SMA | 11/01/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 43.8 | | ug/kg | SMA | 11/01/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/01/97 |
| | rbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/01/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 50.8 | | ug/kg | SMA | 11/01/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |

**Sample ID : AB84442**



.RAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
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LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | sec-Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | 945 | | ug/kg | SMA | 11/01/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | SMA | 11/01/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 48.5 | | ug/kg | SMA | 11/01/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Trichloroethene | 34487 | 8260 | 5 | 10.9 | | ug/kg | SMA | 11/01/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/01/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/01/97 |

**Sample comments :**

F CHLOROETHYLENE

*End of Report*



PARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
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LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# REQUEST FOR LABORATORY ANALYSIS

~~GHI~~

Facility Name/Location: FabraCare Cleaners - Fort Valley Site Investigation

Sample Collected By/Phone: Ann Roat - 404 657-8673

Collection Date: ~~10/28/97~~ 10/29/97

Date Submitted To Lab: ~~10/29/97~~ 10/30/97

HWMB LOG NUMBER: 7365

*(File a separate Request Sheet for each sample point)*

Georgia Dept. of Natural Resources

AB84443 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC FABRACARE CLEANER FT VA HW7365
Sample collector: A ROAT

Analysis Needed By: Routine ____ Other (specify)

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Conncentration of Organics Requested (estimated): High ____ Low ____ Other (e.g., rinse blank - specify) ____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ____ ____ ____

Special Precautions: ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

Organics Special Request: ____

I 4 OZ. JARS
8 OZ. JARS
— 16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: ____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

ADDITIONAL ANALYSIS REQUESTED (see list on back): Perchloroethylene
approximately 10 - 30 samples

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | CAD | Date: | 10/3/97 | Received By (EPD Lab): | MLB |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/30/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

# LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | A ROAT | **Sample ID :** | **AB84443** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 10:59 | **Time Collected:** | 11:54 |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7365 |
| **Sample Site:** | FABRACARE CLEANER FT VA HW7365 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ( | ***ınics EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |



.AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.4 | | ug/kg | SMA | 11/03/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | rbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 48.6 | | ug/kg | SMA | 11/03/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |

**Sample ID : AB84443**



.AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
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USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
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| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | 44.0 | | ug/kg | SMA | 11/03/97 |
| | Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.8 | | ug/kg | SMA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/03/97 |

**Sample comments :**

CHLOROETHYLENE

*End of Report*



PARAMETER CODE: EPA
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|---|---|---|
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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

REQUEST FOR LABORATORY ANALYSIS

GHL

Facility Name/Location: FabraCare Cleaners - Fort Valley Site Investigation

Sample Collected By/Phone: Ann Roat - (404) 657-8673

Collection Date: ~~10/28/97~~ 10/29/97

Date Submitted To Lab: ~~10/29/97~~ 10/30/97

HWMB LOG NUMBER: 7366

*(File a separate Reqest Sheet for each sample point)*

Georgia Dept. of Natural Resources

AB84444 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC FABRACARE CLEANER FT VA HW7366
Sample collector: A ROAT

Analysis Needed By: Routine ____ Other (spec

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Conncentration of Organics Requested (estimated): High ____ Low ____ Other (e.g., rinse blank - specify) ____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ____ ____ ____

Special Precautions: ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

Organics Special Request: ____

1 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: ____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): Perchloroethylene

approximately 10 - 30 samples

Reviewed By (HWMB): CW Date: 10/3/97 Received By (EPD Lab): MCB

Approved By (HWMB): ____ Date: ____ Date (EPD Lab): 10/30/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | A ROAT | **Sample ID :** | **AB84444** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 10:59 | **Time Collected:** | 11:58 |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7366 |
| **Sample Site:** | FABRACARE CLEANER FT VA HW7366 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ***( ɜnics EPA Method 8260 Soil*** | | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |



.AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
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**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | ,3,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.2 | | ug/kg | SMA | 11/03/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | rbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 48.7 | | ug/kg | SMA | 11/03/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |

**Sample ID : AB84444**



AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
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LSPEC: Lower than specification limits

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| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | 9.46 | | ug/kg | SMA | 11/03/97 |
| | Toluene | 34483 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.9 | | ug/kg | SMA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/03/97 |

**Sample comments :**

.CHLOROETHYLENE

*End of Report*



.ARAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
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HAZARDOUS WASTE MANAGEMENT BRANCH (HWMB)

# REQUEST FOR LABORATORY ANALYSIS

Facility Name/Location: FabraCare Cleaners - Fort Valley Site Investigation

Sample Collected By/Phone: Ann Roat - (404) 657-8673

Collection Date: ~~10/28/97~~ 10/29/97 Georgia Dept. of Natural Resources

Date Submitted To Lab: ~~10/29/97~~ 10/30/97

HWMB LOG NUMBER: 7367

*(File a separate Request Sheet for each sample point)*

AB84445 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC FABRACARE CLEANER FT VA HW7367
Sample collector: A ROAT

Analysis Needed By: Routine ____ Other (specify

Sample Description (check one)

Waste ____ Soil/Sediment X Sludge ____

Ground Water ____ Surface Water ____ Drinking Water Well ____

Conncentration of Organics Requested (estimated): High ____ Low ____ Other (e.g., rinse blank - specify) ____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ____ ____ ____

Special Precautions: ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.

### TOTAL ORGANICS

Semi-Volatiles (Acid & Base/Neutral) ____

Volatiles ✓

Pesticides ____

Herbicides ____

Organophosphorous Pesticides ____

PCB ____

BETX ____

Total Petroleum Hydrocarbon ____

Organics Special Request: ____

I 4 OZ. JARS
8 OZ. JARS
16 OZ. JARS

### 2. TOTAL METALS

ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____

Mercury ____

Metals Special Request: ____

### 3. TCLP ORGANICS

Volatiles ____ Pesticides ____

Semi-Volatiles (Acid & Base/Neutral) ____ Herbicides ____

Additional Specific Organics For TCLP: ____

### 4. TCLP METALS ANALYSIS

TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) ____ Additional Metals For TCLP: ____

Mercury ____

### 5. ADDITIONAL ANALYSIS REQUESTED (see list on back): Perchloroethylene

approximately 10 - 30 samples

Reviewed By (HWMB): CW Date: 10/3/97 Received By (EPD Lab): MCB

Approved By (HWMB): ____ Date: ____ Date (EPD Lab): 10/30/97

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | A ROAT | **Sample ID :** | **AB84445** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 10:59 | **Time Collected:** | 12:04 |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7367 |
| **Sample Site:** | FABRACARE CLEANER FT VA HW7367 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ( | ***ınics EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/04/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |



.RAMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | ,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 11/04/97 |
| | Acetone | 75059 | 8260 | 100 | 171 | | ug/kg | SMA | 11/04/97 |
| | Benzene | 34237 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/04/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.4 | | ug/kg | SMA | 11/04/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | rbon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/04/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/04/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 46.7 | | ug/kg | SMA | 11/04/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |

**Sample ID : AB84445**



.AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/04/97 |
| | Butylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | SMA | 11/04/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 46.9 | | ug/kg | SMA | 11/04/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/04/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/04/97 |

**Sample comments :**

CHLOROETHYLENE

*End of Report*



AMETER CODE: EPA
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mg/l : milligrams/liter
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**Laboratory Contacts:**

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|---|---|---|
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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

GHL

# REQUEST FOR LABORATORY ANALYSIS

Facility Name/Location: FabraCare Cleaners - Fort Valley Site Investigation

Sample Collected By/Phone: Ann Roat - (404) 657-8673

Collection Date: ~~10/28/97~~ 10/29/97 Georgia Dept. of Natural Resources

Date Submitted To Lab: ~~10/29/97~~ 10/30/97

HWMB LOG NUMBER: 7368

*(File a separate Reqest Sheet for each sample point)*

AB84446 Due date: 11/26/97
Date submitted: 10/30/97
sourceID: ADHOC FABRACARE CLEANER FT VA HW7368
Sample collector: A ROAT

Analysis Needed By: Routine ____ Other (specif

Sample Description (check one)

| | | | | | |
|---|---|---|---|---|---|
| Waste | ____ | Soil/Sediment | X | Sludge | ____ |
| Ground Water | ____ | Surface Water | ____ | Drinking Water Well | ____ |

Conncentration of Organics Requested (estimated): High ____ Low ____ Other (e.g., rinse blank - specify) ____

Describe Sample Including Source And Known Properties (e.g., pH, concentration):

Applicable Hazardous Waste Codes (if known) ____ ____ ____

Special Precautions: ____

## ANALYSIS REQUIRED

(Note: Totals will always be run first. A TCLP will subsequently be run only if the total value indicates a positive TCLP could result.

### 1. TOTAL ORGANICS

| | |
|---|---|
| Semi-Volatiles (Acid & Base/Neutral) | ____ |
| Volatiles | ✓ |
| Pesticides | ____ |
| Herbicides | ____ |
| Organophosphorous Pesticides | ____ |
| PCB | ____ |
| BETX | ____ |
| Total Petroleum Hydrocarbon | ____ |

I 4 OZ. JARS
8 OZ. JARS
— 16 OZ. JARS

Organics Special Request: ____

### 2. TOTAL METALS

| | |
|---|---|
| ICP Metals Scan (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ |
| Mercury | ____ |
| Metals Special Request: | ____ |

### 3. TCLP ORGANICS

| | | | |
|---|---|---|---|
| Volatiles | ____ | Pesticides | ____ |
| Semi-Volatiles (Acid & Base/Neutral) | ____ | Herbicides | ____ |

Additional Specific Organics For TCLP: ____

### 4. TCLP METALS ANALYSIS

| | | | |
|---|---|---|---|
| TCLP Metals (Ag, As, Ba, Cd, Cr, Ni, Pb, Se) | ____ | Additional Metals For TCLP: | ____ |
| Mercury | ____ | | |

5. ADDITIONAL ANALYSIS REQUESTED (see list on back): Perchloroethylene
approximately 10 - 30 samples

| | | | | | |
|---|---|---|---|---|---|
| Reviewed By (HWMB): | CW | Date: | 10/3/97 | Received By (EPD Lab): | MLB |
| Approved By (HWMB): | ____ | Date: | ____ | Date (EPD Lab): | 10/30/97 |

# GEORGIA DEPARTMENT OF NATURAL RESOURCES
## ENVIRONMENTAL PROTECTION DIVISION

*455 14th Street NW, Atlanta, GA 30318-7900*
(404) 206-5269

**Hazardous Waste Management Program**

## LABORATORY REPORT

**TO:**

| | | | |
|---|---|---|---|
| **Sample Collector:** | A ROAT | **Sample ID :** | **AB84446** |
| **Date Received:** | 10/30/97 | **Date Collected:** | 10/28/97 |
| **Time Received:** | 10:59 | **Time Collected:** | 12:11 |
| **Reporting Date:** | 11/12/97 | **DNR Lab Reference:** | HW7368 |
| **Sample Site:** | FABRACARE CLEANER FT VA HW7368 | | |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| ( | ***nics EPA Method 8260 Soil*** | | | | | | | | |
| | 1,1,1,2-Tetrachloroethane | | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,1-Trichloroethane | 34509 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2,2-Tetrachloroethane | 34519 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1,2-Trichloroethane | 34514 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethane | 34499 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloroethene | 34504 | 8260 | 5 | Trace | | ug/kg | SMA | 11/03/97 |
| | 1,1-Dichloropropene | 77168 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichlorobenzene | 77613 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,3-Trichloropropane | 78490 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trichlorobenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2,4-Trimethylbenzene | 34554 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromo-3-chloropropan | 38487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dibromoethane | 79749 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichlorobenzene | 34539 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,2-Dichloroethane | 34534 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |



. .AMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | 1,2-Dichloropropane | 34544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | ,5-Trimethylbenzene | 77226 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichlorobenzene | 34569 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,3-Dichloropropane | 77173 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 1,4-Dichlorobenzene | 34574 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2,2-Dichloropropane | 77170 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Butanone | 75078 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chloroethyl vinyl ether | 34579 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Chlorotoluene | 77225 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 2-Hexanone | 75166 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Chlorotoluene | 77277 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | 4-Methyl-2-Pentanone | 75169 | 8260 | 50 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Acetone | 75059 | 8260 | 100 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Benzene | 34237 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromobenzene | 78491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromochloromethane | 77297 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromodichloromethane | 34330 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromofluorobenzene(Surrogate QC Std.) | | 8260 | -0- | 45.5 | | ug/kg | SMA | 11/03/97 |
| | Bromoform | 34290 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Bromomethane | 34416 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | ·bon Disulfide | 78544 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Carbon Tetrachloride | 34299 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | Chlorobenzene | 34304 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroethane | 34314 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloroform | 34318 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Chloromethane | 34421 | 8260 | 10 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,2-Dichloroethene | 77093 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | cis-1,3-Dichloropropene | 34702 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromochloromethane | 34309 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dibromofluoromethane(Surrogate QC Std.) | | 8260 | -0- | 49.7 | | ug/kg | SMA | 11/03/97 |
| | Dibromomethane | 78756 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Dichlorodifluoromethane | 34334 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Ethylbenzene | 34374 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Hexachlorobutadiene | 39705 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Iodomethane | 73121 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Isopropylbenzene | 77223 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |

**Sample ID : AB84446**



ᴬMETER CODE: EPA
ug/l : micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits

**Laboratory Contacts:**

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|---|---|---|
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| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

| LAB | ANALYTE | PARAMETER CODE | EPA METHOD | MDL | RESULT | NOTE | UNITS | ANALYST | ANALYSIS DATE |
|---|---|---|---|---|---|---|---|---|---|
| | Methylene Chloride | 34426 | 8260 | 5 | Not Detected | | ug/kg | SMA | 11/03/97 |
| | ·utylbenzene | 77342 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | n-Propylbenzene | 77224 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Naphthalene | 34445 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | o-Xylene | 78362 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p,m-Xylene | 45510 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | p-Isopropyltoluene | 77356 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | sec-Butylbenzene | 77350 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Styrene | 75192 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | tert-Butylbenzene | 77353 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Tetrachloroethene | 34478 | 8260 | 5 | 5.22 | | ug/kg | SMA | 11/03/97 |
| | Toluene | 34483 | 8260 | 5 | Trace | | ug/kg | SMA | 11/03/97 |
| | Toluene-d8(Surrogate QC Std.) | | 8260 | -0- | 47.2 | | ug/kg | SMA | 11/03/97 |
| | trans-1,2-Dichloroethene | 34549 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | trans-1,3-Dichloropropene | 34697 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichloroethene | 34487 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Trichlorofluoromethane | 34491 | 8260 | 5 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Acetate | 78498 | 8260 | 50 | Not detected | | ug/kg | SMA | 11/03/97 |
| | Vinyl Chloride | 34495 | 8260 | 2 | Not detected | | ug/kg | SMA | 11/03/97 |

**Sample comments :**

PERCHLOROETHYLENE

*End of Report*



METER CODE: EPA
micrograms/liter
mg/l : milligrams/liter
MDL: method detection limit
TIE: Tentatively identified/Estmated value
Trace: Below quantitation limits
USPEC: Greater than specification limits
LSPEC: Lower than specification limits


**Laboratory Contacts:**

| | | |
|---|---|---|
| Inorganics: | Pat Sammons | Ext. 5239 |
| Metals : | Harjinder Ghuman | Ext. 5223 |
| Organics: | Danny Reed | Ext. 5252 |
| GC Mass Spec: | Steve Bryan | Ext. 5260 |

# ATTACHMENT D

**FROST ASSOCIATES**

88 Founders Village, Clinton, CT 06426
(860) 669-5859 FAX (860) 669-5859

September 16, 1997

To: Environmental Protection Division
205 Butler St., Floyd Towers East, Suite 1154
Atlanta, GA 30334

Attn: James Ussery

Fr: Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Fabra Care Cleaners
Fort Valley, GA

CERCLIS:

Job:

Site Longitude: 83-53-15.5 83.887642
ite Latitude : 32-33-08 32.552219

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-1A files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the in-
ıded Block Groups. Boundary records are then sorted in adjacent side order to
termine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adjacent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)}

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 populu tion and house count extracted from the Census Bureau's 1990 STF-1A files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

Fabra Care Cleaners
Fort Valley, GA

| No. | City | Block Group ID | Blk Grp People | House Holds | Public Water | Drilled Wells | Dug Wells | Other |
|---|---|---|---|---|---|---|---|---|
| 1 | Zenith | 13079 0702 3 | 1021 | 358 | 35 | 298 | 42 | 0 |
| 2 | Marshallville | 13193 9801 1 | 889 | 327 | 245 | 66 | 28 | 0 |
| 3 | Marshallville | 13193 9801 2 | 1119 | 369 | 303 | 44 | 24 | 0 |
| 4 | Fort Valley | 13225 0402 1 | 1930 | 718 | 453 | 194 | 19 | 0 |
| 5 | Fort Valley | 13225 0402 2 | 1842 | 600 | 476 | 85 | 23 | 10 |
| 6 | Fort Valley | 13225 0404 1 | 4415 | 1258 | 1275 | 36 | 0 | 0 |
| 7 | Fort Valley | 13225 0404 2 | 1160 | 456 | 435 | 28 | 0 | 0 |
| 8 | Fort Valley | 13225 0404 3 | 132 | 49 | 4 | 24 | 4 | 0 |
| 9 | Fort Valley | 13225 0403011 | 2434 | 888 | 744 | 100 | 52 | 0 |
| 10 | Fort Valley | 13225 0403012 | 267 | 136 | 122 | 0 | 0 | 0 |
| 11 | Fort Valley | 13225 0403013 | 74 | 25 | 11 | 16 | 0 | 0 |
| 12 | Fort Valley | 13225 0403021 | 1773 | 728 | 702 | 45 | 0 | 0 |
| | Totals: | | 17056 | 5912 | 4805 | 936 | 192 | 10 |

Fabra Care Cleaners
Fort Valley, GA

| City | Census Tract ID | Tract People | House Count | Public Water | Drilled Wells | Dug Wells | Other Sources |
|---|---|---|---|---|---|---|---|
| Fort Valley | 13225 0404 2 | 1160 | 456 | 435 | 28 | 0 | 0 |
| Fort Valley | 13225 0404 3 | 132 | 49 | 4 | 24 | 4 | 0 |
| Fort Valley | 13225 0403011 | 2434 | 888 | 744 | 100 | 52 | 0 |
| Fort Valley | 13225 0402 1 | 1930 | 718 | 453 | 194 | 19 | 0 |
| Fort Valley | 13225 0402 2 | 1842 | 600 | 476 | 85 | 23 | 10 |
| Fort Valley | 13225 0404 1 | 4415 | 1258 | 1275 | 36 | 0 | 0 |
| Fort Valley | 13225 0403012 | 267 | 136 | 122 | 0 | 0 | 0 |
| Fort Valley | 13225 0403013 | 74 | 25 | 11 | 16 | 0 | 0 |
| Fort Valley | 13225 0403021 | 1773 | 728 | 702 | 45 | 0 | 0 |
| | Sub Totals: | 14027 | 4858 | 4222 | 528 | 98 | 10 |
| Marshallville | 13193 9801 1 | 889 | 327 | 245 | 66 | 28 | 0 |
| Marshallville | 13193 9801 2 | 1119 | 369 | 303 | 44 | 24 | 0 |
| | Sub Totals: | 2008 | 696 | 548 | 110 | 52 | 0 |
| Zenith | 13079 0702 3 | 1021 | 358 | 35 | 298 | 42 | 0 |
| | Sub Totals: | 1021 | 358 | 35 | 298 | 42 | 0 |

