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CALUMET CONTAINER
LAKE COUNTY
HAMMOND, INDIANA
SITE ASSESSMENT AND
EXTENT OF CONTAMINATION REPORT

Revision 2
November 2002

Prepared For:

U.S. Environmental Protection Agency
Emergency and Remedial Response Branch
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77 West Jackson Boulevard
Chicago, Illinois 60604

CALUMET CONTAINER
LAKE COUNTY
HAMMOND, INDIANA
SITE ASSESSMENT AND
EXTENT OF CONTAMINATION REPORT

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SECTION 1
INTRODUCTION

From 29 April to 2 May 2002 and 20 and 21 May 2002, United States Environmental Protection Agency (U.S. EPA) On-Scene Coordinator (OSC) Verneta Simon and the Weston Solutions, Inc. (WESTON®) Superfund Technical Assessment and Response Team (START) initiated a site assessment and extent of contamination investigation at the Calumet Container site located in Hammond, Lake County, Indiana. The site assessment activities were conducted under Technical Document Directive (TDD) S05-0202-001. The analysis of the samples collected during the site assessment was under TDD S05-0202-002.

1.1 OBJECTIVES AND SCOPE OF SITE ASSESSMENT

The objective of this site assessment was to gather information to characterize the nature and extent of soil contamination at the Calumet Container site.

To accomplish these objectives, the site assessment activities consisted of screening soil for lead content with x-ray fluorescence (XRF), collecting surface and subsurface soil samples from the site and selectively analyzing the samples for organic and inorganic parameters.

1.2 REPORT ORGANIZATION

This site assessment report is organized into the following sections.

- Introduction – The introduction provides a brief description of the objective and scope of the site assessment activities.
- Site Background – The site background section provides the site description, site history, and a summary of previous investigations.

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- Environmental Investigation Procedures – The environmental investigation procedures section describes the methods and procedures used during the site assessment activities.

- Environmental Investigation Results – The environmental investigation results section describes the results of sample analysis.

- Nature and Extent of Contamination – The nature and extent of contamination describes the estimated areas and volume of contaminated site soils.

- Conclusions – The conclusions summarize the findings of the site assessment activities.

- References – The reference section provides a list of references utilized in compiling the report.

- Tables, Figures, and Appendices – The tables, figures, and appendices will be provided at the end of the report.

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SECTION 2
SITE BACKGROUND

2.1 SITE DESCRIPTION

The Calumet Container site is located 3631 State Line Avenue in Hammond, Lake County, Indiana. The geographic coordinates of the site are 41° 38' 57" north latitude and 87° 31' 25" west longitude at an altitude of 476 feet above sea level. Approximately 90 percent of the 11-acre, triangular-shaped site is located in Lake County, Indiana and the remaining 10 percent is located in Cook County, Illinois (Figure 2-1). The site is bounded to the north by 136th Street, and in all other directions by the active Indiana Harbor Belt Railway. A chain-link and barbed-wire fence surrounds the site. Other key features on site include patches of dense, ground-cover vegetation and mature trees, an old building foundation, three abandoned tanker trucks and drums and overgrown piles of miscellaneous debris.

On 29 April 2002, a fence contractor for West Shore repaired the chain-linked fence along the pipeline right-of-way. Previously, access to the site was unrestricted due to the breaches in the fence. The chain-link and barbed-wire fence that surrounds the site has a locked gate on the north side, accessed by 136th Street. Along 136th Street, a 40-foot section of fence was collapsed by a pile of soil that had apparently been dumped onto it. Evidence of recent trespassing was still evident and included worn footpaths that cross the site, a fire ring surrounded by chairs and a pet grave with flowers and a flag adorning it, all of which was previously observed during the 20 February 2002 site assessment.

Large piles of scrap metal, tires and semi-trailer frames were seen on the site. START estimated the scrap metal from the semi-truck trailers to be approximately 420 cubic yards. The majority of the scrap metal is located on the northwest corner of the site with a few piles along the West Shore pipeline right-of-way in the middle of the site.

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Both industrial- and residential-use land surrounds the site and within 1/4 mile of the site boundary are recreational-use bodies of water. A mobile home park is located directly adjacent to the site to the east and another is across 136th Street to the northwest. A small pond and wetland are situated in the northeast corner of the property. Across 136th Street to the north is Wolf Lake, an interstate fishing and recreational lake (Figure 2-2). Beyond the rail line to the southwest is Powderhorn Lake and the Burnham Woods forest preserve. Lake Michigan is located less than 3 miles to the northeast of the site.

Two studies have been done to evaluate ground- and surface-water flow patterns in the area of the site (Wapora, 1979 and Soil Testing Services, 1980). Both studies concluded that groundwater tends to flow in a northeast direction from the site. Intermittent ponded surface water at the site has been documented in historic site photographs and records. The movement of surface water off the site is not easily characterized; however, there may be a potential for surface water to flow off site towards nearby Wolf Lake, Powderhorn Lake, or a small stream to the northeast of the site that feeds Wolf Lake. In the past, recreational use of Wolf Lake has been impaired by, among other things, direct or indirect industrial discharges to the lake (U.S. EPA, 1981). A third study of site hydrogeology indicated that the water table is 3-4 feet below the ground surface (bgs)(King, 1979).

Soil types vary on site and adjacent properties. The unconsolidated layer of soil above bedrock in the area of the site is 90-100 feet thick and composed of 15-20 feet of beach and shoreline deposits interbedded with fine gravel, silt and clay over silty, sandy, clay till. It has been noted that the accumulation of oil and paint solids on the site may have acted to seal the soil surface in some areas and not allow percolation of surface water into the ground at those locations (King, 1979). A well log for an installation in the Burnham Woods forest preserve adjacent to Powder Horn Lake, southwest of the site, revealed that the upper 44-feet of soil is clay, followed by 118-feet of shale (Pankanin, 1982). The railroad grade along the eastern edge of the site is composed of fill material, slag, cinders, sand and gravel (King, 1979). North of the site, at the southern end of Wolf Lake are small areas of significant wetlands, classified as Type 4 Deep Marsh (U.S. EPA, 1981).

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Service utilities were noted on the site property (Figure 2-2). An overhead electrical power line enters the property from 136th Street near the gate and terminates on the site at a control box that is mounted on a pole approximately 150 feet south of the gate. There is a buried West Shore petroleum pipeline on the site that runs east to west across the property under a cleared right-of-way. A buried Praxair Nitrogen pipeline also crosses the site. A geophysical report prepared for the Indiana Department of Environmental Management (IDEM) in 1986 indicated the presence of markers or breather pipes for Badger, Marathon, Amoco and Union Carbide pipelines on the site property (Bartlett and Ursic, 1986). According to the U.S. EPA files, there are no drinking water wells in the area that can be threatened by groundwater contamination in the area (Pankanin, 1982).

2.2 SITE HISTORY

The Steel Container Corporation, also known as the Calumet Container Corporation, began operations in the 1960's and was owned and operated by Mr. John Jagiella. Operations at the site included drum and pail reconditioning (5- to 55- gallon) and fiber drum processing. Most of the containers that were serviced were used in the paint and graphic arts industries. In July 1981, Mr. Jagiella filed for bankruptcy in Chapter 11 Federal Bankruptcy Court. The Lake County Commissioners currently own the bulk of the Calumet Container site that is located in Indiana. A small parcel of land in the northwest corner of the site is privately owned by Mr. George Holmes.

During the period that the Calumet Container Corporation facility was in operation, the company was cited with numerous environmental violations regarding air and water contamination and material disposal. In 1980, the Illinois State Attorney General began an investigation to evaluate the movement of groundwater from the site into Illinois (Bitter, 1984). It was determined that groundwater in the area of the site contained elevated levels of organic compounds, including phenolics, toluene, xylene, and PCBs, and heavy metals and that the groundwater had the potential to migrate into Illinois-owned soils and nearby Wolf Lake (Soil Testing Services, 1980). The State of Indiana Stream Pollution Control Board ordered Mr. Jagiella to clean up spilled residues on the

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site and the owner was eventually issued a Final Order by the State of Indiana. Subsequent property inspections following the Final Order yielded violations of that Order and on 16 April 1982, the State of Indiana Attorney General filed an Enforcement Action against Calumet Container Corporation (Bitter, 1984).

Five days after the State of Indiana Enforcement Action was filed, on 21 April 1982, an explosion and fire consumed the main building at the site and the U.S. EPA began a 14-day Immediate Removal Action on 7 May 1982. Thirty cubic yards of sludge and 5,500 gallons of contaminated liquid were removed from the site and disposed of at that time. Analysis of surface water runoff, contents of processing and holding tanks on site and soil at the loading dock area at the time immediately following the fire indicated the presence of lead, chromium, cyanide, arsenic, phenolics, other organics, oil and grease. Following the fire, the U.S. EPA notified Mr. Jagiella and requested that he volunteer to clean up the site. Mr. Jagiella then attempted to organize a group of responsible parties to clean up the site, but failed to do so and as a result, the U.S. EPA initiated a cleanup (Madany and Bowden, 1982).

In accordance with section 104 (a) (1) CERCLA, a Planned Removal Action began at the site on 9 January 1984. U.S. EPA contractor Associated Chemical and Environmental Services of Oregon, Ohio, began a surface cleanup of containerized liquids, solids and sludges that were considered to be hazardous materials. A heavily contaminated area used as a loading dock during facility operation was completely dismantled and removed. Approximately 2-feet of soil was removed from underneath the loading dock and the area was backfilled and capped with 162 tons of clay. Other areas of the site that contained visibly stained soils were also excavated and backfilled with clay (Bitter, 1984).

A site assessment conducted by U.S. EPA and START on 20 February 2002 discovered that the site was littered with several drums, automobile and scrap metal debris, a plating vat, three tanker trucks, an old building foundation and paint chips and residue. A cluster of 14 drums was noted near the

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north gate of the property. Five investigative soil samples and one drum sample were collected and analyzed for a variety of potential contaminants. Sampling results for metals analyses indicated levels of lead, chromium, and PCBs in site soils above U.S. EPA Region IX PRG criteria levels. Based on the results of TCLP analysis of site soils and according to 40 CFR Chapter 1 - 261.24, hazardous waste characteristics of lead and cadmium were detected in site soils. Material sampled from a drum at the site was determined to be hazardous waste based on its flashpoint. The flashpoint of the drummed material was 80 °F which exceeds the criteria for hazardous waste.

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SECTION 3

ENVIRONMENTAL INVESTIGATION PROCEDURES

From 29 April to 2 May 2002 and 20 and 21 May 2002, a site assessment of the Calumet Container property was conducted by U.S. EPA and WESTON START personnel to determine extent of the contamination present in surface and subsurface soils. On-site personnel included OSC Verneta Simon (U.S. EPA) and Don Paxton, Todd Williams, Heather Schichtel, and Greg Gehrig (START). The investigation was conducted in two sampling events. Specific site assessment activities included:

- Site Layout
- XRF Screening
- Geoprobe Investigation and Soil Sampling
- Geoprobe Investigation and Sediment Sampling
- Geotechnical Sampling
- Wetland Delineation

3.1 SAMPLING ACTIVITIES

3.1.1 Site Layout

On 29 April 2002, a sampling grid was layed out to identify locations where Geoprobe core samples would be collected. A GPS was used to navigate from each location to the next, as well as record the GPS location of each point. The grid was created using a 100-foot grid spacing throughout the site. The triangular shape of the site and topographical obstacles such as the pond, trees, and large scrap piles necessitated using offsets from the proposed locations identified on the map used for the grid layout. Trees onsite made GPS reception difficult in some areas, causing some additional skewing of the site grid.

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3.1.2 XRF Screening

A Niton XRF unit was used to screen 143 surface and sub-surface soil and sediment samples from 53 locations on site to determine the location of soil and sediment that contained elevated metal concentrations. Soil and sediment samples were retrieved by Geoprobe coring techniques. XRF screening depths were selected within each soil core to characterize the surface and subsurface soils. Each sample core was typically screened with two to four interval locations ranging from the surface to a 4-foot depth. Plastic zipper-locking bags were filled with sample material and then screened with the XRF unit during the first portion of the assessment, and during the second portion of the assessment the XRF unit was placed directly on the exposed soil in the acetate sleeve that was used to collect the soil core. The primary analyte of interest during the investigation was lead, although 13 other analytes are also detectable by the XRF unit. Screening results were datalogged with the XRF unit. At 13 screening locations, soil samples were collected from the depth interval that was screened and submitted for confirmatory laboratory analysis of lead content. The results of the confirmation sampling are further discussed in Section 4.2.1 of this report.

3.1.3 Surface and Subsurface Soil Sampling

During the 29 April to 2 May 2002 and 20 and 21 May 2002 Site Assessment, 26 investigative surface and subsurface soil samples were collected in order to define the native soil and extent of contamination on site. Samples were collected from selected grid locations and five biased, non-grid locations. Offsets were used in some locations where obstacles were encountered. Sample collection locations are shown in Figure 3-1.

Samples were collected using an ATV-mounted Geoprobe. The ATV-mounted Geoprobe drives a 4-foot long, 2-inch diameter hollow sampling rod into the ground by means of a motor-driven hydraulic hammer. After the rod has been driven into the soil to the desired depth, the motor is reversed to remove the sampling rod. The hollow rods are lined with an acetate insert to collect

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samples and help preserve the cleanliness of the rod interior. After the rod was extracted from the ground, the acetate insert was removed, cut open lengthwise so contents could be observed, geologically logged, and sampled. Geoprobe boring logs are provided in Appendix A.

A total of 26 investigative surface and subsurface soil samples were collected [CC-(0,0) 1'-2', CC-(0,1) 1'-2', CC-(0,2) 1'-2', CC-(0,3) 1'-2', CC-(0,4) 1'-2', CC-(0,10) 3'-4', CC-(0.5, 2.5) 1'-2', CC-(0.5,2.5) 3'-4', CC-(1,2) 2'-3', CC-(1,3) 1'-2', CC-(1,5) 1'-2', CC-(1,7) 1'-2', CC-(1,8) 3'-4', CC-(1,9) 3'-4', CC-(2,3) 1'-2', CC-(2,4) 1'-2', CC-(2,8) 0-6", CC-(2,8) 2'-4', CC-(3,5) 1'-2', CC-(3,7) 1'-2', CC-(3,8) 0-1', CC-(3,10) 0-2', CC-(4,7) 1'-2', CC-(5,6) 0-6", CC-(5,7) 1'-2', and CC(6,7) 3'-4']. Soil samples were collected from the acetate core liners and placed into clear, wide-mouth, glass jars with Teflon-lined lids. Sterile nitrile gloves were donned before the first sample was collected and changed before each subsequent sample. Soil cores were generally collected from 0 to 4 feet below ground surface (ft. bgs) with the exception of one Geoprobe core located at point CC-(0.5, 2.5) which was collected from 0 to 8 ft. bgs. The sample intervals selected for analysis were biased based on Multi-RAE VOC readings, presence of odors, XRF readings, and the presence of paint chips or colored materials (blue, yellow, green, etc.).

Seventeen samples were collected for analysis of selected organic compounds. Once the sampling depth was determined for a soil core, a grab sample was first collected for volatile organic compounds (VOCs) using a disposable EnCore sampler. VOC sampling was followed by the collection of a sample for semi-volatile organic compounds (SVOCs), pesticides and polychlorinated biphenyls (PCBs). Sample aliquots for individual parameters were consistently collected in this order to minimize volatilization of organic compounds prior to sample collection. Ten samples were analyzed for VOCs, SVOCs, pesticides and PCBs [CC-(0,3) 1'-2', CC-(0,4) 1'-2', CC-(1,3) 1'-2', CC-(1,7) 1'-2', CC-(2,4) 1'-2', CC-(2,8) 2'-4', CC-(3,5) 1'-2', CC-(3,10) 0-2', CC-(5,7) 1'-2', and CC-(6,7) 3'-4'], and seven samples were analyzed for VOCs only [(CC-(0,0) 1'-2', CC-(0,1) 1'-2', CC-(0,2) 1'-2', CC-(0.5,2.5) 3'-4', CC-(1,2) 2'-3', CC-(1,5) 1'-2', and CC-(2,3) 1'-2']. During the second sampling event, 20 and 21 May 2002, two soil samples [CC-(1,2) 2'-3' and CC-(0.5,2.5) 1'-2'] were analyzed

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for benzene, toluene, ethylbenzene, and xylene (collectively known as BTEX) compounds instead of for VOCs, SVOCs, PCBs and pesticides because laboratory results from the previous sampling event revealed a predominance of BTEX compounds relative to other organic compounds.

In addition to organic compounds, three soil samples were also sampled for Target Analyte List (TAL) metals [CC-(2,8) 2'-4', CC-(3,10) 0-2', and CC(6,7) 3'-4'] and an additional five investigative soil samples were analyzed for TAL metals only [CC-(1,8) 3'-4', and CC-(1,9) 3'-4', CC-(3,7) 1'-2', CC-(3,8) 0-1', and CC-(4,7) 1'-2']. Five investigative soil samples were collected for lead only, as a supplement to those samples that were analyzed for TAL metals, for the purpose of confirming lead-in-soil contents as determined by XRF screening [CC-(0, 10) 3'-4', CC-(0.5, 2.5) 1'-2', CC-(1, 2) 2'-3', CC-(2, 8) 0-6", and CC-(5, 6) 0-6"].

All samples were labeled and preserved in coolers with ice immediately after sample collection. At the end of the sampling period, samples were packed, transported, and relinquished under chain of custody to ACE Technologies, Inc. located in The Woodlands, Texas and Accura Analytical Labs, Inc. located in Norcross, Georgia for analysis.

Spent personal protective equipment (PPE) and contaminated debris that was generated during the sampling event were containerized in a 55-gallon drum at the site and labeled "PPE".

3.1.4 Sediment Sampling

Three sediment cores were collected using a Geoprobe along the perimeter of the pond, which is located in the northeast corner of the site, to determine if contaminates have migrated into the pond. Each core was geologically logged. Core SD-01 was collected from the northwest side of the pond, core SD-02 was collected from the west side, and core SD-03 was collected from the southwest side. Sediment cores were screened with an XRF and Multi-RAE and logged in the same manner as the

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soils samples. One sediment sample taken from core SD-02 [CC-(SD-02) 0-1'] was analyzed for lead as confirmatory analysis for comparison to XRF screening results.

3.1.5 Geotechnical Sampling

Geotechnical sampling was conducted to determine the potential for future uses of the site such as the placement of a state road along the western boundary of the site. Five soil samples were collected using a Geoprobe for analysis of geotechnical parameters. Sample collection locations are shown in Figure 3-1. Geotechnical samples were collected in 24-inch-long, 3-inch-diameter Shelby soil collection tubes from grid locations (1, 10), (1, 8), (1, 6), (1, 5), and (1.5, 3.5). The tube was advanced 24-inches or to refusal, starting from where native soil was observed. On the northern portion of the site where samples were collected, native soils were observed at the surface. On the southern portion of the site where fill was present, native soils were observed approximately two feet bgs. Samples were analyzed for grains size, particle distribution, United States Geological Survey (USGS) Soil Conservation Survey soil classification, moisture content, organic content, specific gravity, density, and Atterburg limits. Samples were sent to CGC, Inc. located in Madison, Wisconsin for geotechnical analysis.

3.1.6 Wetland Delineation

On 20 May 2002, a wetland investigation of the approximately 11-acre site was performed. The purpose of this investigation was to identify, delineate, and determine the quality of the wetlands and other waters present onsite. Wetlands and other waters were identified and delineated at the site using a United States Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987) defined method and best professional judgment. A GPS unit and a digital camera were used to document wetland features observed onsite.

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SECTION 4
ENVIRONMENTAL INVESTIGATION RESULTS

A Site Assessment was performed to determine the extent of contamination at the Calumet Container site. This section discusses the results of the site assessment activities listed below:

- XRF Screening
- Surface and Subsurface Soil Sampling
- Sediment Sampling
- Geotechnical Sampling
- Wetland Delineation

4.1 XRF SCREENING

XRF screening was conducted on 143 samples, at surface and subsurface intervals, from 53 sample locations. Screening results for lead concentration in soil are presented in Table 4-1. Results indicated that 26 soil samples contained lead concentrations that exceeded 800 ppm. The highest lead concentration detected by XRF (6,848 ppm) was found at location CC-(5,7), approximately 2 feet bgs. Thirteen of the locations that were screened by XRF were selected for lead analysis by wet chemical methods. Results of the confirmation analysis are presented with corresponding field XRF results and determinations of data accuracy and correlation in Table 4-2. A complete listing of XRF field data is presented in Appendix B.

The correlation of the XRF data for lead concentration and the results of the wet chemical analysis technique appear to be within the XRF unit's statistical comparison of precision (± factor) for several samples. For example, at location CC-(3,7), XRF analysis determined that the lead concentration in the soil was 157.8 ± 90.5 parts per million (ppm) or mg/kg, and laboratory analysis on the same sample determined that the lead concentration was 133 mg/kg. The result of the laboratory confirmation falls within the predicted range of precision for the XRF unit. At location CC-(3,8) the XRF result was 752 ± 74.4 mg/kg, and the laboratory result was 805 mg/kg. Again,

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the laboratory confirmation falls within the predicted range of precision for the XRF unit. Other sample results did not correlate well. Relative percent difference (RPD) ranged from 3 percent to 94 percent between XRF and laboratory results. Instances of poor correlation between XRF and laboratory results was likely due to the "nugget effect" whereby the high or low level was encountered from the presence of a piece of the constituent during either the XRF screen or the laboratory analysis. A variance is observed between the results of the two techniques when the "nugget" is only encountered during one of the analyses, either the XRF screen or the laboratory technique.

4.2 SURFACE AND SUBSURFACE SOIL SAMPLING RESULTS

Twenty-six investigative soil samples were collected from 24 locations during this investigation and submitted for laboratory analysis. Analytical parameter selections for each sample are outlined in Section 3.2. Results for these analyses were compared to regulatory criteria levels and presented in Tables 4-3 through 4-6. Three sets of criteria were used for comparison in the data presentation; U.S. EPA Region IX Preliminary Remediation Goals (PRGs), the State of Indiana Risk Integrated System of Closure (RISC) cleanup protocols, and the Illinois Environmental Protection Agency (IEPA) Tiered Approach to Corrective Action Objectives (TACO). Criteria levels for industrial-use land were used to evaluate the data. Figure 4-1 shows sample locations, analytical results, and XRF screening results that exceeded the criteria. Analytical results are presented in Appendix C.

4.2.1 Metals in Soil

Surface and subsurface soils were sampled at eight locations and submitted for TAL metals analysis [CC-(1,8) 3'-4', and CC-(1,9) 3'-4', CC-(2,8) 2'-4', CC-(3,7) 1'-2', CC-(3,8) 0-1', CC-(3,10) 0-2', CC-(4,7) 1'-2', and CC-(6,7) 3'-4']. Seven out of fourteen investigative samples had concentrations of lead or other metals that were above industrial criteria levels (Table 4-3).

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Lead concentrations in the samples ranged from 2.8 mg/kg to 13,000 mg/kg. Lead concentrations exceeded the criteria level (1,000 mg/kg) at six sampling locations [CC-(0.5,2.5) 1'-2', CC-(1,2) 2'-3', CC-(1,9) 3'-4', CC-(2,8) 2'-4', CC-(3,10) 0-2', and CC-(6,7) 3'-4']. The highest concentrations of lead were detected at the following sampling locations:

- CC-(1,9) 3'-4'(13,000 mg/kg); and
- CC-(0.5,2.5) 1'-2' (6,520 mg/kg).

Concentrations of cadmium in soils ranged from undetectable to 27,000 mg/kg. Cadmium concentrations exceeded the criteria level (10,000 mg/kg) in soils at two sampling locations:

- CC-(3, 10) 0-2' (27,000 mg/kg); and
- CC-(1, 9) 3'-4' (21,000 mg/kg).

Concentrations of arsenic in soils ranged from undetectable to 280 mg/kg. Arsenic concentrations exceeded the criteria level (20 mg/kg) in soils at three sampling locations:

- CC-(3,10) 0-2' (280 mg/kg);
- CC-(3,7) 1'-2' (64.9 mg/kg); and
- CC-(2,8) 2'-4' (45 mg/kg).

Chromium and iron criteria were also exceeded at two soil sampling locations. Concentrations of chromium ranged from 1.0 mg/kg to 780 mg/kg and exceeded the criteria level (448 mg/kg) at sampling location CC-(3,7) 1'-2' (780 mg/kg). Iron concentrations in soil ranged from 3.36 mg/kg to 120,000 mg/kg, exceeding the criteria level (100,000 mg/kg) only at sampling location CC-(3,7) 1'-2' (120,000 mg/kg).

4.2.2 VOCs and BTEX in Soil

Seventeen surface and subsurface soil samples were analyzed for VOCs or BTEX. The results from these analyses in site soils are presented in Table 4-4 and Figure 4-1. Results indicate that VOCs or BTEX were detected at concentrations that exceeded the criteria levels at six sampling locations

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[CC-(0,0) 1'-2', CC-(0,1) 1'-2', CC-(0,2) 1'-2', CC-(0,3) 1'-2', CC-(1,5) 1'-2', and CC-(2,4) 1'-2']. Individual VOCs that exceeded criteria levels on site were: ethylbenzene, total xylenes, toluene and 1,2-dichloropropane. Ethylbenzene concentrations in soil samples ranged from undetectable to 970,000 ug/kg. Those concentrations of ethylbenzene that exceeded the criteria level (230,000 ug/kg) were the following:

- CC-(1,5)1'-2' (970,000 ug/kg);
- CC-(0,1) 1'-2' (750,000 ug/kg);
- CC-(0,2) 1'-2' (620,000 ug/kg); and
- CC-(0,3) 1'-2' (390,000 ug/kg).

Total xylenes concentrations in soil samples ranged from undetectable to 4,200,000 ug/kg. At the following five sampling locations, concentrations of total xylenes were detected at levels greater than the criteria level (210,000 ug/kg):

- CC-(0,1) 1'-2' (4,200,000 ug/kg);
- CC-(1,5)1'-2' (3,200,000 ug/kg);
- CC-(0,2) 1'-2' (2,300,000 ug/kg);
- CC-(0,3) 1'-2' (1,700,000 ug/kg); and
- CC-(0,0) 1'-2' (240,000 ug/kg).

Toluene concentrations in site soils ranged from undetectable to 8,400,000 ug/kg. Concentrations of toluene exceeded the criteria level (520,000 ug/kg) at the following three sampling locations:

- CC-(0,1) 1'-2' (8,400,000 ug/kg);
- CC-(0,2) 1'-2' (3,600,000 ug/kg); and
- CC-(1,5) 1'-2' (1,200,000 ug/kg).

Concentrations of 1,2-dichloropropane in site soils ranged from undetectable to 2,600 ug/kg. One sample, at location CC-(2,4) 1'-2' depth (2,600 ug/kg), exceeded the criteria level for 1,2-dichloropropane (800 ug/kg).

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4.2.3 SVOCs in Soil

Ten surface and subsurface soil samples were analyzed for SVOCs. The results are presented in Table 4-5 and Appendix C. Criteria levels were not exceeded by any SVOCs in these samples. Three SVOCs were detected above method limits: 2-methylnaphthalene, bis(2-ethylhexyl)phthalate and naphthalene. The greatest concentrations of these SVOCs were detected in the following samples: CC-(1,7) 1'-2', (4,700 ug/kg of 2-methylnaphthalene), CC-(0,3) 1'-2' (14,000 ug/kg of bis(2-ethylhexyl)phthalate), and CC-(1,7) 1'-2' (8,300 ug/kg of naphthalene).

4.2.4 PCBs and Pesticides in Soil

Ten surface and subsurface soil samples were analyzed for PCBs and pesticides. PCB analytical results are displayed in Appendix C. No PCB compounds were detected in any of the samples. Pesticide results are displayed in Table 4-6. No pesticide compounds were detected above criteria levels in these samples. The pesticides at greatest concentrations in soil were found at the following site locations: CC-(0, 4) (220 ug/kg of 4,4-DDT), CC-(3, 5)(94 ug/kg of Chlordane), and CC-(2-9) 2'-4' (50 ug/kg of 4,4'-DDE).

4.3 SADA SOFTWARE USE FOR VISUALIZATION OF ON-SITE EXTENT OF CONTAMINATION AND HUMAN HEALTH RISK

Spatial Analysis and Decision Assistance (SADA) software was used to further illustrate the extent of contamination as shown in Figure 4-1 and visually assess the risk to human health. The color-scaled, two-dimensional diagrams produced by the SADA software makes visualizing contamination easier and is a useful tool for communicating analytical results to interested parties. Each SADA plot presented in Appendices E and F represents the area of the site with overlays of the concentration of specific parameters (Appendix E) and an estimate of the human health risk that is based on contaminant concentrations (Appendix F). Concentrations of contaminants in surface soil

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or sediment were used to generate each plot, except in the cases where a subsurface sample had a greater concentration of contaminant than the surface soil at the same location. In these cases, the highest concentration of the contaminant at depth was used. For samples that had concentrations below the method limits of detection, one half of the detection limit was used to represent the sample concentration, with the exception of benzene. Undetectable levels of benzene were assumed to have a concentration of zero.

Extent of contamination figures generated by SADA software are presented in Appendix E for all constituents that exceed screening levels (i.e., ethylbenzene, m-p xylene, o-xylene, benzene, toluene, 1,2-dichloropropane, arsenic, cadmium, chromium, iron, and lead). It should be noted that the color scale for each figure denotes relative concentration of the contaminant and does not necessarily reflect the concentration of the contaminant relative to criteria levels or remediation goals. Ethylbenzene, m-p xylene, benzene, toluene, 1, 2-dichloropropane and lead concentrations are clearly shown in the SADA plots to be greater in the southwest corner of the site than other areas of the site. Likewise, o-xylene is shown to be relatively high in the east corner of the site and areas of relatively high metals concentrations (lead, arsenic, cadmium, chromium and iron) are evident in the northern third of the site, including the northwest and east corners. Similar patterns are found in Figure 4-1 where analytical data is plotted directly onto a site map.

SADA provides a human health risk assessment module to calculate the risk of adverse health impacts on a population exposed to toxic chemicals found in groundwater, surface water, soil, and sediment (*Spatial Analysis and Decision Assistance (SADA) Version 2.3 User Guide*. January 2002. http://www.tiem.utk.edu/~sada/). (See Appendix G). The toxicological parameters included with SADA were taken from the United States Environmental Protection Agency's (EPA's) Integrated Risk Information System (IRIS) and the Health Effects Assessment Summary Tables (HEAST). For a given set of values, SADA finds the minimum of the 95 percent upper confidence limit (UCL95) and the maximum detected value, and using this exposure concentration, SADA calculates risk based on the contaminant and the exposure scenario. For this site, the industrial scenario was evaluated.

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Under the industrial scenario, industrial workers are expected to be routinely exposed to contaminated media within a commercial or industrial setting. The future industrial scenario is evaluated using default values provided by EPA for the ingestion, dermal contact, and inhalation exposure routes. Soil exposures are also based on the potential for the use of heavy equipment and related traffic in and around the contaminated soil and sediment. Therefore, soils and sediment could be disturbed, producing particulate emissions. It should be noted that the assumptions and default parameters for the industrial land use scenario do not reflect the use of protective clothing or other safety precautions.

The risk to human health due to the presence of chemicals that exceed screening levels (i.e., ethylbenzene, m-xylene, o-xylene, benzene, toluene, 1,2-dichloroprane, arsenic, cadmium, and chromium) on site can be visualized with the assistance of the SADA plots in Appendix F. Lead and iron are not evaluated using SADA due to the lack of toxicity values (i.e., slope factor or reference dose). The plots assume future unrestricted residential land use, and that the contaminants pose an ingestion or inhalation risk. Note that the color scale refers to an index number that corresponds to the amount of risk present at locations around the site. Generally, for compounds that are potential carcinogens, a risk is present if the index is greater than $1x10^{-6}$; an acceptable risk is described with an index between $1x10^{-6}$ and $1x10^{-4}$; and a high level risk is described with an index greater than $1x10^{-4}$. Benzene, 1,2-dichloropropane, arsenic, cadmium, and chromium are potential carcinogens, though cadmium and chromium are carcinogenic only through the inhalation route. The other contaminants under investigation, ethylbenzene, m-xylene, o-xylene, and toluene are non-carcinogenic and are therefore only considered a health risk if the hazard index is greater than one. Resultant human health risk indices are presented in Table 4-6.

The figures in Appendix F display the same trends as the figures in Appendix E that present the concentration of contaminants on site. That is, where the concentration of each contaminant is greater, the index of risk is greater. Highest levels of carcinogenic risks are present in areas of high concentrations of arsenic (north central site) and 1,2-dichloropropane (southwest corner of site).

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High level risk index values for ingestion and inhalation exposure pathways range from 2.77×10^{-4} to 176 in these areas due to the presence of arsenic and 1,2-dichloropropane.

Highest levels of non-carcinogenic risk due to ingestion are present in the both the southwest corner of the site and the northern third of the site. Risk indices for these locations range from 1.28 to 41.1 due to high levels of arsenic, cadmium, ethylbenzene, m-p xylenes and toluene.

4.4 GEOTECHNICAL SAMPLING

A total of five individual 3-inch diameter Shelby Tube (ST) soil samples were collected at the site. The ST soil samples were collected from 0 to 4 feet total depth. The ST soil samples were analyzed for percent moisture, percent organic content (%), and percentage of grain size distribution. The Atterburg limits analysis was not performed by the laboratory due to the soil type. The analytical results of the five individual ST soil samples were analyzed by CGC, Inc. of Madison, Wisconsin.

The analytical results indicated soils composed primarily of brown, fine-grained sands. The sand content of the soil samples ranged from 80 to 95.9% in four of the five ST soil samples collected. The ST soil sample collected at sampling location CC-(1, 6) contained a higher percentage of silt at 50.4% total silt. The moisture content of the sand was between 19.1 and 25.2%. The total organic content was between 1.2 and 3.9 %.

The particle size analysis generated by the ST soil samples indicates that the soil is primarily well-drained fine sand. Fine-grained sands of this type are a typical material used in the base of most roads. However, with the porous nature of the material and unknown site hydrologic conditions, it is recommended that a test of the sand's strength be performed prior to paving the surface of the site. A strength test will determine how much load the sand could hold per square foot and if it could support road traffic. The geotechnical results are presented in Appendix D.

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4.5 WETLAND DELINEATION

The 11-acre site is comprised of approximately 5.15 acres of forested, scrub/shrub and emergent wetlands were identified and delineated on the site. These wetlands were found along the southeastern edge and the northern half of the property. The wetlands are primarily a mixture of emergent and scrub/shrub systems that grade to a forested wetland system as you proceed northwest towards 136th Street and the adjacent property. An open water/wetland complex is located in the eastern point of this triangular property. No streams or ditches were identified on the site. Wetland areas are illustrated in Figure 4-2.

Four wetland areas were delineated at the site. Wetland Area 1 consisted of several points around a small pond and an associated wetland complex. Wetland Area 2 consisted of several points along the southeastern border of the property. Wetland Area 3 is a small depression at the southern part of the property adjacent to the former building complex. Wetland Area 4 which is located along the northern portion of the site, is a large wetland complex that encompasses approximately 40 % of the property. Three small areas of upland and fill were surveyed within Wetland Area 4 with GPS and are noted on the wetland delineation map as being non-wetland areas. Further details are documented in the June 2002 Wetland Delineation Report generated by WESTON.

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SECTION 5

NATURE AND EXTENT OF CONTAMINATION

The objective the site assessment was to evaluate the nature and extent of contamination, in order that an informed decision could be made regarding the level of that is presented by contaminants on site and the appropriate type of removal action(s) necessary. For the assessment, field data was collected and compared to screening levels to delineate the extent of contamination on site. The following discussion addresses the nature and extent of contamination in the site surface and subsurface soils.

To determine the nature and extent of contamination, analytical results were compared to U.S. EPA Region IX Preliminary Remediation Goals (PRGs), the State of Indiana RISC cleanup protocols, and the Illinois Environmental Protection Agency (IEPA) Tiered Approach to Corrective Action Objectives (TACO). Criteria levels for industrial-use land were used to evaluate the data. Concentrations of four VOCs and five metals in site soils exceeded criteria levels. The VOCs that appeared in concentrations that exceeded the criteria levels include ethylbenzene, m/p-xylenes (total xylenes), toluene, and 1,2-dichloropropane. Concentrations of lead, cadmium, chromium, arsenic, and iron exceeded the criteria for metals contamination.

5.1 VOC Extent of Contamination

Estimates of the area, depth, and volume of soil contaminated with VOCs were generated by determining sample locations that had metals concentrations that exceeded criteria levels, and then estimating both a surface area and depth of contamination. As determined by laboratory results and displayed in Figure 4-1, a large area in the southern portion of the site is contaminated with VOCs. In order to approximate a surface area on the map that would represent the contaminated soil, all data points that identified VOC contaminated soil were identified and the contamination in the areas between data points were extrapolated. Contamination was assumed to radiate out from a location

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that contained contaminated soil for a distance that was half of the way to the nearest location where contaminant levels were less than criteria levels. The area of the site that is contaminated with VOCs is estimated to be 69,373 square feet (ft^2). A graphic representation of the area is provided in Figure 5-1.