Fabra Care Cleaners
Fort Valley, GA

For Radius of 4 Mi., Circle Area = 50.265482

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 1 | Zenith | 13079 7023 | 54.974030 | 3.911922 | 7.12 |
| 2 | Marshallville | 13193 98011 | 32.482395 | 0.071163 | 0.22 |
| 3 | Marshallville | 13193 98012 | 44.204327 | 0.232980 | 0.53 |
| 4 | Fort Valley | 13225 4021 | 23.838928 | 9.110622 | 38.22 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 8.647540 | 34.26 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 6.760180 | 44.74 |
| 7 | Fort Valley | 13225 4042 | 3.236877 | 2.526381 | 78.05 |
| 8 | Fort Valley | 13225 4043 | 10.538761 | 0.837377 | 7.95 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 10.406000 | 92.17 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.132096 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533354 | 0.533354 | 100.00 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 7.095866 | 90.88 |
| | Totals: | | 229.388809 | 50.265484 | |

For Radius of 3 Mi., Circle Area = 28.274334

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 4.625260 | 19.40 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 5.102531 | 20.22 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 4.087371 | 27.05 |
| 7 | Fort Valley | 13225 4042 | 3.236877 | 1.235329 | 38.16 |
| 8 | Fort Valley | 13225 4043 | 10.538761 | 0.068782 | 0.65 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 7.687730 | 68.09 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.132096 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533354 | 0.533354 | 100.00 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 4.801882 | 61.50 |
| | Totals: | | 97.728050 | 28.274334 | |

For Radius of 2 Mi., Circle Area = 12.566371

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 1.856596 | 7.79 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 2.323050 | 9.20 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 2.179006 | 14.42 |
| 7 | Fort Valley | 13225 4042 | 3.236877 | 0.279146 | 8.62 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 3.111732 | 27.56 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.132096 | 100.00 |
| 11 | Fort Valley | 13225 403013 | 0.533354 | 0.182136 | 34.15 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 2.502609 | 32.05 |
| | Totals: | | 87.189293 | 12.566371 | |

Fabra Care Cleaners
Fort Valley, GA

For Radius of 1 Mi., Circle Area = 3.141593

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 0.484847 | 2.03 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 0.901876 | 3.57 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 0.755243 | 5.00 |
| 9 | Fort Valley | 13225 403011 | 11.290170 | 0.359703 | 3.19 |
| 10 | Fort Valley | 13225 403012 | 0.132096 | 0.129773 | 98.24 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 0.510150 | 6.53 |
| | Totals: | | 83.419060 | 3.141593 | |

For Radius of .5 Mi., Circle Area = 0.785398

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 4 | Fort Valley | 13225 4021 | 23.838928 | 0.133213 | 0.56 |
| 5 | Fort Valley | 13225 4022 | 25.240259 | 0.235778 | 0.93 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 0.221664 | 1.47 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 0.194744 | 2.49 |
| | Totals: | | 71.996796 | 0.785398 | |

For Radius of .25 Mi., Circle Area = 0.196350

| No. | City | Block Group ID | Total Area | Partial Area | % Within Radius |
|---|---|---|---|---|---|
| 5 | Fort Valley | 13225 4022 | 25.240259 | 0.084988 | 0.34 |
| 6 | Fort Valley | 13225 403021 | 15.109459 | 0.037955 | 0.25 |
| 12 | Fort Valley | 13225 4041 | 7.808152 | 0.073407 | 0.94 |
| | Totals: | | 48.157867 | 0.196350 | |

Fabra Care Cleaners
Fort Valley, GA

========== Site Data ==========

| | |
|---|---|
| Population: | 9754.95 |
| Households: | 3316.32 |
| Drilled Wells: | 309.62 |
| Dug Wells: | 66.56 |
| Other Water Sources: | 3.43 |

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

| | |
|---|---|
| Population: | 3371.40 |
| Households: | 1145.12 |
| Drilled Wells: | 125.55 |
| Dug Wells: | 22.79 |
| Other Water Sources: | 1.40 |

** Population On Private Wells: 436.75

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

| | |
|---|---|
| Population: | 3329.80 |
| Households: | 1123.25 |
| Drilled Wells: | 107.67 |
| Dug Wells: | 25.84 |
| Other Water Sources: | 1.10 |

* Population On Private Wells: 395.79

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

| | |
|---|---|
| Population: | 2231.75 |
| Households: | 731.42 |
| Drilled Wells: | 61.63 |
| Dug Wells: | 15.06 |
| Other Water Sources: | 0.56 |

** Population On Private Wells: 234.01

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

| | |
|---|---|
| Population: | 657.88 |
| Households: | 264.85 |
| Drilled Wells: | 11.33 |
| Dug Wells: | 2.54 |
| Other Water Sources: | 0.26 |

** Population On Private Wells: 34.47

Fabra Care Cleaners
Fort Valley, GA

--- Within Ring: .5 Mile(s) and .25 Mile(s) ----

| | |
|---|---|
| Population: | 111.95 |
| Households: | 36.00 |
| Drilled Wells: | 2.70 |
| Dug Wells: | 0.24 |
| Other Water Sources: | 0.06 |

** Population On Private Wells: 9.15

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

| | |
|---|---|
| Population: | 52.16 |
| Households: | 15.68 |
| Drilled Wells: | 0.74 |
| Dug Wells: | 0.08 |
| Other Water Sources: | 0.03 |

** Population On Private Wells: 2.71

** Total Population On Private Wells: 1112.89

# ATTACHMENT E

# SITE INSPECTION SAMPLING AND ANALYSIS PLAN

## FABRACARE CLEANERS
## 204 SOUTH CAMELIA BOULEVARD
## FORT VALLEY, GEORGIA 31030

September 30, 1997

Prepared By:

**Georgia Department of Natural Resources**
**Environmental Protection Division**
**Hazardous Waste Management Branch**

Prepared By:
Ann Roat
Ann Roat
Environmental Specialist

Approved By:
Charles D. Williams
Derrick Williams
Unit Coordinator

TABLE OF CONTENTS

**SECTION NUMBER** ..... **PAGE**

1. INTRODUCTION ..... 3

2. SITE DESCRIPTION ..... 3

   2.1 Location ..... 3
   2.2 Site Description ..... 3
   2.3 Operational History and Waste Characteristics ..... 3

3. COLLECTION OF NON-SAMPLING DATA ..... 4

4. SAMPLING ACTIVITIES ..... 4

   4.1 Source/Soil Sampling ..... 4
   4.2 Ground Water Sampling ..... 4
   4.3 Quality Assurance/Quality Control Procedures ..... 5
   4.4 Field Activities ..... 5

5. INVESTIGATION DERIVED WASTES PLAN ..... 5

6. PROJECT MANAGEMENT ..... 5

   6.1 Field Equipment/Health and Safety ..... 5
   6.2 Community Relations ..... 5
   6.3 Project Schedule ..... 5

REFERENCES ..... 6

LIST OF TABLE AND FIGURES:

Table 1: Sample locations ..... 6

Figure 1: Site Map ..... 7

Figure 2: Site Layout and Proposed Sampling Map - Locations ..... 8

APPENDICES:

Appendix A: Equipment List ..... 9

Appendix B: Site Safety Plan ..... 10

## 1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Reauthorization Act of 1986 (SARA), the Georgia Department of Natural Resources, Environmental Protection Division, Hazardous Waste Management Branch will conduct a site investigation (SI) at Fabra Care Cleaners in Peach County, Georgia. The scope of this investigation will include the sampling of the subsurface soil to investigate the possible migration of hazardous substances from the site to the groundwater supply.