An estimate of the volume of VOC contaminated soil on site can made by using the areal extent of VOC contaminated soil and an average depth of contamination. Depth of contamination was determined by inspecting the boring logs for each sample location (Appendix A). The depth of contamination was determined to be the depth below which no obvious visible soil staining or elevated levels of VOCs in the air inside the boring were noted during logging. However, if the soil sample taken from that location that was determined to be contaminated was collected from a depth deeper than this horizon, than the sample depth was used as the depth of contamination. Sample depth was also used for depth of contamination if no staining or elevated VOC levels were noted at the location. A depth of contamination was determined for each sample location included in the contaminated area. The average depth of contamination for VOCs on site is approximately 30 inches. Note that the water table in this region is present at three to four feet bgs (see Section 2.1). The average depth of VOC contamination, 30 inches, was used to calculate the volume of VOC contaminated soils on site. The total volume on site of VOC contaminated soil is 6,423 cubic yards (yd^3).

5.2 Metals Extent of Contamination

Estimates of the area and volume of soil contaminated with metals were generated in a similar manner as was used to determine the extent of VOC contamination on site. Both laboratory and field results were used to identify contaminated areas of the site; that is, the analytical data (for all metals) and the field XRF data (for lead only). As displayed in Figure 4-1, a large portion of the site had consistently high levels of lead, chromium, cadmium, arsenic and iron. The same method of data extrapolation between sample points was used as was described in Section 5.1.. The area of the site

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that is contaminated with metals is estimated to be 178,110 ft^2. A graphic representation of the area is provided in Figure 5-2.

By using the area of the site that contains metals contaminated soil and an average depth of contamination, an estimate of the volume of metals contaminated soil on site can determined. Depth of metals contamination was determined by inspecting the boring logs for each sample location (Appendix A). If fill material was present at the sample location, the maximum depth of the fill material was used as the depth of contamination. However, if the soil sample taken from that location was collected from a depth deeper than the fill layer, than the sample depth was used as the depth of contamination. Sample depth was also used for depth of contamination if no fill material was present at the location. A depth of contamination was determined for each sample location included in the contaminated area. The average depth of contamination for metals on site, by this method, is approximately 31 inches. Based on an areal extent of metals contaminated soil of 178,110 ft^2 and depth of 31 inches the total volume of metal contaminated soil is 17,041 yd^3.

5.3 Volume Estimate of Soil Contaminated with Comingled Waste

Portions of the two areas determined to be contaminated with either VOCs or metals overlap. An overlay of the two areas is shown in Figure 5-3. By delineating the areas that overlap and those that do not, separate volume estimates can be made for different types of soil contamination on site:

- the estimated volume of soil contaminated with VOCs only is 2,207 yd^3;
- the estimate volume of soil contaminated with metals only is 12,684 yd^3; and
- the estimated volume of soil contaminated with comingled waste is 4,357 yd^3.

The total volume of contaminated soil on site is approximately 19,250 yd^3.

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SECTION 6
CONCLUSIONS

The Calumet Container site is located in Hammond, Lake County, Indiana. Approximately 90 percent of the 11-acre site is located in Lake County, Indiana and the remaining 10 percent is located in Cook County, Illinois. The Calumet Container Corporation occupied the site from the time it began operations in the 1960's until it closed permanently due to a catastrophic fire on 21 April 1982. Operations at the site included drum and pail reconditioning and fiber drum processing. Both industrial- and residential-use land surrounds the site. A small pond and wetland is situated in the northeast corner of the property and across 136th Street to the north is Wolf Lake, an interstate fishing and recreational lake. Mobile home parks are located to the east and northwest of the site, and to the southwest is Powderhorn Lake and the Burnham Woods forest preserve. Lake Michigan is located less than 3 miles to the northeast of the site. Most of the site is enclosed bya fence, but access to the site is unrestricted through a fence-break and evidence of trespassing is apparent.

The 11-acre site is comprised of approximately 5.15 acres of forested, scrub/shrub and emergent wetlands which were identified and delineated on the site. These wetlands were found alongthe southeastern edge and the northern half of the property. The wetlands are primarily a mixture of emergent and scrub/shrub systems that grade to a forested wetland system at the northwest portion of the site and adjacent property. An open water/wetland complex is located in the eastern point of this triangular property.

A site assessment was conducted on 20 February 2002, and investigators discovered that the site was littered with large amounts of drum, automobile and scrap metal debris, a plating vat, three tanker trucks, an old building foundation and paint chips and residue. A cluster of 14 drums was noted near the north gate of the property. Five investigative soil samples and one drum sample were collected and analyzed for a variety of potential contaminants. Analytical results indicated that the drummed sample was hazardous, based on flammability and elevated concentrations of metals were present in soil samples.

On 29 April to 2 May 2002 and 20 and 21 May 2002, a site assessment of the Calumet Container property was conducted by WESTON START personnel to determine the surface and subsurface

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extent of the contamination onsite.

Twenty-two investigative surface and subsurface soil samples were collected from 53 boring locations on the site. Samples were analyzed for metals, VOCs, SVOCs, PCBs, and pesticides. To determine the nature and extent of contamination, analytical results were compared to U.S. EPA Region IX Preliminary Remediation Goals (PRGs) and the State of Indiana Risk Integrated System of Closure (RISC) cleanup protocols. Criteria levels for industrial-use land were used to evaluate the data. Five metals and four VOCs were found at concentrations that exceeded criteria levels. Concentrations of lead, cadmium, chromium, arsenic and iron exceeded metals criteria, and ethylbenzene, toluene, m/p-xylene (total xylenes), and 1,2-dichloropropane exceeded VOC criteria levels. The criteria exceedences for VOCs and metals were observed in one large area on the southern portion of the site, and in addition, metals contamination extended throughout a large portion of the entire site.

Surface areas representing contamination on site and corresponding volumes of contaminated soil were estimated for both metal- and VOC-contaminated soils. Approximately 2,207 yd^3 of soil is considered to be contaminated due to high concentrations of VOCs only; approximately 12,684 yd^3 of soil is considered to be contaminated due to high concentrations of metals only; and 4,357 yd^3 of soil is considered to be contaminated by comingled waste, that is both VOCs and metals. The total volume of contaminated soil on site is approximately 19,250 yd^3.

A total of five individual 3-inch diameter Shelby Tube (ST) soil samples were collected at the site. The ST soil samples were collected from 0 to 4 feet total depth. The particle size analysis generated by the Shelby Tube soil samples indicates that the soil is primarily well-drained fine sand. Fine-grained sands of this type are a typical material used in the base of most roads. However, with the porous nature of the material and unknown site hydrologic conditions, it is recommended that a test of sand strength be performed prior to paving the surface of the site. A strength test will determine how much load the sand could hold per square foot and if it could support road traffic.

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SECTION 7

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FIGURES

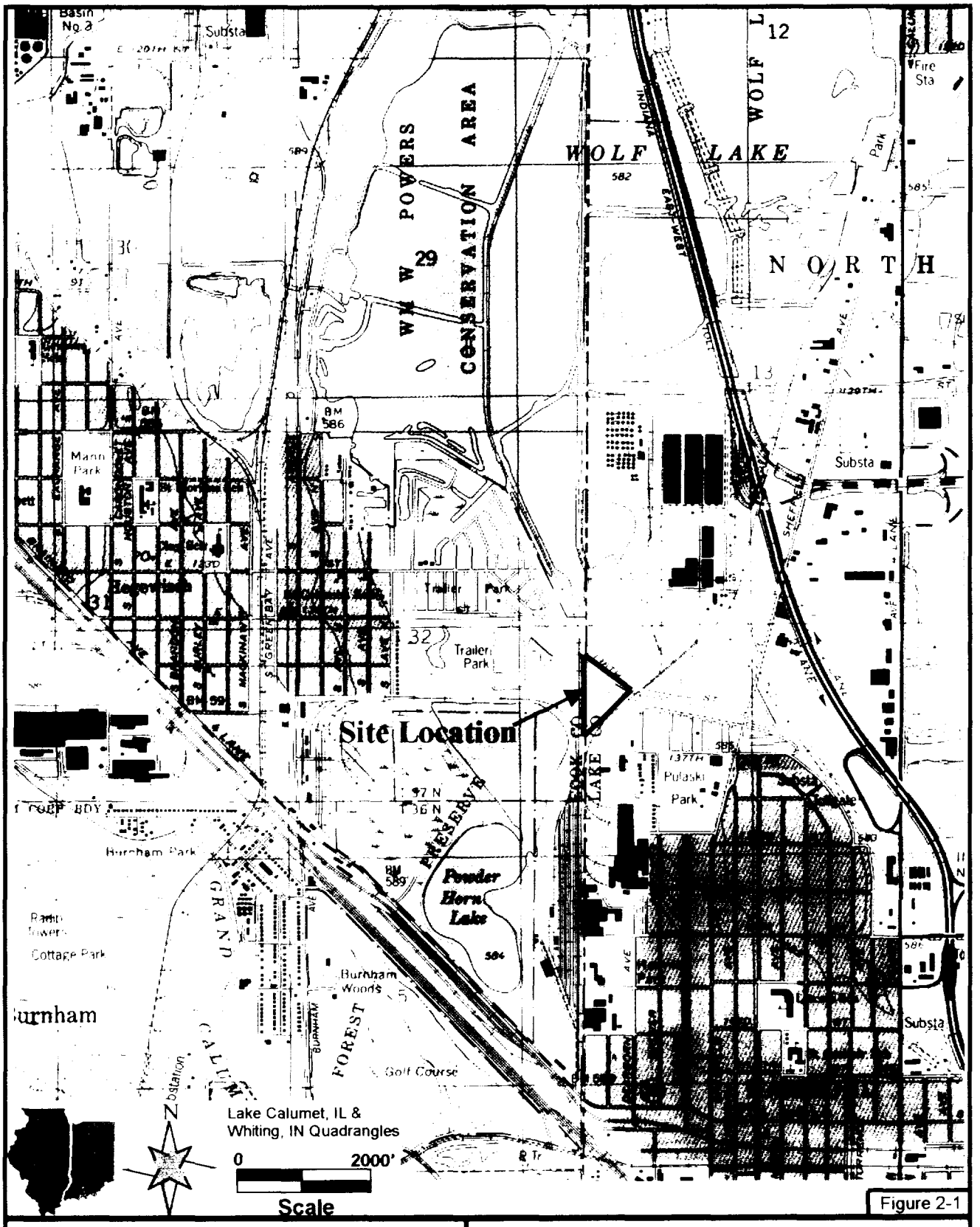

Figure 2-1

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Suite 500
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TOPOGRAPHICAL SITE LOCATION MAP

CALUMET CONTAINER SITE

Hammond, Lake County, Indiana and Cook County, Illinois

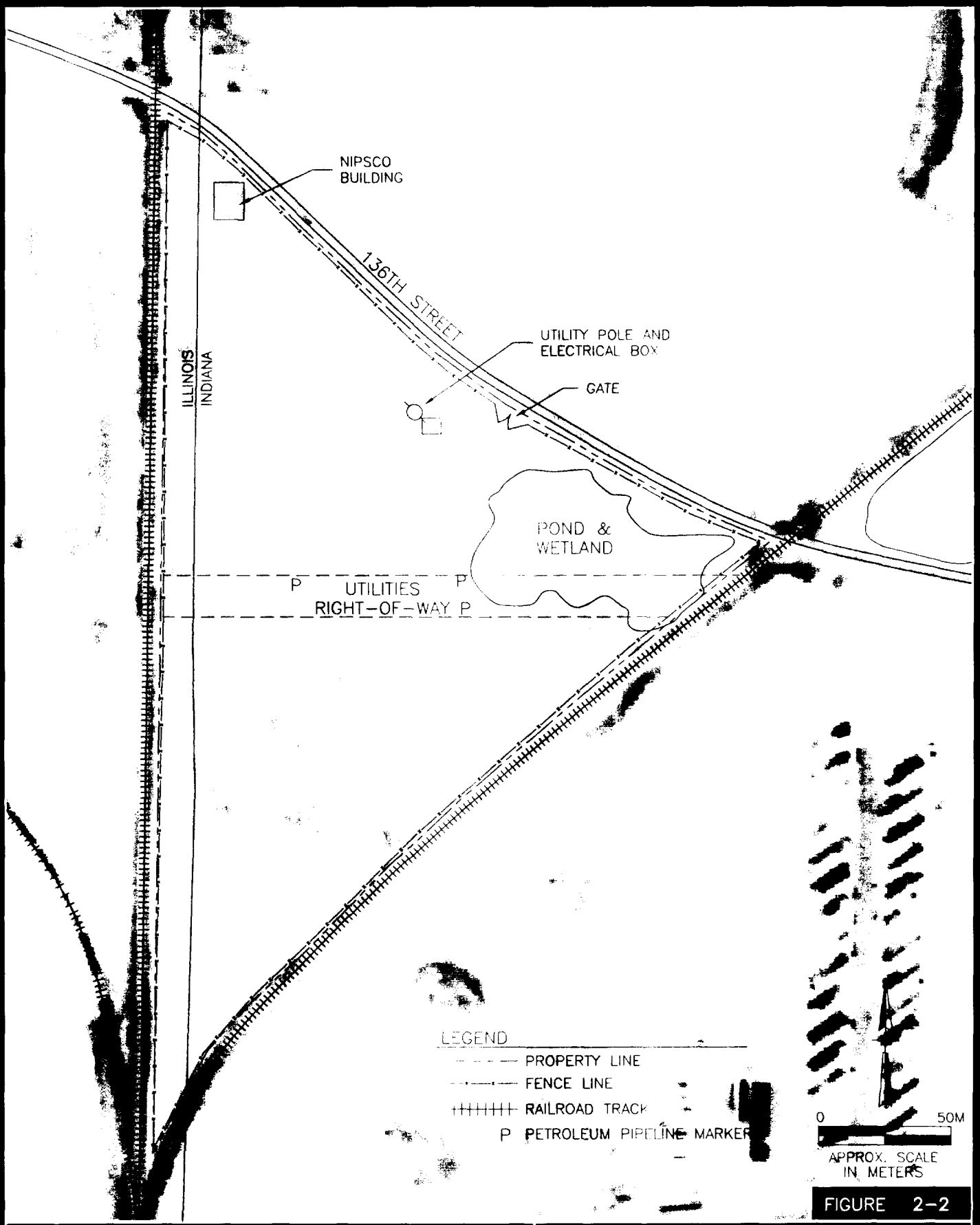

FIGURE 2-2

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SITE MAP
CALUMET CONTAINER SITE
U.S. EPA
Chicago, Illinois

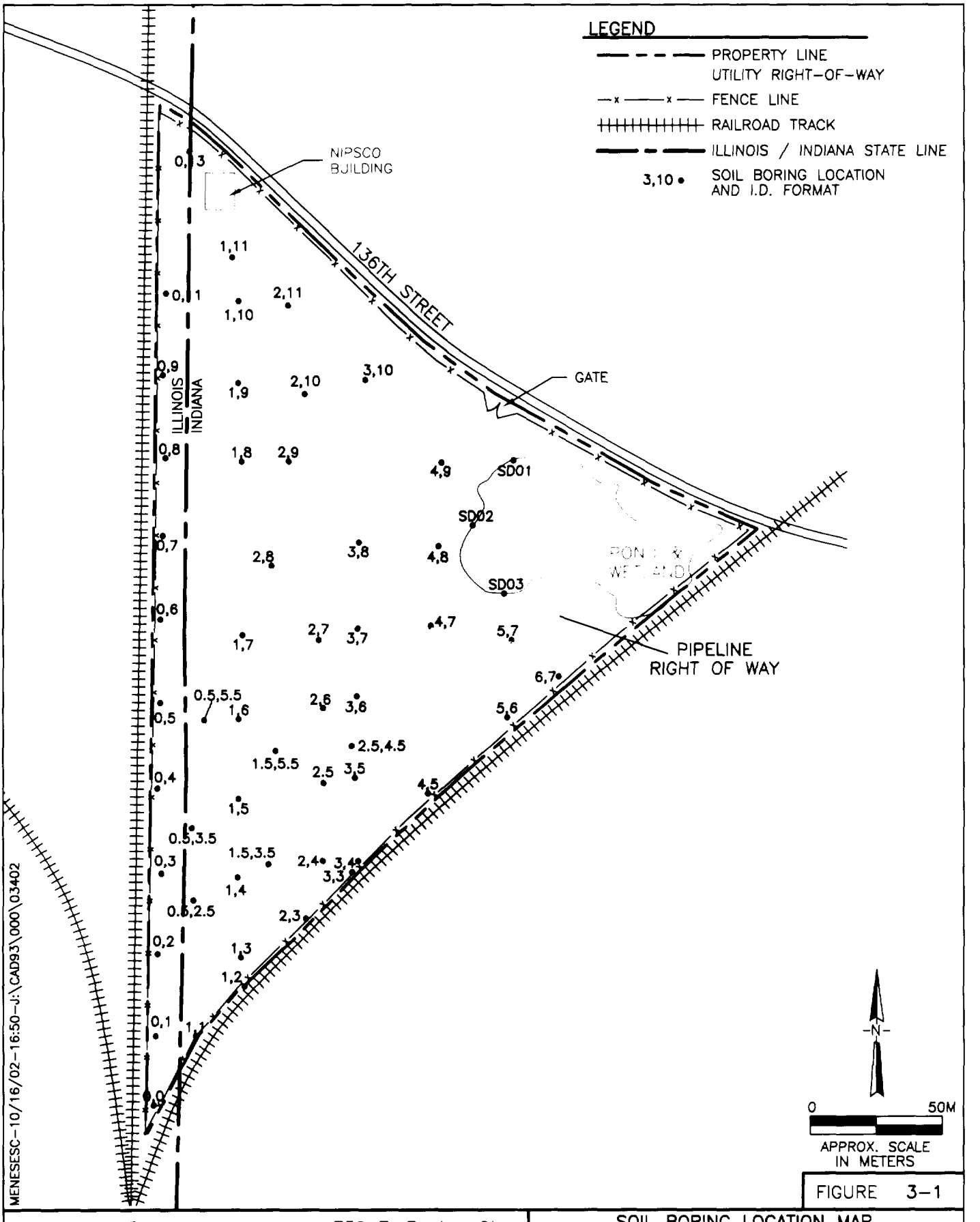

FIGURE 3-1

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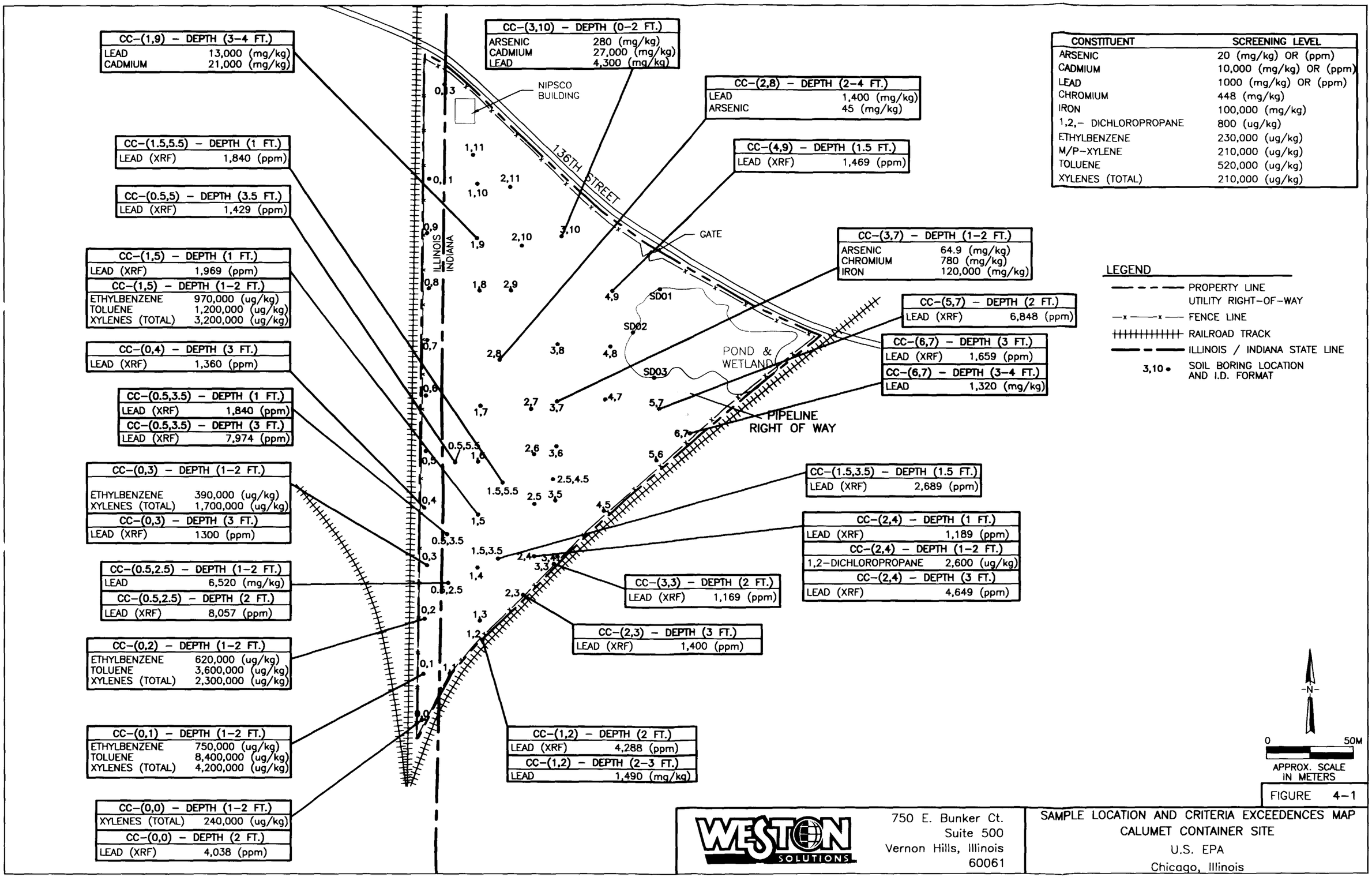
SOIL BORING LOCATION MAP
CALUMET CONTAINER SITE
U.S. EPA
Chicago, Illinois



CONSTITUENT	SCREENING LEVEL
ARSENIC	20 (mg/kg) OR (ppm)
CADMIUM	10,000 (mg/kg) OR (ppm)
LEAD	1000 (mg/kg) OR (ppm)
CHROMIUM	448 (mg/kg)
IRON	100,000 (mg/kg)
1,2,- DICHLOROPROPANE	800 (ug/kg)
ETHYLBENZENE	230,000 (ug/kg)
M/P-XYLENE	210,000 (ug/kg)
TOLUENE	520,000 (ug/kg)
XYLENES (TOTAL)	210,000 (ug/kg)

FIGURE 4-1

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SAMPLE LOCATION AND CRITERIA EXCEEDENCES MAP
CALUMET CONTAINER SITE
U.S. EPA
Chicago, Illinois

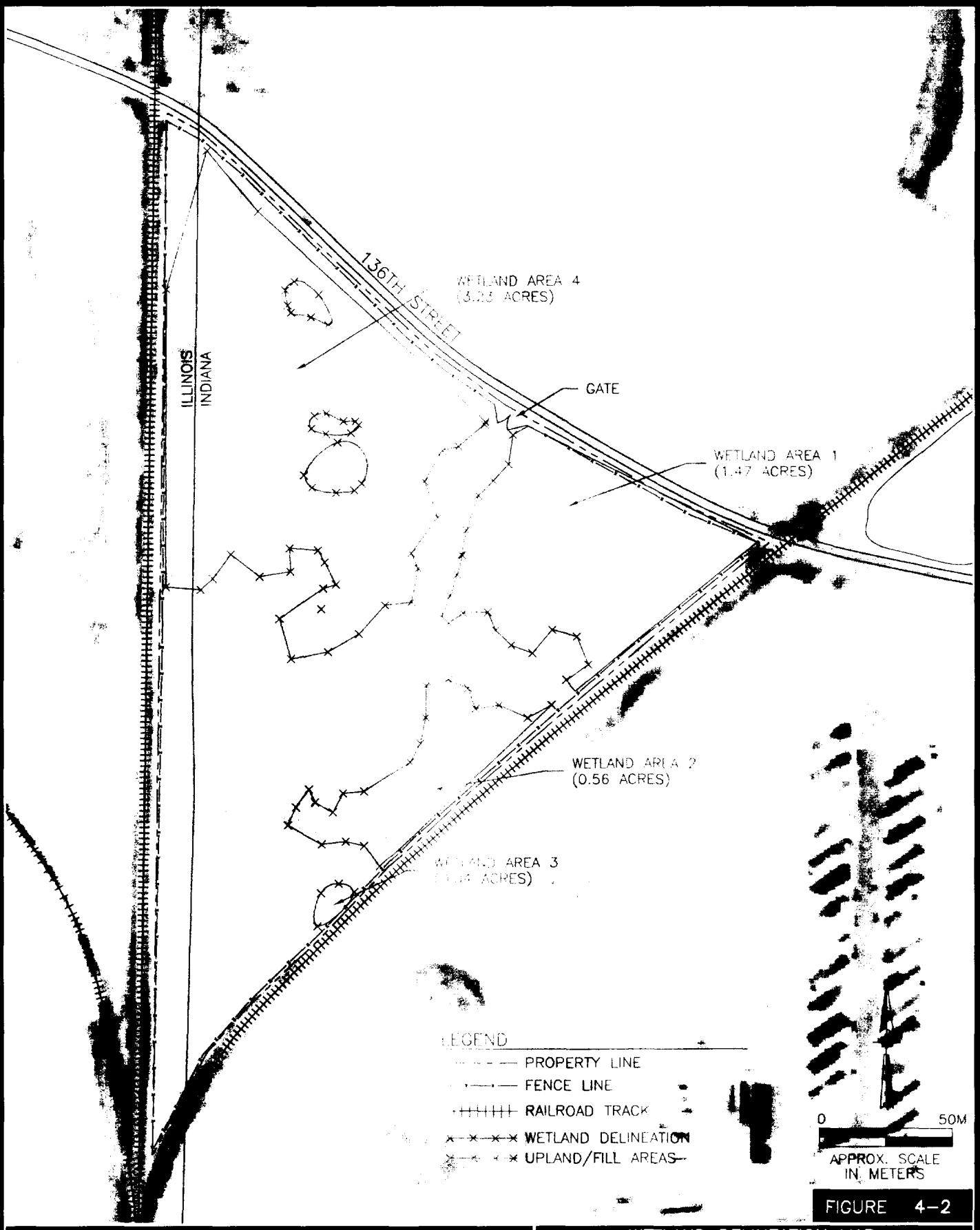

FIGURE 4-2

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WETLAND DELINEATION MAP
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Chicago, Illinois

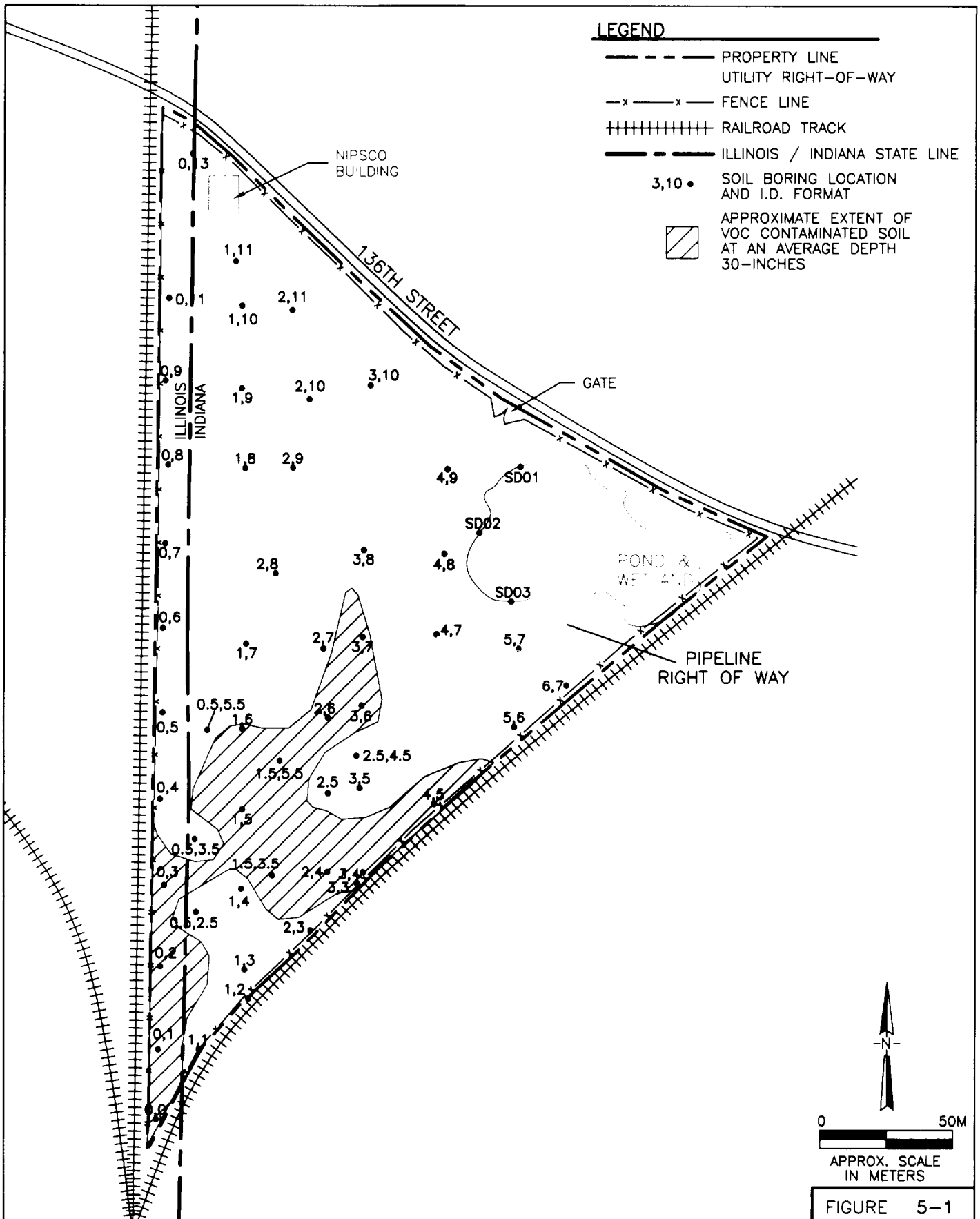

FIGURE 5-1

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EXTENT OF VOC CONTAMINATION MAP
CALUMET CONTAINER SITE
U.S. EPA
Chicago, Illinois