## 2.0 SITE DESCRIPTION, OPERATIONAL HISTORY AND WASTE CHARACTERISTICS

### 2.1 Location

Fabra Care Cleaners is located off of South Camelia Boulevard in Peach County, Fort Valley, Georgia. The geographical coordinates are 32° 33' 08.0" north latitude and 83° 53' 15.5" west longitude as shown ine Figure 1.

To get to the site from Atlanta, take I-75 South through Macon. Exit SR 96 to the right, in Peach County. Fort Valley is approximately 10 miles east of I-75 on SR 96. The site is located at 204 South Camelia Boulevard, just north of College Street in downtown Fort Valley.

The warm and humid climate of Peach County is characterized by long, hot summers and short, mild winters. The average rainfall is about 48 inches per year. March and July, normally the wettest months, each average more than five inches of rainfall. Fall is the driest part of the year, but no month has an average of less than two inches of rainfall (Soil Survey, 1967) (Reference 1).

### 2.2 Site Description

The site is located on .22of an acre of land in Peach County, Fort Valley, Georgia. Perchloroethylene (PCE) has been identified above detection limits in the Fort Valley Municipal Water Supply Wells 1 (located on Central Avenue, behind the water treatment plant, near the intersection of Railroad St.) and 2 (located on N. Camelia Boulevard {Route 49} near the intersection of Miller Street and the railroad crossing) . The Fabra Care Cleaners dry cleaning facility is located approximately 500 feet from Well 1 and 600 feet from Well 2.

### 2.3 Operational History and Waste Characteristics

According to the manager, this dry cleaner has been operating since 1967 and does currently use PCE. A new dry cleaning machine was installed in February and a concrete walled boundary was built around the machine. The previous machine was in the same location, situated directly on the concrete floor with no barrier surrounding it. The PCE is presently being reused after being filtered utilizing a refrigeration process. The spent filters are then placed in metal cans that are stored inside the facility, and shipped off monthly to MCF Systems of Atlanta for treatment. It is not known if the waste dry cleaning fluids were released in the past from

the area around the previous machine or anywhere outside the facility.

## 3.0 COLLECTION OF NON-SAMPLING DATA

Non-sampling data collection activities will include verifying population and environmental information as well as obtaining new information. A reconnaissance survey, performed on August 28, 1997, confirmed the location of two off-site city wells and various site features. Additional data will be gathered as necessary.

## 4.0 SAMPLING ACTIVITIES

The objectives of the SI are to collect analytical data used to identify hazardous substances at the site, to investigate whether hazardous substances have been released to the environment, and to ascertain if any releases have impacted human health and the environment. The proposed sampling plan calls for soil sampling. Table 1 describes the sample locations and they are presented in Figure 2.

### 4.1 Source/Soil Sampling

According to the Preliminary Assessment, the two municipal wells, in close proximity to this site, are contaminated with PCE. The Preliminary Assessment hypothesis is that there are 5 other sites who are potential sources of contamination in addition to this site. PCE might have been released from any of these businesses who had used it in their processes in the past. The samples will be collected using an on-site GeoProbe truck to sample the subsurface soil. These are the following proposed sampling locations for Fabra Care Cleaners:

1.) At the northeast side of the property, next to the east wall of the facility, collect a subsurface soil sample from under the concrete parking lot.**(sample #1)**

2.) At the back side of the property, at the northwest corner of the building, next to the north wall, collect a subsurface soil sample from under the concrete parking lot. **(sample #2)**

3.) Information about the area downgradient of the site will be obtained from the sampling results of other potential sources undergoing concurrent site investigation.

### 4.2 Ground Water Sampling

According to the Preliminary Assessment (Ref. 2-3), groundwater on-site has been impacted and sampling is planned by the Geologic Survey Branch (GSB). The GSB is planning on installing five monitoring wells in this area and the groundwater will be sampled and analyzed at that time. In addition, if groundwater is reached while sampling the subsurface soil, then it will then be sampled at that time. Any results found will then be utilized in determining the source of the PCE contamination.

### 4.3 Quality Assurance/Quality Control Procedures (QA/QC)

All sample collection, preservation and chain of custody procedures utilized during sampling activities will be in accordance with the standard operating guidelines specified in the U.S. EPA Environmental Compliance Branch SOP/QA Manual (2/1/91) sections 3 and 4. All on-site environmental media samples will

Compliance Branch SOP/QA Manual (2/1/91) sections 3 and 4. All on-site environmental media samples will be collected with dedicated sampling equipment. No decontamination of sampling equipment will be necessary between samples. New equipment will be used for each of the samples. One trip blank will be taken. All samples will be stored in coolers on ice until they reach the laboratory. Chain of custody will be maintained by the project manager until samples are hand delivered to the GAEPD laboratory located in Atlanta, Georgia.

### 4.4 Field Activities

The project managers and project geologists are scheduled to travel to the site and sample during a two-week time period at the end of October and the beginning of November1997. Soil samples will be taken in 8 oz containers.

## 5.0 INVESTIGATION DERIVED WASTES

Investigation derived wastes include personal protective equipment, disposable sampling equipment, and soil not collected as a sample. Reusable personal protective equipment will be decontaminated. All disposable personal protective and sampling equipment will be double-bagged and deposited off site at the EPD Laboratory. Soil not collected as a sample will be returned to the ground at the sample point.

## 6.0 PROJECT MANAGEMENT

The project manager for the Fort Valley Site Investigations, Ann Roat, will schedule field activities and personnel requirements, verify site access authority, and direct/oversee all field tasks. The project manager will also document and manage all collected samples. Collection of samples will be performed by the environmental specialist, Ann Roat and by additional EPD associates who make up the Site Investigation team that will be conducting these investigations .

### 6.1 Field Equipment

Ambient air safety monitoring equipment will be an Hnu meter. If volatile contaminants are detected and/or air-borne dust levels increase significantly, sampling will continue at Level C.. Environmental media sampling activities will be conducted in level D personal protection equipment including disposable gloves, work boots, and regular cotton work clothes. Other items required for this investigation, including sampling equipment, are included in Appendix A: Equipment List.

### 6.2 Project Schedule

The project is expected to start in early August, 1997and end by December, 1997. Non-sampling data collection will begin in August and continue through September, 1997.
The SI field work will take place the week of October 27-31 1997. When the field activities are completed, preparation of the draft SI narrative report will begin. Analytical results will be reviewed when received , and the final SI report will be completed as soon as possible.

## REFERENCES


1. CH2M Hill, Woolfolk Chemical Works Site Draft Remedial Investigation Report, Volume 6 of 6 (Appendix H), July 1992.

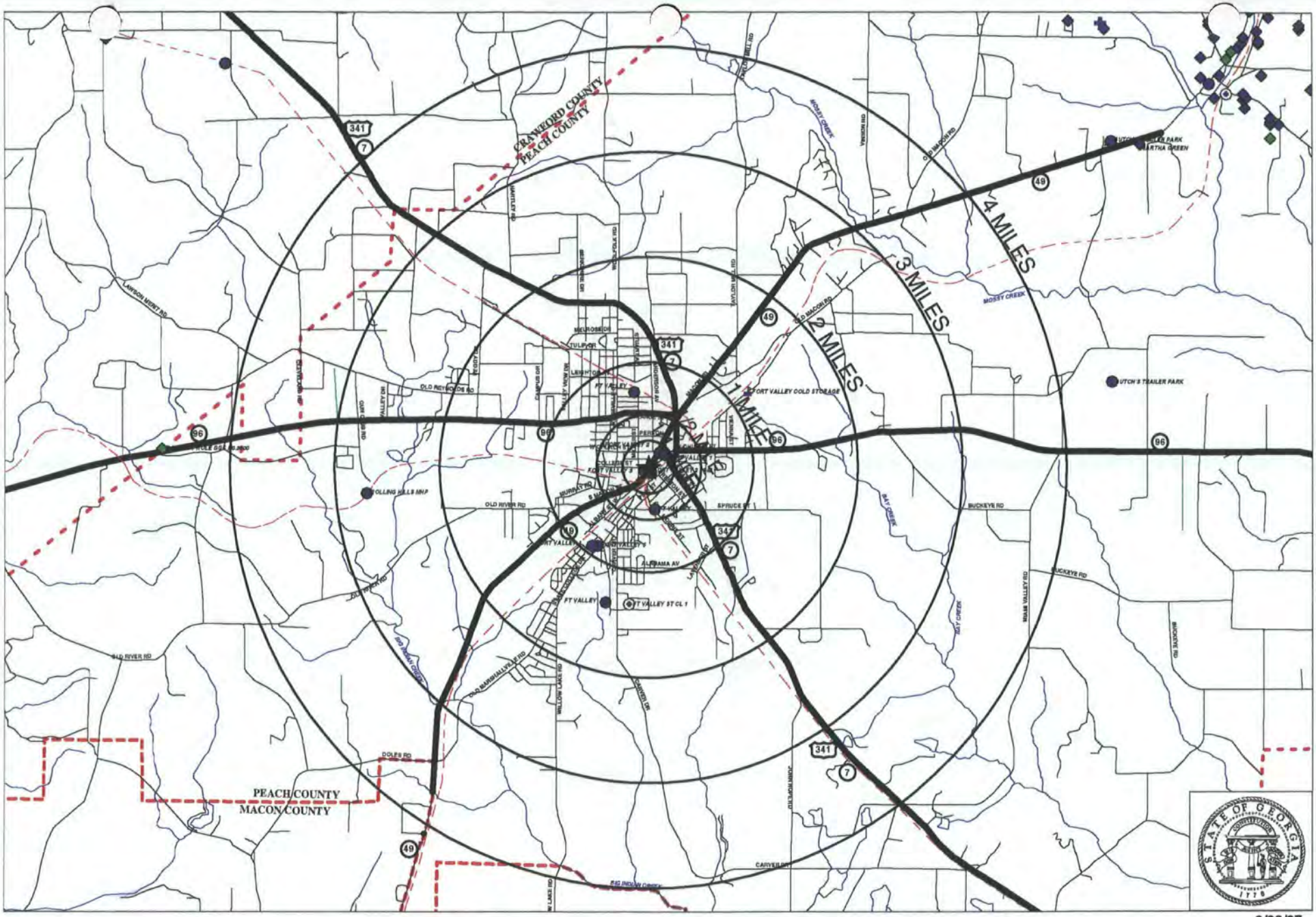
2. White, Steve, Fort Valley Municipal Wells 1 and 2: Preliminary Assessment of Potential Sources of Contamination, June 3, 1997.

3. Guentert, James S., Preliminary Identification of Potential Sources of PCE in Fort Valley Municipal Wells 1 and 2, December 11, 1996.

4. Robertson, Sandra Jo, Georgia Wellhead Protection Plan for City of Fort Valley, Peach County, October 25, 1996


## TABLE 1: SAMPLE LOCATIONS

| SAMPLE | LOCATION | DESCRIPTION | OBJECTIVE |
|---|---|---|---|
| **sample#1** | **I** | subsurface soil sample | to determine presence of PCE contamination [illegible] of site |
| **sample#2** | **II** | subsurface soil sample | to determine presence of PCE on site |