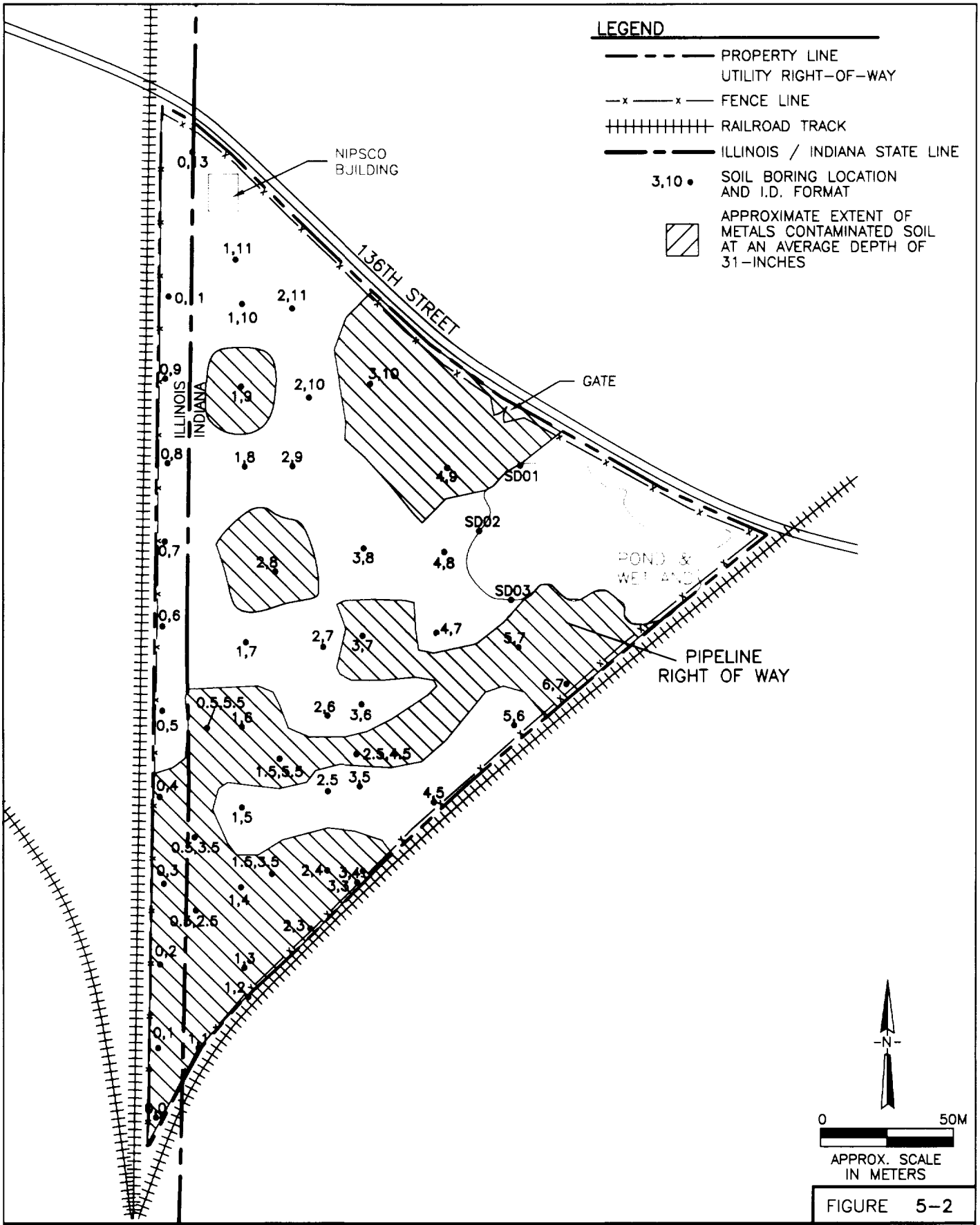


FIGURE 5-2

WESTON SOLUTIONS

750 E. Bunker Ct.
Suite 500
Vernon Hills, Illinois
60061

EXTENT OF METALS CONTAMINATION MAP
CALUMET CONTAINER SITE
U.S. EPA
Chicago, Illinois

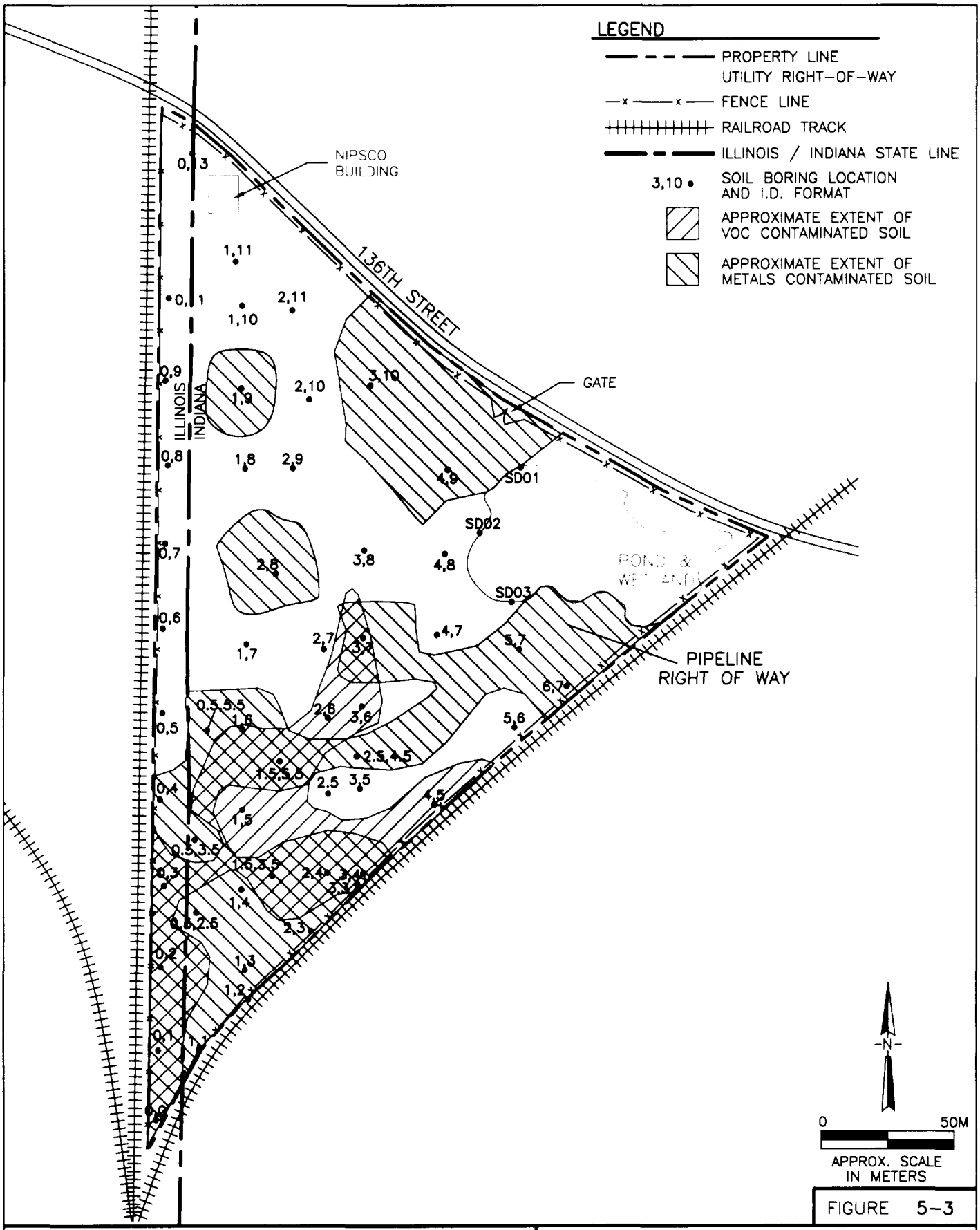


FIGURE 5-3

WESTON SOLUTIONS

750 E. Bunker Ct.
Suite 500
Vernon Hills, Illinois
60061

EXTENT OF CONTAMINATION MAP - COMINGLED WASTE
CALUMET CONTAINER SITE
U.S. EPA
Chicago, Illinois

TABLES

Table 4 - 1

Soil XRF Lead Screening Results
Calumet Container Site, Hammond, IN

Boring Location	Depth (feet)	Lead Result (ppm)	Precision +/-
0, 0	0.5	4,038	200
0, 0	3.0	<LOD	56.25
0, 1	1.0	930.4	81
0, 1	2.0	<LOD	62.1
0, 2	1.0	512.8	64.6
0, 3	1.0	966.4	89.9
0, 3	2.0	1,300	130
0, 4	0.5	1,140	180
0, 4	2.0	1,360	100
0, 5	0.5	561.6	63.8
0, 6	0.5	136.4	47.4
0, 6	3.0	<LOD	42.15
0, 7	1.0	<LOD	74.55
0, 8	0.0	56.8	37.8
0, 8	2.0	<LOD	40.5
0, 8	4.0	<LOD	55.5
0, 9	0.0	78.2	32.2
0, 9	2.0	<LOD	50.25
0, 9	4.0	<LOD	46.35
0, 10	0.0	<LOD	52.95
0, 10	1.0	<LOD	49.8
0, 10	3.0	<LOD	47.4
1, 1	0.5	518.8	55.8
1, 2	0.0	793.2	91.9
1, 2	1.5	<LOD	122.7
1, 2	2	4,288	260
1, 2	3	<LOD	48.3
2, 9	0.5	177.9	65.4
2, 9	3	<LOD	66.3
2, 10	1	80.2	45.6
2, 10	2	150.8	51.6
2, 10	4	68	40.9
2, 11	0	82.9	41.6
2, 11	1.5	<LOD	63.15
2, 11	2.5	<LOD	50.55
2, 11	4	<LOD	79.65
3, 3	0.5	1169.6	120

Boring Location	Depth (feet)	Lead Result (ppm)	Precision +/-
1, 7		121.9	68.6
1, 7	3	<LOD	40.35
1, 8	0.5	95.1	38.8
1, 8	2.5	51.2	32.2
1, 8	4	<LOD	46.95
1, 9	0	140.3	43.6
1, 9	1.5	146.6	60.2
1, 9	3.5	<LOD	51
1, 10	0	<LOD	51.75
1, 10	2	<LOD	54.75
1, 10	4	<LOD	40.05
2, 3	1	666.4	77.9
2, 3	2	1,400	130
2, 4	0.5	1189.6	150
2, 4	2	4649.6	290
2, 5	0.5	410.8	64.2
2, 5	2	177.9	69.5
2, 6	0.5	172.9	48
2, 6	2	42	27.5
2, 8	0	749.2	85.7
2, 8	1	243.4	69.2
2, 8	3	<LOD	54.6
2, 8	4	70.7	41.9
4, 9	2	265.6	76.2
5, 6	0	232.6	48.4
5, 6	1	139.3	39.3
5, 6	3.5	<LOD	39.9
5, 7	1	6848	240
5, 7	2.5	<LOD	43.05
6, 7	0.5	<LOD	43.2
6, 7	1	1659.2	130
6, 7	2.5	414	56.9
0.5, 2.5	0	660.8	83.3
0.5, 2.5	2	8057.6	400
0.5, 2.5	3	<LOD	60.3
0.5, 2.5	5	<LOD	57.6
0.5, 2.5	6.5	<LOD	48.3

Table 4 - 1

Soil XRF Lead Screening Results
Calumet Container Site, Hammond, IN

Boring Location	Depth (feet)	Lead Result (ppm)	Precision +/-
3, 3	3	<LOD	54.3
3, 4	1	58	38.5
3, 4	2.5	<LOD	54.75
3, 5	0.5	177.9	69.5
3, 5	2.5	678.8	68.8
3, 6	0.5	<LOD	85.35
3, 6	3	<LOD	58.5
3, 7	1	157.8	90.5
3, 7	3	<LOD	49.05
3, 8	0.5	752	74.4
3, 8	2.5	<LOD	51.75
3, 9	1	92.9	52.2
3, 9	3	<LOD	42.6
3, 10	0	134.1	56.2
3, 10	1	103.4	42.8
3, 10	3	180.7	61.8
3, 10	4	<LOD	56.1
4, 5	0.5	290.2	58.5
4, 7	1	<LOD	70.65
4, 7	2	<LOD	52.65
4, 8	1	130	60.3
4, 8	3	<LOD	56.85
4, 9	1	1469.6	120
1, 3	0.5	841.6	80.2
1, 3	2	86.6	41.4
1, 4	1	1868.8	94.7
1, 4	2	<LOD	60.45
1, 5	1	1969.6	120

Boring Location	Depth (feet)	Lead Result (ppm)	Precision +/-
0.5, 2.5	9	<LOD	56.7
0.5, 3.5	0	2560	200
0.5, 3.5	1	1840	150
0.5, 3.5	2.5	7974.4	490
0.5, 5	0.5	795.2	84.3
0.5, 5	1.5	1429.6	170
0.5, 5	2.5	601.6	92.9
0.5, 5	4	<LOD	55.2
1.5, 3.5	0	1960	140
1.5, 3.5	1	2689.6	210
1.5, 3.5	1.5	<LOD	51.45
1.5, 3.5	3	<LOD	51.75
1.5, 5.5	0	1840	140
1.5, 5.5	1.5	291.8	78.8
1.5, 5.5	3	<LOD	58.65
2.5, 4.5	0	972	98.4
2.5, 4.5	1	<LOD	52.2
2.5, 4.5	3	<LOD	53.4
SD-1	0.5	<LOD	50.55
SD-1	2	<LOD	43.5
SD-2	1	<LOD	51.9
SD-2	2	<LOD	41.85
SD-3	1	<LOD	46.35
SD-3	3	<LOD	49.8

ppm= parts per million
<LOD= Less than limit of detection

Table 4 - 2

XRF/Laboratory Confirmation Sampling Lead Analysis Results
Calumet Container Site, Hammond, IN

Sample ID	CC (SD-02)	CC (0,10)	CC (0,10)	CC (0.5,2.5)	CC (1,2)	CC (1,8)	CC (1,9)	CC (1,9)
Sample Type	sediment	soil	soil	soil	soil	soil	soil	soil
Date Sampled	5/20/2002	5/20/2002	5/20/2002	5/20/2002	5/20/2002	5/20/2002	5/20/2002	5/20/2002
Depth	(0-1')	(3'-4')	(3'-4')DUP	(1'-2')	(2-3')	(3'-4')	(3'-4')	(3'-4')DUP
Analysis								
Lead (mg/kg)	47.7	2.8	3.15	6,520	1,490.00	680	13,000	13,000
XRF Reading (ppm, mg/kg)	< LOD	< LOD	< LOD	8057.6	4288.0	51.2	361.2	361.2
XRF Precision	N.A.	N.A.	N.A.	400.0	260.0	32.2	68.8	68.8
XRF Sample Number	5	29	29	60	57	43	21	21
Relative Percent Difference	N.A.	N.A.	N.A.	11	48	86	95	95

Sample concentrations flagged with U were below method detection limits
Sample concentrations flagged with J are estimated
N.A. = Not applicable
mg/kg = milligrams per kilogram = parts per million (ppm)
<LOD= Less than level of deduction

Table 4 - 2

XRF/Laboratory Confirmation Sampling Lead Analysis Results
Calumet Container Site, Hammond, IN

Sample ID	**CC (2,8)**	**CC (2,8)**	**CC (3-7)**	**CC (3-8)**	**CC (3,10)**	**CC (4,7)**	**CC (5,6)**	**CC (6,7)**
Sample Type	**soil**	**soil**	**soil**	**soil**	**soil**	**soil**	**soil**	**soil**
Date Sampled	**5/20/2002**	**5/20/2002**	**5/1/2002**	**5/1/2002**	**5/20/2002**	**5/1/2002**	**5/20/2002**	**5/20/2002**
Depth	**(0-6")**	**(2'-4')**	**1-2'**	**0-1'**	**(0-2')**	**1-2'**	**(0-6")**	**(3'-4')**
Analysis								
Lead (mg/kg)	155	1,400	133	805	4,300	30.5	280	1,320
XRF Reading (ppm, mg/kg)	749.2	< LOD	157.8	752.0	134.1	< LOD	139.3	1659
XRF Precision	85.7	N.A.	90.5	74.4	56.2	N.A.	39.3	130
XRF Sample Number	38	40	53	61	47	51	15	12
Relative Percent Difference	66	N.A.	9	3	94	N.A.	34	11

Sample concentrations flagged with U were below method detection limits
Sample concentrations flagged with J are estimated
N.A. = Not applicable
mg/kg = milligrams per kilogram = parts per million (ppm)
<LOD= Less than level of deduction

Table 4 - 3

Surface and Subsurface Soil and Sediment Lead and TAL Metals Sampling Results
Calumet Container Site, Hammond, IN

Sample ID	CC (SD-02)	CC (0,10)	CC (0,10)	CC (0.5,2.5)	CC (1,2)	CC (1,8)	CC (1,9)	Screening Level Industrial		
Sample Type	sediment	soil	soil	soil	soil	soil	soil			
Date Sampled	5/20/2002	5/20/2002	5/20/2002	5/20/2002	5/20/2002	5/20/2002	5/20/2002			
Depth	0-1'	3'-4'	3'-4' DUP	1'-2'	2-3'	3'-4'	3'-4'			
Chemical Name								Region IX[a]	RISC[b]	TACO[c]
Aluminum (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	3.90 U	3.90 U	**100,000**	N.L.	N.L.
Antimony (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	4.36	2.11	818	**620**	820[e]
Arsenic (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	14	3.90	439	**20**	1,200[d]
Barium (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	0.33 U	0.33 U	100,000	**98,000**	N.L.
Beryllium (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	0.33 U	0.33 U	**2,240**	2,900	2,100[d]
Cadmium (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	2,000	**21,000**	809	780	2,000[e]
Calcium (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	3.10	2.70	N.L.	N.L.	N.L.
Chromium (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	1.00	1.50	448	N.L.	**420[d]**
Cobalt (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	4.80	2.20	**100,000**	N.L.	120,000[e]
Copper (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	2,800	2,000	75,908	**57,000**	82,000[e]
Iron (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	5.85	3.73	**100,000**	N.L.	N.L.
Lead (mg/kg)	47.7	2.8	3.15	**6,520**	**1,490**	680	**13,000**	750	1,300	400[e]
Magnesium (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	20	91	N.L.	N.L.	N.L.
Manganese (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	0.03 U	0.03 U	**32,300**	N.L.	91,000[d]
Mercury (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	3.3	2.8	613	**150**	610[e]
Nickel (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	120	130	40,877	31,000	**21,000[d]**
Potassium (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	0.46 U	0.46 U	N.L.	N.L.	N.L.
Silver (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	66 U	75	10,220	**7,800**	10,000[e]
Sodium (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	0.33 U	0.33 U	N.L.	N.L.	N.L.
Thallium (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	4.3	2.9	**135**	140	160[e]
Vanadium (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	16	10	14,308	N.L.	**14,000[e]**
Zinc (mg/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	**100,000**	470,000	610,000[e]

Lead results compared to criteria level at 1,000 mg/kg; cadmium results compared to criteria level at 10,000 mg/kg.

[a] U.S. EPA Region IX Industrial PRGs for Combined Exposure Pathways

[b] Indiana RISC closure levels, direct contact soils

[c] Illinois EPA Tiered Approach to Corrective Action Objectives (TACO)

[d] TACO Exposure Route-Specific Values for Soils, Industrial - Commercial, Inhalation

[e] TACO Exposure Route-Specific Values for Soils, Industrial - Commercial, Ingestion

Bold and highlighted sample concentrations are higher than the most conservative industrial criteria level for that compound

Highlighted criteria levels are the most conservative of those listed for industrial soils

Sample concentrations flagged with U were below method detection limits

Sample concentrations flagged with J are estimated

N.L. = Not listed

N.A. = Not analyzed

mg/kg = milligrams per kilogram

Table 4 - 3

Surface and Subsurface Soil and Sediment Lead and TAL Metals Sampling Results
Calumet Container Site, Hammond, IN

Sample ID	CC (1,9)	CC (2,8)	CC (2,8)	CC (3-7)	CC (3-8)	CC (3,10)	CC (4,7)	CC (5,6)	CC(6,7)	Screening Level Industrial		
Sample Type	soil	soil	soil	soil	soil	soil	soil	soil	soil			
Date Sampled	5/20/2002	5/20/2002	5/20/2002	5/1/2002	5/1/2002	5/20/2002	5/1/2002	5/20/2002	5/20/2002			
Depth	3'-4'DUP	0-6"	2'-4'	1-2'	0-1'	0-2'	1-2'	0-6"	3'-4'			
Chemical Name										Region IX[a]	RISC[b]	TACO[c]
Aluminum (mg/kg)	4 U	N.A.	4 U	5,600	2,000	4 U	2,200	N.A.	5,200	**100,000**	N.L.	N.L.
Antimony (mg/kg)	2.06 U	N.A.	21.50	45 U	4.6 U	13.50	4.6 U	N.A.	8.6	818	**620**	820[e]
Arsenic (mg/kg)	3.80 U	N.A.	**[illegible]5**	**64.9**	14.4	**280**	6.5	N.A.	6.86	439	**20**	1,200[d]
Barium (mg/kg)	0.33 U	N.A.	0.33 U	71	160	0.38	28	N.A.	610	100,000	**98,000**	N.L.
Beryllium (mg/kg)	0.33 U	N.A.	0.66	3.75 U	0.345	0.64	0.4 U	N.A.	1.06	**2,240**	2,900	2,100[d]
Cadmium (mg/kg)	**22,000**	N.A.	6,300	3.75 U	2.64	**27,000**	0.4 U	N.A.	4.12	809	780	2,000[e]
Calcium (mg/kg)	2.90	N.A.	4.50	93,000	88,000	20	12,000	N.A.	32000	N.L.	N.L.	N.L.
Chromium (mg/kg)	1.40	N.A.	2.10	**780**	170	3.50	9.4	N.A.	210	448	N.L.	**420[d]**
Cobalt (mg/kg)	2.40	N.A.	37	6.7	6.6	27	1.9	N.A.	9.4	**100,000**	N.L.	120,000[e]
Copper (mg/kg)	2,100	N.A.	12,000	28	140	19,000	15.0	N.A.	190	75,908	**57,000**	82,000[e]
Iron (mg/kg)	3.36	N.A.	51.8	**120,000**	19,000	161	8,100	N.A.	8,200	**100,000**	N.L.	N.L.
Lead (mg/kg)	**13,000**	155	**1,400**	133	805	**4,300**	30.5	280	**1,320**	750	1,300	400[e]
Magnesium (mg/kg)	93	N.A.	91	37,000	49,000	1,300	5,100	N.A.	9400	N.L.	N.L.	N.L.
Manganese (mg/kg)	0.03 U	N.A.	0.06	25,000	1,800	0.11	450	N.A.	840	**32,300**	N.L.	91,000[d]
Mercury (mg/kg)	2.9	N.A.	9	0.3	0.96	14	0.08	N.A.	.58	613	**150**	610[e]
Nickel (mg/kg)	130	N.A.	160	15 U	12	350	4.9	N.A.	9.8	40,877	31,000	**21,000[d]**
Potassium (mg/kg)	0.47 U	N.A.	0.56	750 U	440	0.47 U	220	N.A.	640	N.L.	N.L.	N.L.
Silver (mg/kg)	72	N.A.	66 U	3.7 U	1.2	190	0.38 U	N.A.	1.6	10,220	**7,800**	10,000[e]
Sodium (mg/kg)	0.33 U	N.A.	1.09	750 U	160	2.16	76.0 U	N.A.	400	N.L.	N.L.	N.L.
Thallium (mg/kg)	2.8	N.A.	7.1	12.9	1.29	13	0.609	N.A.	0.331 U	**135**	140	160[e]
Vanadium (mg/kg)	9.80	N.A.	160	240	38	530	7.0	N.A.	10	14,308	N.L.	**14,000[e]**
Zinc (mg/kg)	N.A.	N.A.	N.A.	38	260	N.A.	62.0	N.A.	680	**100,000**	470,000	610,000[e]

****Lead results compared to criteria level at 1,000 mg/kg; cadmium results compared to criteria level at 10,000 mg/kg.****

[a] U.S. EPA Region IX Industrial PRGs for Combined Exposure Pathways

[b] Indiana RISC closure levels, direct contact soils

[c] Illinois EPA Tiered Approach to Corrective Action Objectives (TACO)

[d] TACO Exposure Route-Specific Values for Soils, Industrial - Commercial, Inhalation

[e] TACO Exposure Route-Specific Values for Soils, Industrial - Commercial, Ingestion

Bold and highlighted sample concentrations are higher than the most conservative industrial criteria level for that compound

Highlighted criteria levels are the most conservative of those listed for industrial soils

Sample concentrations flagged with U were below method detection limits

Sample concentrations flagged with J are estimated

N.L. = Not listed

N.A. = Not analyzed

mg/kg = milligrams per kilogram

Table 4 -4

Surface and Subsurface Soil Volatile Organic Compounds Sampling Results
Calumet Container Site, Hammond, IN

Sample ID	CC-(0,0)	CC-(0,1)	CC-(0,2)	CC-(0,3)	CC-(0,4)	CC-(0.5,2.5)	CC-(1,2)	CC-(1,3)	CC-(1,5)	CC-(1,7)	Screening Level Industrial		
Sample Type	soil	soil	soil	soil	soil	soil	soil	soil	soil	soil			
Depth	1'-2'	1'-2'	1'-2'	1'-2'	1'-2'	3'-4'	2'-3'	1'-2'	1'-2'	1'-2'			
Date Sampled	4/30/2002	4/30/2002	4/30/2002	4/30/2002	4/30/2002	5/21/2002	5/21/2002	4/30/2002	4/30/2002	5/1/2002			
Chemical Name											Region IX[a]	RISC[b]	TACO[c,d]
1,2,4-Trichlorobenzene (ug/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	20 J	3,000,000	4,900,000	3,200,000
1,2,4-Trimethylbenzene (ug/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	300	170,000	N.L.	N.L.
1,2-Dichloropropane (ug/kg)	3,300 U	3,300 U	3,300 U	3,300 U	3,300 U	N.A.	N.A.	3,300 U	32,000 U	15 U	800	7,200	23,000
1,3,5-Trimethylbenzene (ug/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	100	69,800	N.L.	N.L.
Acetone (ug/kg)	33,000 U	33,000 U	33,000 U	33,000 U	33,000 U	N.A.	N.A.	33,000 U	320,000 U	75 U	6,220,000	5,600,000	100,000,000
Benzene (ug/kg)	3,300 U	3,300 U	3,300 U	3,300 U	3,300 U	1,100 U	1,200 U	3,300 U	32,000 U	19	1,500	13,000	1,600
2-Butanone (ug/kg)	33,000 U	33,000 U	33,000 U	33,000 U	33,000 U	N.A.	N.A.	33,000 U	N.A.	75 U	N.L.	N.L.	N.L.
Ethylbenzene (ug/kg)	51,000	**750,000**	**620,000**	**390,000**	2,900 U	56,000	45,000	59,000	**970,000**	370	230,000	6,800,000	400,000
Isopropylbenzene (Cumene) (ug/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	24	522,000	N.L.	N.L.
m/p-xylene (total xylenes) (ug/kg)	**240,000**	**4,200,000**	**2,300,000**	**1,700,000**	16,000	87,000	1,200 U	87,000	**3,200,000**	1800	210,000	6,200,000	320,000
Naphthalene (ug/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	40 J	N.L.	8,000,000	270,000
n-Butylbenzene (ug/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	44	240,000	N.L.	N.L.
n-Propylbenzene (ug/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	39	240,000	N.L.	N.L.
o-xylene (ug/kg)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	570	N.L.	N.L.	410,000
p-isopropyltoluene	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	15 U	N.L.	N.L.	N.L.
Styrene	3,300 U	30,000 U	29,000 U	14,000 U	2,900 U	N.A.	N.A.	6,300 U	32,000 U	16	1,700,000	16,000,000	1,500,000
Tetrachloroethene	3,300 U	30,000 U	29,000 U	14,000 U	2,900 U	N.A.	N.A.	6,300 U	32,000 U	17	N.L.	N.L.	N.L.
Toluene (ug/kg)	3,300 U	**8,400,000**	**3,600,000**	22,000	2,900 U	1,700	12,000	6,300 U	**1,200,000**	1,500	520,000	2,200,000	650,000

This table lists only compounds that were detected during analysis. See Appendix C for complete laboratory reports.

[a] U.S. EPA Region IX Industrial PRGs for Combined Exposure Pathways

[b] Indiana RISC closure levels, direct contact soils

[c] Illinois EPA Tiered Approach to Corrective Action Objectives (TACO)

[d] TACO Exposure Route-Specific Values for Soils, Industrial - Commercial, Inhalation

Bold and highlighted sample concentrations are higher than the most conservative industrial criteria level for that compound

Highlighted screening levels are the most conservative of those listed for industrial soils

Sample concentrations flagged with U were below method detection limits

Sample concentrations flagged with J are estimated

N.L. = Not listed

N.A. = Not analyzed

ug/kg = micrograms per kilogram

Table 4 -4

Surface and Subsurface Soil Volatile Organic Compounds Sampling Results
Calumet Container Site, Hammond, IN

Sample ID	CC-(2,3)	CC-(2,4)	CC- (2,8)	CC-(3,5)	CC- (3,10)	CC-(5,7)	CC-(6,7)	Screening Level Industrial		
Sample Type	soil	soil	soil	soil	soil	soil	soil			
Depth	1'-2'	1'-2'	2'-4'	1'-2'	0-2'	1'-2'	3'-4'			
Date Sampled	4/30/2002	5/1/2002	5/20/2002	5/1/2002	5/21/2002	5/1/2002	5/20/2002			
Chemical Name								Region IX[a]	RISC[b]	TACO[c,d]
1,2,4-Trichlorobenzene (ug/kg)	N.A.	8,000 J	170 U	16 U	7 U	16 UJ	1,300 U	3,000,000	4,900,000	3,200,000
1,2,4-Trimethylbenzene (ug/kg)	N.A.	410 U	670	19	17	88	18,000	170,000	N.L.	N.L.
1,2-Dichloropropane (ug/kg)	2,700 U	**2,600**	170 U	16 U	7 U	16 U	1,300 U	800	7,200	23,000
1,3,5-Trimethylbenzene (ug/kg)	N.A.	410 U	200	16 U	32	24	5,600	69,800	N.L.	N.L.
Acetone (ug/kg)	27,000 U	2,000 U	870 U	80 U	180	80 U	6,500 U	6,220,000	5,600,000	100,000,000
Benzene (ug/kg)	2,700 U	410 U	170 U	16 U	7 U	16 U	1,300 U	1,500	13,000	1,600
2-Butanone (ug/kg)	27,000 U	2,000 U	870 U	80 U	140	80 U	6,500 U	N.L.	N.L.	N.L.
Ethylbenzene (ug/kg)	21,000	1,600	550	51	7 U	200	14,000	230,000	6,800,000	400,000
Isopropylbenzene (Cumene) (ug/kg)	N.A.	410 U	170 U	16 U	7 U	16 U	1,100	522,000	N.L.	N.L.
m/p-xylene (total xylenes) (ug/kg)	66,000	7,600	2,200	180	71	640	57,000	210,000	6,200,000	320,000
Naphthalene (ug/kg)	N.A.	1,100 J	580	16 UJ	12	29 J	8,600	N.L.	8,000,000	270,000
n-Butylbenzene (ug/kg)	N.A.	920	220	16 U	7 U	16 U	2,400	240,000	N.L.	N.L.
n-Propylbenzene (ug/kg)	N.A.	700	170 U	16 U	7 U	16 U	2,000	240,000	N.L.	N.L.
o-xylene (ug/kg)	N.A.	3,400	740	48	52	210	18,000	N.L.	N.L.	410,000
p-isopropyltoluene	N.A.	510	170 U	16 U	7 U	16 U	1,300	N.L.	N.L.	N.L.
Styrene	2,700 U	410 U	170 U	16 U	7 U	16 U	1,300 U	1,700,000	16,000,000	1,500,000
Tetrachloroethene	2,700 U	410 U	170 U	16 U	7 U	16 U	1,300 U	N.L.	N.L.	N.L.
Toluene (ug/kg)	6,900	940	170 U	240	7 U	850	1,200	520,000	2,200,000	650,000

This table lists only compounds that were detected during analysis. See Appendix C for complete laboratory reports.

[a] U.S. EPA Region IX Industrial PRGs for Combined Exposure Pathways

[b] Indiana RISC closure levels, direct contact soils

[c] Illinois EPA Tiered Approach to Corrective Action Objectives (TACO)

[d] TACO Exposure Route-Specific Values for Soils, Industrial - Commercial, Inhalation

Bold and highlighted sample concentrations are higher than the most conservative industrial criteria level for that compound

Highlighted screening levels are the most conservative of those listed for industrial soils

Sample concentrations flagged with U were below method detection limits

Sample concentrations flagged with J are estimated

N.L. = Not listed

N/A = Not Analyzed

ug/kg = micrograms per kilogram

Table 4 -5

Surface and Subsurface Soil Semi-Volatile Organic Compounds Sampling Results
Calumet Container Site, Hammond, IN

Sample ID	CC-(0,3)	CC-(0,4)	CC-(1,3)	CC-(1,7)	CC-(2,4)	CC-(2, 8)	CC-(3,5)	CC-(3,10)	CC-(5,7)	CC-(6,7)	Screening Level Industrial		
Sample Type	soil	soil	soil	soil	soil	soil	soil	soil	soil	soil			
Depth	1'-2'	1'-2'	1'-2'	1'-2'	1'-2'	2'-4'	1'-2'	0'-2'	1'-2'	3'-4'			
Date Sampled	5/1/2002	5/1/2002	5/15/2002	5/1/2002	5/1/2002	5/20/2002	5/1/2002	5/21/2002	5/1/2002	5/20/2002			
Chemical Name											Region IX[a]	RISC[b]	TACO[c,d]
2-Methylnaphthalene (ug/kg)	2,200 U	2,000 U	2,300 U	4,700	2,200 U	9,200 U	2,100 U	8,700 U	2,200 U	8,700 U	N.L.	N.L.	N.L.
bis-(2-ethylhexyl)phthalate (ug/kg)	14,000	12,000	2,300 U	12,000	2,200 U	9,200 U	7,300	8,700 U	2,200 U	8,700 U	**180,000**	980,000	31,000,000
Naphthalene (ug/kg)	2,200 U	2,000 U	2,300 U	8,300	2,200 U	9,200 U	2,100 U	8,700 U	2,200 U	8,700 U	N.L.	8,000,000	**270,000**

This table lists only compounds that were detected during analysis. See Appendix C for complete laboratory reports.

[a] U.S. EPA Region IX Industrial PRGs for Combined Exposure Pathways

[b] Indiana RISC closure levels, direct contact soils

[c] Illinois EPA Tiered Approach to Corrective Action Objectives (TACO)

[d] TACO Exposure Route-Specific Values for Soils, Industrial - Commercial, Inhalation

Bold and highlighted sample concentrations are higher than the most conservative industrial criteria level for that compound
Highlighted screening levels are the most conservative of those listed for industrial soils
Sample concentrations flagged with U were below method detection limits
Sample concentrations flagged with J are estimated
N.L. = Not listed
N.A. = Not analyzed
ug/kg = micrograms per kilogram

Table 4 - 6

Surface Soil Pesticides Sampling Results
Calumet Container Site, Hammond, IN

Sample ID	CC (0,3)	CC (0,4)	CC (1,3)	CC (1,7)	CC (2,4)	CC (2,8)	CC (3,5)	CC (3,10)	CC (5,7)	CC (6,7)	Criteria Level Industrial		
Sample Type	soil	soil	soil	soil	soil	soil	soil	soil	soil	soil			
Date Sampled	5/1/2002	5/1/2002	5/1/2002	5/1/2002	5/1/2002	5/20/2002	5/1/2002	5/21/2002	5/1/2002	5/20/2002			
Depth	1'-2'	1'-2'	1'-2'	1'-2'	1'-2'	2'-4'	1'-2'	0-2'	1'-2'	3'-4'			
Chemical Name											Region IX[a]	RISC[b]	TACO[c]
Aldrin (ug/kg)	4.3 UJ	4.0 UJ	4.6 UJ	25 J	4.3 UJ	2.3 U	4.3 U	2.3 U	4.3 UJ	2.2 U	**145**	800	6,600[d]
alpha-BHC (ug/kg)	4.3 UJ	4.0 UJ	4.6 UJ	4.0 UJ	4.3 UJ	2.2 U	4.3	2.2 U	4.3 UJ	2.2 U	**594**	4,000	1,500[d]
beta-BHC (ug/kg)	4.3 UJ	4.0 UJ	4.6 UJ	4.0 UJ	4.3 UJ	2.3 U	4.3 U	2.2 U	4.3 UJ	2.2 U	**2,080**	14,000	N.L.
Chlordane (Technical)	75 J	84 J	41 J	8.0 UJ	15 J	4.6 U	94	17	8.7 J	80	**11,000**	68,000	140,000[d]
delta-BHC (ug/kg)	4.3 UJ	4.0 UJ	4.6 UJ	4.0 UJ	4.3 UJ	2.3 U	4.3 U	2.2 U	4.3 UJ	2.2 U	N.L.	N.L.	N.L.
gamma-BHC (Lindane) (ug/kg)	4.3 UJ	4.0 UJ	4.6 UJ	4.0 UJ	4.3 UJ	2.3 U	4.3 U	2.2	4.3 UJ	2.2 U	**2,881**	19,000	4,000[e]
4,4'-DDD (ug/kg)	8.7 UJ	8.1 UJ	9.2 UJ	8.0 UJ	8.6 UJ	4.6 U	8.6 U	4.3 U	8.7 UJ	4.3 U	**17,078**	120,000	24,000[e]
4,4'-DDE (ug/kg)	8.7 UJ	8.1 UJ	9.2 UJ	8.0 UJ	8.6 UJ	50	8.6 U	4.3 U	8.7 UJ	4.3 U	**12,055**	86,000	17,000[e]
4,4'-DDT (ug/kg)	210 J	220 J	66 J	64 J	38 J	78	8.6 U	4.3 U	14 J	61	**12,055**	86,000	1,500,000[d]
Dieldrin (ug/kg)	8.7 UJ	8.1 UJ	9.2 UJ	8.0 UJ	8.6 UJ	4.6 U	8.6 U	2.3	8.7 UJ	4.3 U	**154**	860	2,200[d]
Endosulfan I (ug/kg)	4.3 UJ	4.0 UJ	4.6 UJ	4.0 UJ	4.3 UJ	2.3 U	4.3 U	15	4.3 UJ	26	5,285,514	2,900,000	12,000,000[e]
Endosulfan II (ug/kg)	8.7 UJ	8.1 UJ	9.2 UJ	8.0 UJ	8.6 UJ	4.6 U	8.6 U	4.3 U	8.7 UJ	4.3 U	N.L.	N.L.	N.L.
Endosulfan sulfate (ug/kg)	8.7 UJ	8.1 UJ	9.2 UJ	8.0 UJ	8.6 UJ	4.6 U	8.6 U	4.3 U	8.7 UJ	4.3 U	N.L.	N.L.	N.L.
Endrin (ug/kg)	8.7 UJ	8.1 UJ	9.2 UJ	8.0 UJ	8.6 UJ	4.6 U	8.6 U	4.3 U	8.7 UJ	4.3 U	264,276	150,000	610,000[e]
Endrin aldehyde (ug/kg)	8.7 UJ	8.1 UJ	9.2 UJ	8.0 UJ	8.6 UJ	4.6 U	8.6 U	4.3 U	8.7 UJ	4.3 U	N.L.	N.L.	N.L.
Endrin ketone (ug/kg)	8.7 UJ	8.1 UJ	9.2 UJ	8.0 UJ	8.6 UJ	4.6 U	8.6 U	4.3 U	8.7 UJ	4.3 U	N.L.	N.L.	N.L.
Heptachlor (ug/kg)	4.3 UJ	4.0 UJ	4.6 UJ	4.0 UJ	4.3 UJ	2.3 U	4.3 U	2.2 U	4.3 UJ	2.2 U	**548**	1,200	11,000[d]
Heptachlor epoxide (ug/kg)	4.3 UJ	4.0 UJ	4.6 UJ	4.0 UJ	4.3 UJ	2.3 U	4.3 U	2.2 U	4.3 UJ	2.2 U	**271**	1,500	9,200[d]
Methoxychlor (ug/kg)	44 UJ	41 UJ	46 UJ	40 UJ	43 UJ	23 U	43 U	22 U	44 UJ	2.2 U	4,404,595	2,500,000	10,000,000[e]
Toxaphene (ug/kg)	87 UJ	81 UJ	92 UJ	80 UJ	86 UJ	46 U	86 U	43 U	87 UJ	43 U	**2,242**	12,000	170,000[d]

[a] U.S. EPA Region IX Industrial PRGs for Combined Exposure Pathways
[b] Indiana RISC closure levels, direct contact soils
[c] Illinois EPA Tiered Approach to Corrective Action Objectives (TACO)
[d] TACO Exposure Route-Specific Values for Soils, Industrial - Commercial, Inhalation
[e] TACO Exposure Route-Specific Values for Soils, Industrial - Commercial, Ingestion
Bold and highlighted sample concentrations are higher than the most conservative industrial criteria level for that compound
Highlighted criteria levels are the most conservative of those listed for industrial soils
Sample concentrations flagged with U were below method detection limits
Sample concentrations flagged with J are estimated
N.L. = not listed
ug/kg = micrograms per kilogram

Table 4-7

Risk Indices for Residential Land Use, Carcinogenic and Non-Carcinogenic Endpoints, Inhalation and Ingestion Exposure Pathways
Calumet Container Site, Hammond IN

	Parameter	Risk Pathway	Range of Risk Index low		high
Residential/ Carcinogenic	arsenic	Ing	9.16x10-6	to	**6.58x10-4**
	arsenic	Inh	5.22x10-9	to	3.75x10-7
	cadmium	Inh	1.06x10-10	to	1.51.x10-5
	chromium	Inh	3.74x10-9	to	2.91x10-6
	1,2-dichloropropane	Ing	0	to	[illegible]
	1,2-dichloropropane	Inh	0	to	[illegible]
	benzene	Ing	0	to	3.65x10-7
Residential/ Non-Carcinogenic	arsenic	Ing	1.78x10-2	to	**1.28**
	cadmium	Ing	2.6x10-4	to	**37**
	chromium	Ing	4.57x10-4	to	3.56x10-1
	ethylbenzene	Ing	3.62x10-5	to	**9.49**
	m-p-xyelene	Ing	3.47x10-5	to	**2.05**
	o-xylene	Ing	0	to	8.81x10-3
	toluene	Ing	1.81x10-5	to	**41.1**

Highlighted carcinogenic risk indices indicated that there is a high level risk present (greater than 1x10-4)
Highlighted non-carcinogenic risk indices indicate that there is a risk present (greater than one).
Ing = ingestion risk
Inh = inhalation risk

APPENDIX A

GEOPROBE BORING LOGS

LOG OF BORING 0,0

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 4/30/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 41

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL with heavy staining from 21 to 24"			
3						
6						
9				1	2	XRF - Pb = 4038.4 +/- 200 ppm
12		AR				
15						
18						
21						
24			Oil stained SAND with some gravel			VOCs = 109 ppm
27		SW				
30						
33		AR	Gravel FILL			
36		SW	Light brown SAND	2	4	XRF - Pb = below detectable limit
39		SW	Black SAND			VOCs = 8 ppm
42			Core completed at 41 inches bgs.			
45						
48						

08-15-2002 K:\Calumet Container START\Boring Logs\0.0.BOR

LOG OF BORING 0,1

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 4/30/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 29
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			Dark brown FILL with silty soil and some fine sand			
3						
6						
9						
12		AR		1	1	VOCs = 1385 ppm XRF - Pb = 930.4 +/- 81.0 ppm
15						
18						
21						
24		SW	Brown to dark brown very fine SAND	2	1	XRF - Pb = below detectable limit
27						
30			Core completed at 29 inches bgs.			
33						
36						
39						
42						
45						
48						

LOG OF BORING 0,2

U.S. Environmental Protection Agency
Calumet Container

Date Drilled : 4/30/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 33

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	Brown FILL material with light blue paint at 12"	1	3	XRF - Pb = 512.8 +/- 64.6 ppm VOCs = 8.6 ppm
21		OL	Black stained SOIL			
24		SW	Black stained SAND	2	2	XRF - Pb = 103.4 +/- 47.7 ppm
33			Core completed at 33 inches bgs.			