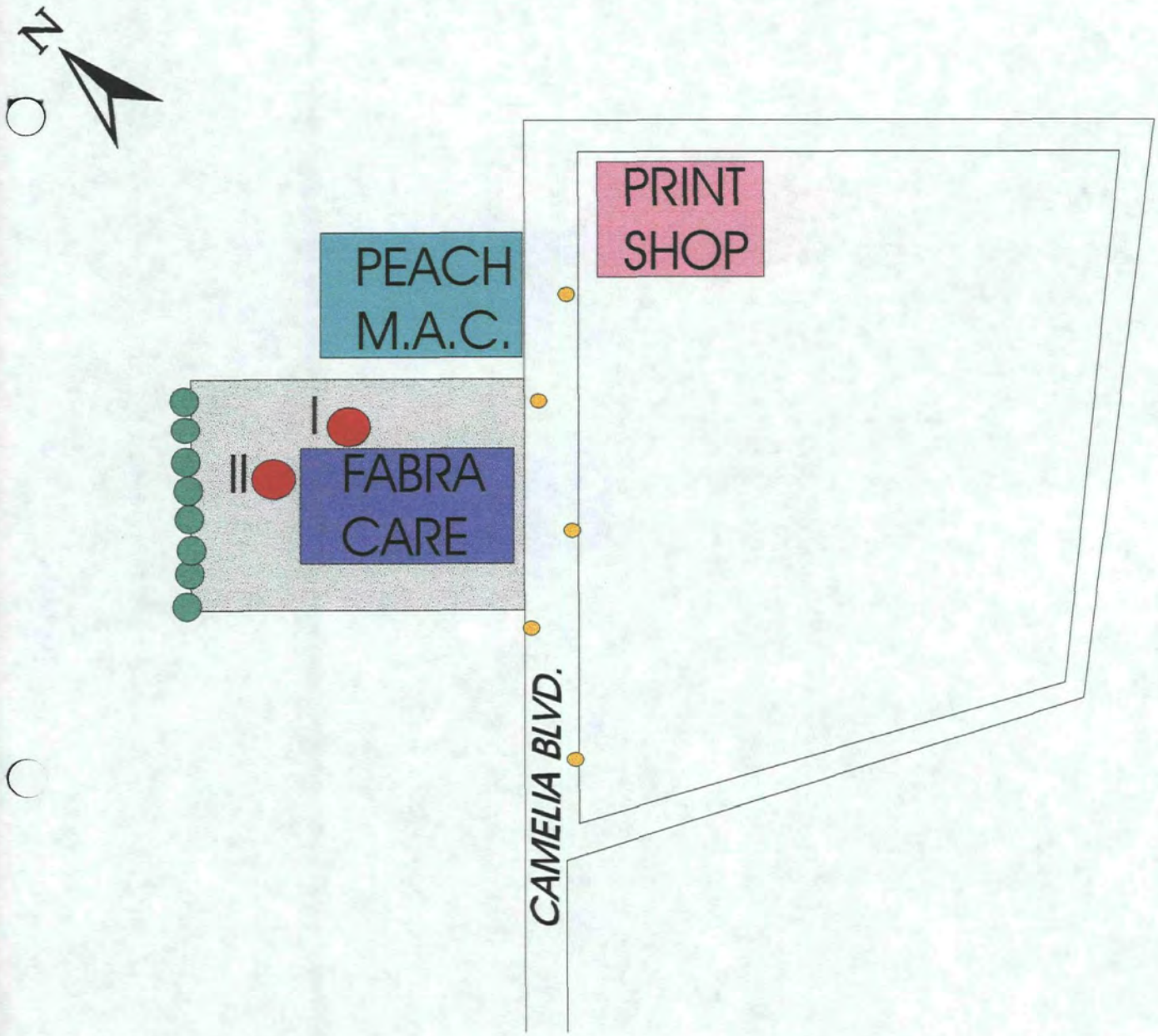



8/29/97

Census Block Group with >zero non-public supply well
Census Block Group served by public water
Public Supply Well
Surface Water Intake
Domestic Well
Unused Well
Spring
Industrial Well
Commercial Well
Irrigation Well
Livestock well
Well - Unknown use
Other Well
County Boundary
Road
Major Highway
Stream/River
Railroad

# FABRACARE CLEANERS
## COLLEGE STREET & STATE HIGHWAY 49
## FORT VALLEY, PEACH COUNTY
1/2, 1, 2, and 3 MILE RADII Well Locations

SOURCES: Georgia Public Water Source Inventory, 1994; US Census Bureau 1990; Ga. Water Source Inv., USGS, 1995




= STORM DRAIN

= SAMPLE

= BUSH

* DRAWING NOT TO SCALE

Site Layout and Proposed Sampling Locations for Fabra Care, Fort Valley, Georgia

## Appendix A

### EQUIPMENT LIST:

| | |
|---|---|
| | GeoProbe Truck |
| | GeoProbe sampling equipment |
| | Tyvek |
| | Hard hats |
| | Full Face Respirators |
| | Steel-toe Work Boots |
| | Dust Cartridges (Respirator) |
| 25 | 8-oz glass containers |
| | Sample Bottle Labels |
| 1 | large ice chest for sample preservation |
| 1 | ice bag |
| 1 | box plastic zip lock bags for sample bottles and vials |
| 1 | box latex gloves |
| 30 | sample tags |
| 1 | Field Book |
| 3 | chain of custody forms |
| 1 | box of garbage bags |
| 1 | camera with film |
| 1 | water level (electronic) tape |
| 6 | sampling spoons |
| 1 | 1/2 gallon bottle of mixed Liquinox non-phosphate detergent for decontamination of measuring tape |
| 2 | indelible markers for sample identification |
| 1 | box/roll of paper towels |
| 1 | sprayer filled with 2-2 1/2 gallons deionized water for decontamination of equipment decontamination bucket and brush |
| 1 | trip blanks supplied by GEPD laboratory |

**SITE SAFETYPLAN:**

**Site Name:** FabraCare Cleaners
**Address:** Peach County, Fort Valley, Georgia

**Type Of Investigation:** Site Inspection (SI)

**Personnel Log:**

| NAME | RESPONSIBILITY | ACKNOWLEDGMENT OF FAMILIARITY WITH SITE SAFETY PLAN* (INITIAL) | SUPERVISOR APPROVAL |
|---|---|---|---|
| Ann Roat | Project Manager | | |
| Faney Foster | Technician/Sampling Assistant | | |
| Thomas Williams | Engineer/GeoProbe Operator | | |
| Mike Laney | Geologist/Sampling Assistant | | |
| | | | |

*SITE SAFETY PLAN CONSISTS OF THIS AND ALL ATTACHED PAGES.

| EMERGENCY AND HAZARD INFORMATION | DESCRIPTION |
|---|---|
| **SPECIAL ACCESS REQUIREMENTS:** | none |
| **EMERGENCY PHONE NUMBERS:** | 911 system in this area |
| **POTENTIAL HAZARDS DESCRIPTION:** | uneven terrain, insect bites, snakes, volatile organic compounds (potential) |
| **PERSONAL PROTECTIVE EQUIPMENT (PPE) TO BE UTILIZED:** | steel-toe boots, hard hat, safety glasses, latex gloves (when sampling) and hearing protection (if necessary) |

# ATTACHMENT F

Georgia Department of Natural Resources
205 Butler Street, S.E., Suite 1154, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Environmental Protection Division
Harold F. Reheis, Director
404/656-7802

May 14, 1998

# TRIP REPORT

| | |
|---|---|
| **SITE NAME AND LOCATION:** | Fabracare Cleaners<br>Ft. Valley, Peach County, Georgia |
| **TRIP BY:** | Ann Roat<br>Environmental Specialist<br>Hazardous Waste Management Branch |
| **ACCOMPANIED BY:** | Faney Foster<br>Environmental Engineer<br>Hazardous Waste Management Branch |
| **DATE OF TRIP:** | August 28, 1997 |
| **OFFICIALS CONTACTED:** | N/A |
| **REFERENCE:** | Site Reconnaissance for<br>Upcoming Site Investigation |

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**COMMENTS:**

The following comments serve to document observations and information obtained during the August 28, 1997 initial site reconnaissance:

1. To reach the site take I-75 South through Macon and exit at SR 49 (exit # 46) to the right in Peach County. Fort Valley is approximately 10 miles southwest of I-75 on SR 49. The address is 204 South Camelia Boulevard.

2. The site had been identified as a potential source to the groundwater contamination in a report entitled "Preliminary Identification of Potential sources of PCE in Fort Valley Municipal Wells 1 and 2" dated December 11, 1996. Perchloroethylene (PCE), also known as tetrachloroethylene, was first identified above detection limits in the Fort Valley municipal water supply Wells 1 and 2 on July 18, 1996. The PCE concentrations have generally ranged from approximately 1 ppb to 2.5 ppb in Well 1 and consistently been

higher in Well 2, ranging from 1 ppb to as high as 18 ppb, with an average of approximately 6.5 ppb. As a precautionary measure Wells 1 and 2 were shut down the second week of August 1996. Fabracare was listed as a potential source of PCE based on preliminary evaluations of the area. (See pictures 1&2)

3. The site is located on approximately .22 of an acre of land that is rectangular in shape and relatively flat and consists of one building that is 31 feet wide and 66 feet long. (See pictures 3, 4, & 5)

4. Upon arriving Fort Valley, EPD met with the Water Utilities Superintendent, Walter Lanter, did a map and parcel map search of the land, went to the facility for some background information and located Wells 1 and 2 in the city in relation to the facility.

**CONCLUSIONS:**

1. The site is currently owned by Mrs. Mary Carter and the business is operated by the owner, Francis McCrary.

2. A sewer line map was acquired from the Utility Commission of Fort Valley.

3. A copy of the Property Record card, the Commercial Building Record, and a copy of the aerial map where the facility was located was acquired.

4. EPD talked with the owner and received information on how they handle the PCE waste that is used onsite and received background information on the facility. According to the owner, this dry cleaner has been operating since 1967 and does currently use PCE. Anew dry cleaning machine was installed in February, 1997 and a concrete-walled boundary was built around the machine. The previous machine was in the same location, situated directly on the concrete floor with no barrier surrounding it. The PCE is presently being reused after being filtered utilizing a refrigeration process. Once a month the spent filters are placed in metal cans that are stored inside the facility, and shipped off to MCF Systems of Atlanta for treatment. It is not known if the waste dry cleaning fluids were released in the past from the area around the previous machine or anywhere outside the facility.

5. Wells 1 and 2 were located upon leaving the facility.

**RECOMMENDATIONS AND FOLLOW-UP REQUIRED:**

1. The forthcoming Site Investigation planned for the last week in October, 1997 will be done and will include sampling the area around the facility to ascertain if contamination on the site exists.

**PHOTOGRAPHS**: 5 Photographs (attached)

**REVIEWED BY:** MDP

R:\ANNR\FTVALLY\SITEREC.RPT

Georgia Department of Natural Resources
205 Butler Street, S.E., Suite 1154, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Environmental Protection Division
Harold F. Reheis, Director
404/656-7802

May 14, 1998

# TRIP REPORT

| | |
|---|---|
| **SITE NAME AND LOCATION:** | Fabracare Cleaners<br>Ft. Valley, Peach County, Georgia |
| **TRIP BY:** | Ann Roat<br>Environmental Specialist<br>Hazardous Waste Management Branch |
| **ACCOMPANIED BY:** | Steve White<br>Environmental Specialist<br>Hazardous Waste Management Branch<br><br>Faney Foster<br>Thomas Williams<br>Environmental Engineer<br>Hazardous Waste Management Branch<br><br>Bob Pierce<br>Eddie Williams<br>Geologist<br>Hazardous Waste Management Branch |
| **DATE OF TRIP:** | October 29, 1997 |
| **OFFICIALS CONTACTED:** | Mary Carter, Owner of the Property and Francis McCrary, Owner of the Business |
| **REFERENCE:** | Site Investigation |

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**COMMENTS:**

The following comments serve to document observations and information obtained during the October 29, 1997 initial site investigation:

1. To reach the site take I-75 South through Macon and exit at SR 49 (exit # 46) to the right in Peach County. Fort Valley is approximately 10 miles southwest of I-75 on SR 49. The address is 204 South Camelia Boulevard.

2. The site had been identified as a potential source to the groundwater contamination in a report entitled "Preliminary Identification of Potential sources of PCE in Fort Valley Municipal Wells 1 and 2" dated December 11, 1996. As a result, this site investigation was necessary to determine if contamination exists on this site.

3. The site is located on approximately .22 of an acre of land that is rectangular in shape and relatively flat and consists of one building that is 31 feet wide and 66 feet long. (See pictures 3, 4, & 5)

4. Upon arriving Fort Valley, EPD began drilling with a Geoprobe at 2 locations on the site. One location was on the east side of the building and the other was on the north side of the building. Each location was samples from 2 to 6 foot depths and 8 to 10 foot depths. ( 5 samples per hole) HNU readings were also taken.

**CONCLUSIONS:**

1. The site has contamination in the soil and groundwater according to the analytical results.

2. The analytical results have been submitted to the owners of the property. As a result, the owners have notified the Hazardous Sites Response Program and the site is going through the a screening process to determine if it will be included in the Hazardous Sites Inventory.

3. The Geological Survey will submit a final report describing the occurrences of their investigation and any additional information regarding the Ft. Valley area during the summer of 1998.

**RECOMMENDATIONS AND FOLLOW-UP REQUIRED:**

1. The site does have contamination in the soil and the groundwater in the surrounding area. This site is suspected to be a contributor of the contamination but is not known at this time whether it is the source of of the PCE or not. This determination should be made by further investigation of the immediate and surrounding areas.

**PHOTOGRAPHS:** 6 Photographs (attached)

**REVIEWED BY:** MEP

# ATTACHMENT G

U.S. EPA REGION IV

# SDMS

## Unscannable Material Target Sheet

DocID: 10716764 Site ID: GA0001974989

Site Name: Jabra Care Cleaners

Nature of Material:

| | | | |
|---|---|---|---|
| Map: | ☐ | Computer Disks: | ☐ |
| Photos: | ☑ | CD-ROM: | ☐ |
| Blueprints: | ☐ | Oversized Report: | ☐ |
| Slides: | ☐ | Log Book: | ☐ |

Other (describe): Site Photos

Amount of material: _____

* Please contact the appropriate Records Center to view the material *