3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48

08-15-2002 K:\Calumet Container START\Boring Logs\0.2.BOR

LOG OF BORING 0,3

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 4/30/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 45
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		OL	Organic SOIL			
3						
6		AR	FILL			
9						
12				1	1	XRF - Pb = 966.4 +/- 89.9 ppm
15						
18						
21						
24						VOCs = 1163 ppm
27				2	1	XRF - Pb = 1300.0 +/-130.0 ppm
30		SW	Black stained, oily SAND			
33						
36		SW	Gray SAND			
39						
42						
45			Core completed at 45 inches bgs.			
48						

LOG OF BORING 0,4

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 4/30/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 37

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0–3		OL	Organic SOIL			
6–21		SW	Light brown gravelly SAND	1	1	XRF - Pb = 1140.0 +/- 180.0 ppm VOCs = 37 ppm
24–36		SW	Black stained SAND with white soft material	2	1	XRF - Pb = 1360.00 +/- 100.0 ppm

Core completed at 37 inches bgs.

LOG OF BORING 0,5

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 4/30/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 18
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0						
3			FILL			
6		AR		1	2	XRF- Pb = 561.6 +/- 63.8 ppm
9						
12			Fine Dark brown SAND			
15		SW				
18			Core completed at 18 inches bgs.			
21						
24						
27						
30						
33						
36						
39						
42						
45						
48						

LOG OF BORING 0,6

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 4/30/02	Borehole Diameter (in.): 3
Drilling Method	: Geoprobe	Total Recovery (in.) : 36
Drilled By	: EPA	
Logged By	: Don Paxton	
X, Y Coordinates	:	

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL			
3						
6						
9		AR		1	1	XRF - Pb = 136.4 +/- 47.4 ppm
12						
15						
18			Fine gray SAND wet			
21						
24						
27		SW				
30						
33				2	1	XRF - Pb = below detectable limit
36			Core completed at 36 inches bgs.			
39						
42						
45						
48						

08-13-2002 K:\Calumet Container START\Boring Logs\0.6.BOR

LOG OF BORING 0,7

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/1/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 19
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		OL	Silty CLAY			
3		SW	Brown SAND with red staining	1	1	XRF - Pb = below detectable limit
6						
9						
12						
15						
18						
21			Core completed at 19 inches bgs.			
24						
27						
30						
33						
36						
39						
42						
45						
48						

LOG OF BORING 0,8

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/20/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 34

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	Black silty sand FILL with some gravel, moist	1	1	XRF - Pb = 56.8 +/- 37.8 ppm
18		SW	Greyish SAND, moist	2	1	XRF - Pb = below detectable limit
33				3	1	XRF - Pb = below detectable limit
34			Core completed at 34 inches bgs.			

Depth scale: 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48

08-13-2002 K:\Calumet Container START\Boring Logs\0.8.BOR

LOG OF BORING 0,9

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/20/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 30
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0–3		AR	Black organic soil FILL with roots, moist	1	1	XRF - Pb = 78.2 +/- 32.2 ppm
6–12		SP	Brown SAND with rocks, moist			
15–18		PT	Black organic PEAT	2	1	XRF - Pb = below detectable limit
21–27		SW	Brwn to gray fine SAND, moist			
30				3	1	XRF - Pb = below detectable limit

Core completed at 30 inches bgs.

Depth in Inches: 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48

08-13-2002 K:\Calumet Container START\Boring Logs\0.9.BOR

LOG OF BORING 0,10

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/20/02	Borehole Diameter (in.): 3
Drilling Method	: Geoprobe	Total Recovery (in.) : 27
Drilled By	: EPA	
Logged By	: Don Paxton	
X, Y Coordinates	:	

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0						
		AR	FILL with brownish sand and some gravel	1	1	XRF - Pb = below detectable limit
3						
6						
		PT	Blackish organic PEAT			
9						
12						
				2	1	XRF - Pb = below detectable limit
			Greyish organic fine SILT			
15						
18						
		OL		3	1	XRF - Pb = below detectable limit
21						
24						
27			Core completed at 27 inches bgs.			
30						
33						
36						
39						
42						
45						
48						

LOG OF BORING 0.5, 2.5

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/21/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 40

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0–9		AR	FILL with slag	1	2	XRF - Pb = 660.8 +/- 83.3 ppm
9–18		SM	Brownish and tan silty SAND FILL			
18–39		SW	Tan fine grained SAND, wet	2	2	XRF - Pb = 8057.6 +/- 400.0 ppm
39				3	2	XRF - Pb = below detectable limit

Core completed at 40 inches bgs.

08-13-2002 K:\Calumet Container START\Boring Logs\0525.BOR

LOG OF BORING 0.5, 3.5

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/21/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 29

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			Top soil FILL	1	2	XRF - Pb = 5260.0 +/- 200.0 ppm
3		AR				
6			FILL with brick, sand, slag glass and metal bits, mixed with sand, solvent odor			
9						
12						
15				2	2	XRF - Pb = 1840.0 +/- 150.0 ppm
18		AR				
21						
24				3	2	XRF - Pb = 7974.4 +/- 490.0 ppm
27						
30			Core completed at 29 inches bgs.			
33						
36						
39						
42						
45						
48						

08-13-2002 K:\Calumet Container START\Boring Logs\0535.BOR

LOG OF BORING 0.5, 5

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/21/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 45
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0–6		AR	Top soil FILL	1	2	XRF - Pb = 8057.6 +/- 400.0 ppm
6–9		SW	Brown to tan fine SAND			
9–24		AR	Black FILL material with gravel, glass, metal and black sand			
24–36		AR	Reddish gravel FILL	2	2	XRF - Pb = 1429.6 +/- 170.0 ppm
				3	2	XRF - Pb = 601.6 +/- 92.9 ppm
36–45		SW	Light trey SAND, moist			
45–48			Core completed at 45 inches bgs.			

08-13-2002 K:\Calumet Container START\Boring Logs\0.55.BOR

LOG OF BORING 1,1

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 4/30/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 13

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			Light brown SAND			
3						
6		SW		1	12	XRF - Pb = 518.80 +/- 55.8 ppm
9						
12		SW	Stained black SAND			VOCs = 1494 ppm
			Core completed at 13 inches bgs.			
15						
18						
21						
24						
27						
30						
33						
36						
39						
42						
45						
48						

LOG OF BORING 1,2

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/21/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 38

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		SW	Top soil mixed with brown SAND	1	1	XRF - Pb = 793.2 +/- 91.9 ppm
3						
6						
9						
12						
15		AR	Blueish gray FILL with sand and stones	2	1	XRF - Pb = below detectable limit
18						
21						
24		AR	Blueish sand FILL mixed with paint residue			
27						
30		SW	Blackish finely grained SAND, moist	3	1	XRF - Pb = 4288.0 +/- 260.0 ppm
33						
36				4	1	XRF - Pb = below detectable limit
39			Core completed at 38 inches bgs.			
42						
45						
48						

08-13-2002 K:\Calumet Container START\Boring Logs\1.2.BOR

LOG OF BORING 1,3

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 4/30/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 39

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0						
3			FILL with light blue, green, yellow and red paint	1	1	XRF - Pb = 841.6 +/- 80.2 ppm
6		AR				
9						
12						VOCs = 304 ppm
15			FILL with brown sand			
18				2	2	XRF - Pb = 86.6 +/- 41.4 ppm
21						
24		AR				
27						
30						
33						
36		SW	Dark brown to black stained SAND			VOCs = 86 ppm
39			Core completed at 39 inches bgs.			
42						
45						
48						

08-15-2002 K:\Calumet Container START\Boring Logs\1.3.BOR

LOG OF BORING 1,4

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 4/30/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 40
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL			
3						
6						
9						
12		AR		1	1	XRF - Pb = 1868.8 +/- 94.7 ppm
15						
18						
21						
24						
27			Dark brown grading to tan fine SAND	2	1	XRF - Pb = below detectable limit
30						
33		SW				
36						
39						
			Core completed at 40 inches bgs.			
42						
45						
48						

LOG OF BORING 1,5

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 4/30/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 48

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL			
3						
6						
9						
12		AR		1	1	XRF - Pb = 1969.6 +/- 120.0
15						VOCs = 105 ppm
18						
21						
24			Black stained SAND			
27				2	1	XRF - Pb = below detectable limit
30		SW				
33			Dark gray fine SAND			
36						
39		SW				
42						
45						
48						

LOG OF BORING 1,7

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/1/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 39
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	FILL with blue material			
3						
6						
9						
12						
15				1	1	XRF - Pb = 121.9 +/- 68.6 ppm
18						
21						
24						
27		SW	Dark stained SAND with organic odor			
30						
33						
36				2	1	XRF - Pb = below detectable limit
39			Core completed at 39 inches bgs.			
42						
45						
48						

08-13-2002 K:\Calumet Container START\Boring Logs\1.7.BOR

LOG OF BORING 1,8

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/20/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 37

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			Silty sand FILL with some gravel, wet	1	1	XRF - Pb = 95.1 +/- 38.8 ppm
3		AR				
6			Gravel FILL, wet			
9		AR				
12			Silty SAND, wet			
15		SM				
18				2	1	XRF - Pb = 51.2 +/- 32.2 ppm
21			PEAT with some roots, wet			
24		PT				
27						
30			Gray fine SAND, wet			
33		SM				
36				3	1	XRF - Pb = below detectable limit
39			Core completed at 37 inches bgs.			
42						
45						
48						

08-13-2002 K:\Calumet Container START\Boring Logs\1.8.BOR

LOG OF BORING 1,9

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/20/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 28
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			Brownish black gravelly SAND with some soil, moist	1	1	XRF - Pb = 140.3 +/- 43.6 ppm
3		SW				
6			Whitish GRAVEL with stone, moist			
9						
12		GW				
15				2	1	XRF - Pb = 146.6 +/- 60.2 ppm
18			Gray SAND, moist			
21						
24		SW				
27				3	1	XRF - Pb = below detectable limit
			Core completed at 28 inches bgs.			
30						
33						
36						
39						
42						
45						
48						

LOG OF BORING 1,10

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/20/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 32

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Recovery (Inches)	REMARKS
0–6		AR	Brownish top soil FILL with some soil, moist	1	1	XRF - Pb = below detectable limit
6–27		AR	Gray and brown topsoil with gravel FILL	2	1	XRF - Pb = below detectable limit
27–33		PT	Black organic PEAT	3	1	XRF - Pb = below detectable limit
33–48			Core completed at 32 inches bgs.			

08-13-2002 K:\Calumet Container START\Boring Logs\1.10.BOR

LOG OF BORING 1.5, 3.5

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/21/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 45

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	FILL material with brick, white stone slag with silt	1	2	XRF - Pb = 1960.0 +/- 140.0 ppm
3						
6						
9						
12				2	2	XRF - Pb = 2689.6 +/- 210.0 ppm
15						
18		SM	Silty black SAND			
21						
24		SW	Tane fine grained SAND moist	3	2	XRF - Pb = below detectable limit
27						
30						
33						
36				4	9	XRF - Pb = below detectable limit
39						
42						
45			Core completed at 45 inches bgs.			
48						

08-13-2002 K:\Calumet Container START\Boring Logs\1.53.5.BOR

LOG OF BORING 1.5, 5.5

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/21/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 36

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			Top soil FILL with stones	1	1	XRF - Pb = 1840.0 +/- 140.0 ppm
3		AR				
6			Whitish gravel and stone FILL			
9		AR				
12						
15						
18				2	1	XRF - Pb = 291.8 +/- 78.8 ppm
21						
24		OL				
27						
30						
33						
36			Brick and slag FILL	3	1	XRF - Pb = below detectable limit
39			Core completed at 36 inches bgs.			
42						
45						
48						

LOG OF BORING 2,3

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 4/30/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 36
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			Slag FILL			
3						
6						
9						
12				1	1	XRF - Pb = 666.4 +/- 77.9 ppm VOCs = 47.9 ppm
15		AR				
18						
21						
24						
27				2	1	XRF - Pb = 1400.0 +/- 130.0 ppm
30						
33		SW	Dark brown native fine SAND			
36			Core completed at 36 inches bgs.			
39						
42						
45						
48						

08-15-2002 K:\Calumet Container START\Boring Logs\2,3.BOR

LOG OF BORING 2,4

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/1/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 34
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	Light brown silty clay lome soil FILL			
3				1	1	XRF - Pb = 1189.6 +/- 150.0 ppm
6		AR	Brown gravel FILL			
9						
12						
15						VOCs = 2.5 ppm
18		AR	Brown gravel FILL with dark staining			
21				2	2	XRF - Pb = 4649.6 +/- 290.0 ppm
24		AR	Black gravel FILL with larger particle size than above			
27						
30						
33						VOCs = 0 ppm
36			Core completed at 34 inches bgs.			
39						
42						
45						
48						

LOG OF BORING 2,5

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/1/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 37
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	FILL with pink, green and blue paint			
3						
6				1	1	XRF - Pb = 410.8 +/- 64.2 ppm
9						
12						
15						
18						VOCs = 0 ppm
21						
24						
27		CL	Black sandy CLAY	2	1	XRF - Pb = 177.9 +/- 69.5 ppm
30						
33						
36		SW	Gray fine SAND			
39			Core completed at 37 inches bgs.			
42						
45						
48						

08-15-2002 K:\Calumet Container START\Boring Logs\2.5.BOR

LOG OF BORING 2,6

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/1/02	Borehole Diameter (in.):	3
Drilling Method	: Geoprobe	Total Recovery (in.)	: 22
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL			
3						
6				1	1	XRF - Pb = 172.9 +/- 48.0 ppm
9		AR				
12						
15						VOCs = 0.2 ppm
18			Dark black fine SAND with trace clay			
21		SW		2	1	XRF - Pb = 42.0 +/- 27.5 ppm
24			Core completed at 22 inches bgs.			
27						
30						
33						
36						
39						
42						
45						
48						

LOG OF BORING 2,8

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/20/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 28

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	FILL with brown rocky topsoil, dry	1	1	XRF - Pb = 749.2 +/- 85.7 ppm
3						
		AR	FILL with brown sand and gravel			
6				2	1	XRF - Pb = 243.4 +/- 69.2 ppm
		PT	Black organic PEAT silty to gravelly			
9						
12						
15						
18						
21				3	1	XRF - Pb = below detectable limit
24						
		SW	Gray SAND			
27				4	1	XRF - Pb = 70.7 +/- 41.9 ppm
			Core completed at 30 inches bgs.			
30						
33						
36						
39						
42						
45						
48						

LOG OF BORING 2,9

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/1/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 33
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	FILL	1	1	XRF - Pb = 177.9 +/- 65.4 ppm
9		AR	FILL with white crushed rock			
12		AR	FILL			
33				2	1	XRF - Pb = below detectable limit

Core completed at 33 inches bgs.

Depth scale: 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48

08-13-2002 K:\Calumet Container START\Boring Logs\2,9.BOR

LOG OF BORING 2,10

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/21/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 39

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0–3		AR	FILL with topsoil			
3–9		AR	FILL with whitish stones	1	1	XRF - Pb = 80.2 +/- 45.6 ppm
9–18		SM	Brown sand and gravel FILL	2	1	XRF - Pb = 150.8 +/- 51.6 ppm
18–30		SW	Blackish silty SAND mixed with gravel, moist	3	1	XRF - Pb = 68.0 +/- 40.9 ppm
30–39		SW	Gray and black SAND mixed with gravel, wet			
39–48			Core completed at 39 inches bgs.			

LOG OF BORING 2,11

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/20/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 32

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL with brown topsoil mixed with gravel and sand, dry increasing moisture with depth	1	1	XRF - Pb = 82.9 +/- 41.6 ppm
3						
6						
9				2	1	XRF - Pb = below detectable limit
12						
15		AR				
18				3	1	XRF - Pb = below detectable limit
21						
24						
27						
30				4	1	XRF - Pb = below detectable limit
33			Core completed at 32 inches bgs.			
36						
39						
42						
45						
48						

LOG OF BORING 2.5, 4.5

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/21/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 40
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	FILL with slag	1	2	XRF - Pb = 972.0 +/- 98.4 ppm
3						
6						
9						
12		SM	Brownish and tan silty SAND FILL			
15						
18		SW	Tan fine grained SAND, wet	2	2	XRF - Pb = below detectable limit
21						
24						
27						
30						
33						
36						
39				3	2	XRF - Pb = below detectable limit
42			Core completed at 40 inches bgs.			
45						
48						

LOG OF BORING 3,3

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/1/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 37

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL			
3						
6				1	1	XRF - Pb = 1169.6 +/- 120.0 ppm
9		AR				
12						
15						
18						
21			Black very fine SAND			
24						
27		SW				
30						
33			Mottled SAND			
36		SW		2	1	XRF - Pb = below detectable limit
39			Core completed at 37 inches bgs.			
42						
45						
48						

LOG OF BORING 3,4

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/1/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 32
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0						
3		AR	FILL			
6			Tan native SAND (swampy area) grading to black and gray			
9				1	1	XRF - Pb = 58.0 +/- 38.5 ppm
12						
15						
18		SW				
21						
24						VOCs = 0 ppm
27						
30				2	1	XRF - Pb = below detectable limit
33			Core completed at 32 inches bgs.			
36						
39						
42						
45						
48						

LOG OF BORING 3,5

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/1/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 40

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL			
3						
6				1	1	XRF - Pb = 177.9 +/- 69.5 ppm
9						
12		AR				
15						
						VOCs = 330 ppm
18						
21						
24			FILL with brown clay			
27						
		AR				
30						VOCs = 64 ppm
				2	1	XRF - Pb = 678.8 +/- 68.8 ppm
33			Black fine SAND			
36		SW				
39						
			Core completed at 40 inches bgs.			
42						
45						
48						

LOG OF BORING 3,6

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/1/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 35
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL			
3						
6		AR		1	1	XRF - Pb = below detectable limit
9						
12			Light brown fine SAND with traces of clay and black staining between 20 and 23"			
15						
18						
21		SW				VOCs = 1.3 ppm
24						
27						
30						
33				2	1	XRF - Pb = below detectable limit
36			Core completed at 35 inches bgs.			
39						
42						
45						
48						

LOG OF BORING 3,7

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/1/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 44

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL with pink and light blue material throughout			
3						
6						
9						
12						
15				1	1	XRF - Pb = 157.8 +/- 90.5 ppm
18						
21		AR				VOCs = 0 ppm
24						
27						
30						
33						
36				2	1	XRF - Pb = below detectable limit
39						
42						
45			Core completed at 44 inches bgs.			
48						

08-15-2002 K:\Calumet Container START\Boring Logs\3.7.BOR

LOG OF BORING 3,8

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/1/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 32
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL			
3						
6						
9		AR		1	1	XRF - Pb = 752.0 +/- 74.4 ppm
12						
15						
18			Dark brown to black GRAVEL			
21						
24		GW				
27						
30				2	1	XRF - Pb = below detectable limit
		SW	Dark grey to black fine SAND			
33			Core completed at 32 inches bgs.			
36						
39						
42						
45						
48						

08-13-2002 K:\Calumet Container START\Boring Logs\3.8.BOR

LOG OF BORING 3,9

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/1/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 39

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL			
3						
6						
9		AR		1	2	XRF - Pb = 82.9 +/- 52.2 ppm
12						
15						
18						
21			Brown SAND			
24		SW				
27						
30			FILL			
33		AR				
36		SW	Dark stained fine SAND with some silt	2	1	XRF - Pb = below detectable limit
39			Core completed at 39 inches bgs.			
42						
45						
48						

08-13-2002 K:\Calumet Container START\Boring Logs\3.9.BOR

LOG OF BORING 3,10

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/21/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 39
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0–3		AR	Light brown topsoil FILL	1	1	XRF - Pb = 134.1 +/- 56.2 ppm
6–18		AR	Brick and sand FILL with stratified layers or red brick, orangish brick, grey sand	2	1	XRF - Pb = 103.4 +/- 42.8 ppm
21		SW	Grey to brown SAND			
24–27		AR	Grey gravel and stone FILL	3	1	XRF - Pb = 180.7 +/- 61.8 ppm
30		SW	Grey SAND			
33		GW	Grey stone and GRAVEL			
36–39		SW	Grey SAND	4	1	XRF - Pb = below detectable limit

Core completed at 39 inches bgs.

08-13-2002 K:\Calumet Container START\Boring Logs\3.10.BOR

LOG OF BORING 4,5

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 4/30/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 12

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			Dark brown SAND			
3		SW				
6			Tan SAND	1	1	XRF - Pb = 290.2 +/- 58.5 ppm
9						
		SW				
12			Core completed at 12 inches bgs.			
15						
18						
21						
24						
27						
30						
33						
36						
39						
42						
45						
48						

LOG OF BORING 4,7

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/1/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 32

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0			FILL			
3						
6						
9		AR				
12						
15				1	2	XRF - Pb = below detectable limit
18						
			Brown SAND with black stains at 20" grading to grey			VOCs = 0 ppm
21						
24		SW				
27						
30				2	1	XRF - Pb = below detectable limit
33			Core completed at 32 inches bgs.			
36						
39						
42						
45						
48						

LOG OF BORING 4,8

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/1/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 34

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	FILL with black stain water mark at 19"			
3						
6						
9						
12				1	1	XRF - Pb = 130.0 +/- 60.3 ppm
15						
18						
21						
24						
27						
30		SW	Grey fine SAND			
33				2	1	XRF - Pb = below detectable limit
			Core completed at 34 inches bgs.			
36						
39						
42						
45						
48						

LOG OF BORING 4,9

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 4/30/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 41

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	FILL with dark brown sandy gravel and some brick			
3						
6						
9						
12				1	1	XRF - Pb = 1469.6 +/- 120.0 ppm
15						
18		OL	Dark brown to grey silty CLAY			VOCs = 0 ppm
21						
24				2	1	XRF - Pb = 265.6 +/- 76.2 ppm
27						
30						
33		PT	PEAT with some roots and moist wetland soil			
36		SW	Grey SAND			
39						
42			Core completed at 41 inches bgs.			
45						
48						

08-15-2002 K:\Calumet Container START\Boring Logs\4.9.BOR

LOG OF BORING 5,6

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/20/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 32

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	Sandy FILL with some gravel and metal pieces	1	1	XRF - Pb = 78.2 +/- 32.2 ppm
3						
6						
9						
12		AR	Blackish organic FILL material with greyish sand grading to blackish sand and material	2	1	XRF - Pb = below detectable limit
15						
18						
21						
24						
27						
30				3	1	XRF - Pb = below detectable limit
33			Core completed at 32 inches bgs.			
36						
39						
42						
45						
48						

08-13-2002 K:\Calumet Container START\Boring Logs\5.6.BOR

LOG OF BORING 5,7

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/1/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 32
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	FILL with layer of red brick at 5" bgs.			
3						
6						
9						
12						
15				1	1	XRF - Pb = 180.7 +/- 61.8 ppm
18		SW	Dark brown fine SAND			
21						
24						
27						
30				2	1	XRF - Pb = below detectable limit
33			Core completed at 32 inches bgs.			
36						
39						
42						
45						
48						

LOG OF BORING 6,7

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/20/02	Borehole Diameter (in.): 3
Drilling Method	: Geoprobe	Total Recovery (in.) : 33
Drilled By	: EPA	
Logged By	: Don Paxton	
X, Y Coordinates	:	

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		AR	FILL with layer of red brick at 5" bgs.			
3				1	1	XRF - Pb = below detectable limit
6						
9				2	1	XRF - Pb = 1659.2 +/- 130.0 ppm
12						
15						
18		SW	Dark brown fine SAND			
21				3	1	XRF - Pb = 414.0 +/- 56.9 ppm
24						
27						
30						
33			Core completed at 33 inches bgs.			
36						
39						
42						
45						
48						

LOG OF BORING SD-1

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled	: 5/20/02	Borehole Diameter (in.): 3	
Drilling Method	: Geoprobe	Total Recovery (in.)	: 31
Drilled By	: EPA		
Logged By	: Don Paxton		
X, Y Coordinates	:		

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0–3		PT	Organic material with wood	1	1	XRF - Pb = below detectable limit
3–9		SW	Fine SAND			
9–15		PT	Black PEAT			
15–30		SW	Greyish SAND with streaks of black organic material	2	1	XRF - Pb = below detectable limit

Core completed at 31 inches bgs.

Depth scale: 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48

08-13-2002 K:\Calumet Container START\Boring Logs\SD-1.BOR

LOG OF BORING SD-2

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/20/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 28

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		PT	Black organic SOIL and material, loam, wet			XRF - Pb = below detectable limit
3						
6		SW	Greyish wet SAND with black organic material			
9				1	2	
12						
15						
18				2	2	XRF - Pb = 85.6 +/- 36.7 ppm
21						
24						
27						
30			Core completed at 28 inches bgs.			
33						
36						
39						
42						
45						
48						

LOG OF BORING SD-3

U.S. Environmental Protection Agency
Calumet Container
Hammond, Illinois

Date Drilled : 5/20/02
Drilling Method : Geoprobe
Drilled By : EPA
Logged By : Don Paxton
X, Y Coordinates :

Borehole Diameter (in.): 3
Total Recovery (in.) : 22

Depth in Inches	GRAPHIC	USCS	DESCRIPTION	Samples	Sample Interval (Inches)	REMARKS
0		PT	Dark organic SOIL and material with greyish wet sand increasing with depth	1	2	XRF - Pb = below detectable limit
3						
6						
9				2	2	XRF - Pb = below detectable limit
12						
15						
18				3	2	XRF - Pb = below detectable limit
21						
			Core completed at 22 inches bgs.			
24						
27						
30						
33						
36						
39						
42						
45						
48						

APPENDIX B

XRF DATA

Cuyuna Capital [illegible] XRF Data

Serial #XL700-U449NR2326 Site: Date: 4/11/2002 to 4/16/2002

No	Cor1	Date/Time	Mo ± Prec	Zr ± Prec	Sr ± Prec	Rb ± Prec	Pb ± Prec	As ± Prec	Hg ± Prec	Za ± Prec	Cu ± Prec	Ni ± Prec	Co ± Prec	Fe ± Prec	Mn ± Prec	Cr ± Prec
1	Shutter Cal 1	4/11/2002 24:52:27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2		4/11/2002 24:53:13	<LOD = 17.40	<LOD = 11.25	<LOD = 13.50	<LOD = 27.30	<LOD = 35.55	<LOD = 28.65	<LOD = 4.80	<LOD = 46.65	<LOD = 75.15	<LOD = 132.75	<LOD = 93.60	<LOD = 255.00	<LOD = 240.00	<LOD = 2848.80
3		4/11/2002 24:55:11	<LOD = 23.55	106.10 ± 17.60	174.10 ± 22.70	146.00 ± 41.10	<LOD = 62.55	<LOD = 46.65	<LOD = 5.40	84.50 ± 50.20	<LOD = 126.90	<LOD = 300.00	<LOD = 450.00	26393.60 ± 1300.00	<LOD = 1215.00	<LOD = 8246.40
4		4/11/2002 24:57:15	<LOD = 27.00	186.70 ± 23.00	176.80 ± 25.60	178.30 ± 50.50	1140.00 ± 110.00	<LOD = 131.85	<LOD = 14.25	323.60 ± 79.00	<LOD = 150.00	<LOD = 315.00	<LOD = 420.00	20198.40 ± 1200.00	1929.60 ± 829.60	<LOD = 8697.60
5		4/11/2002 24 59:18	<LOD = 30.30	91.00 ± 22.20	236.00 ± 34.90	210.60 ± 72.10	5507.20 ± 290.00	535.20 ± 200.00	<LOD = 34.20	6880.00 ± 390.00	2899.20 ± 380.00	<LOD = 555.00	<LOD = 600.00	32691.20 ± 1800.00	10195.20 ± 1400.00	<LOD = 16492.80
6	Shutter Cal 1	4/14/2002 21:03:09	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Shutter Cal 1	4/14/2002 21:08:41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Shutter Cal 1	4/14/2002 23:29:31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9		4/14/2002 23:30:04	<LOD = 10.20	100.60 ± 7.50	79.10 ± 7.80	72.20 ± 14.60	150.60 ± 21.40	<LOD = 25.50	<LOD = 3.45	692.40 ± 42.40	82.90 ± 46.10	<LOD = 101.70	169.40 ± 87.10	8825.60 ± 310.00	783.20 ± 250.00	<LOD = 2700.00
10		4/14/2002 23:35:57	<LOD = 10.65	119.40 ± 8.10	85.10 ± 8.20	67.90 ± 14.90	173.50 ± 22.60	<LOD = 26.70	<LOD = 3.60	500.80 ± 37.50	<LOD = 64.50	<LOD = 105.75	201.40 ± 90.50	9126.40 ± 330.00	681.60 ± 250.00	<LOD = 2700.00
11		4/14/2002 23:41:53	14.90 ± 8.90	134.40 ± 9.80	72.70 ± 9.20	67.30 ± 17.00	49.70 ± 21.20	<LOD = 26.40	<LOD = 4.05	376.80 ± 39.80	<LOD = 74.10	<LOD = 119.85	<LOD = 144.90	7776.00 ± 350.00	534.00 ± 270.00	<LOD = 3000.00
12		4/14/2002 23:46:39	<LOD = 12.75	107.90 ± 9.30	97.00 ± 10.10	69.10 ± 17.90	108.50 ± 24.50	<LOD = 29.55	<LOD = 4.35	533.60 ± 46.30	<LOD = 82.95	<LOD = 137.25	<LOD = 165.00	10899.20 ± 420.00	800.80 ± 330.00	12000.00 ± 2800.00
13		4/14/2002 23:53:46	<LOD = 10.50	132.70 ± 8.30	61.00 ± 7.40	59.00 ± 13.80	77.30 ± 18.50	<LOD = 22.65	<LOD = 3.45	517.60 ± 37.90	<LOD = 65.10	<LOD = 100.65	173.20 ± 82.00	7238.40 ± 290.00	600.80 ± 230.00	<LOD = 2700.00
14		4/14/2002 23:59:07	14.60 ± 9.70	109.10 ± 10.20	105.60 ± 11.30	82.60 ± 20.50	154.50 ± 29.30	<LOD = 34.65	<LOD = 4.95	567.60 ± 52.30	100.50 ± 65.80	260.20 ± 120.00	<LOD = 210.00	14899.20 ± 540.00	1180.00 ± 410.00	8364.80 ± 3200.00
15		4/14/2002 24:08:09	<LOD = 10.65	64.50 ± 6.90	41.10 ± 7.20	66.00 ± 14.80	135.80 ± 22.20	<LOD = 26.55	<LOD = 3.75	848.80 ± 50.00	<LOD = 78.15	<LOD = 108.15	<LOD = 134.25	8416.00 ± 330.00	531.20 ± 250.00	<LOD = 2848.80
16		4/14/2002 24:13:28	<LOD = 10.20	90.90 ± 7.40	55.80 ± 7.30	65.50 ± 14.30	64.30 ± 18.50	<LOD = 21.45	<LOD = 3.30	382.40 ± 34.30	75.00 ± 41.10	<LOD = 95.85	125.90 ± 81.30	7046.40 ± 290.00	624.00 ± 230.00	<LOD = 2548.80
17		4/14/2002 24:18:58	<LOD = 11.10	101.50 ± 8.10	74.40 ± 8.40	76.70 ± 16.10	220.20 ± 25.90	<LOD = 32.10	<LOD = 4.35	1040.00 ± 55.20	97.40 ± 57.70	<LOD = 126.90	<LOD = 165.00	13094.40 ± 420.00	1129.60 ± 310.00	<LOD = 3300.00
18		4/14/2002 24:24:02	<LOD = 10.20	85.10 ± 7.40	58.50 ± 7.70	61.40 ± 14.80	230.60 ± 25.30	<LOD = 30.45	<LOD = 4.20	842.40 ± 49.20	110.80 ± 53.80	<LOD = 123.90	197.20 ± 110.00	13299.20 ± 410.00	861.60 ± 310.00	5459.20 ± 2400.00
19		4/14/2002 24:42:14	<LOD = 10.35	93.70 ± 7.20	37.20 ± 6.50	56.30 ± 13.10	44.10 ± 16.70	<LOD = 19.95	<LOD = 3.00	177.00 ± 25.40	<LOD = 50.55	<LOD = 93.60	<LOD = 117.30	7014.40 ± 280.00	743.20 ± 230.00	<LOD = 2400.00
20		4/14/2002 24:47:16	<LOD = 12.60	48.90 ± 8.10	95.80 ± 11.00	67.70 ± 20.50	799.20 ± 49.60	<LOD = 59.10	<LOD = 7.05	800.40 ± 58.50	<LOD = 98.70	<LOD = 165.00	<LOD = 225.00	18393.60 ± 600.00	1529.60 ± 430.00	<LOD = 4500.00
21		4/15/2002 01:10:10	<LOD = 10.20	83.30 ± 7.30	83.60 ± 8.20	73.90 ± 15.30	160.50 ± 22.50	<LOD = 27.15	<LOD = 3.75	489.60 ± 37.80	<LOD = 66.00	<LOD = 107.10	<LOD = 137.55	9619.20 ± 340.00	819.20 ± 260.00	<LOD = 2848.80
22		4/15/2002 01:16:42	<LOD = 10.65	111.40 ± 8.10	89.70 ± 8.50	81.20 ± 15.70	76.90 ± 19.70	<LOD = 23.25	<LOD = 3.30	213.80 ± 28.50	<LOD = 58.50	<LOD = 108.00	214.40 ± 91.10	8704.00 ± 330.00	828.80 ± 250.00	<LOD = 2700.00
23		4/15/2002 01:21:41	<LOD = 12.90	197.30 ± 10.90	92.50 ± 9.40	63.80 ± 16.70	154.50 ± 24.80	<LOD = 29.10	<LOD = 4.05	276.40 ± 34.80	104.00 ± 48.90	<LOD = 144.15	409.00 ± 140.00	19993.60 ± 570.00	4147.20 ± 450.00	<LOD = 4500.00
24		4/15/2002 01:30:19	<LOD = 11.85	116.80 ± 8.80	75.30 ± 8.70	93.70 ± 17.30	100.70 ± 22.50	<LOD = 26.55	<LOD = 3.60	231.80 ± 32.00	93.60 ± 44.50	<LOD = 117.60	<LOD = 150.00	9996.80 ± 370.00	535.20 ± 280.00	<LOD = 3000.00
25		4/15/2002 01:36:18	<LOD = 11.55	90.00 ± 8.20	74.50 ± 8.80	80.00 ± 17.30	287.80 ± 29.60	<LOD = 36.30	<LOD = 4.80	453.60 ± 40.80	<LOD = 76.65	<LOD = 142.80	364.20 ± 140.00	18188.80 ± 530.00	1720.00 ± 390.00	<LOD = 4048.80
26		4/15/2002 01:51:53	<LOD = 12.15	141.90 ± 9.30	57.50 ± 8.10	73.60 ± 16.30	204.80 ± 26.00	<LOD = 31.35	<LOD = 4.05	225.40 ± 31.40	<LOD = 64.35	<LOD = 119.85	190.40 ± 110.00	11494.40 ± 400.00	1939.20 ± 330.00	<LOD = 3448.80
27		4/15/2002 01:57:00	<LOD = 12.45	135.10 ± 9.50	65.30 ± 8.70	75.40 ± 17.00	164.60 ± 25.50	<LOD = 30.90	<LOD = 4.20	234.60 ± 33.30	84.90 ± 46.50	<LOD = 130.50	224.40 ± 120.00	13094.40 ± 450.00	1300.00 ± 340.00	<LOD = 3600.00
28		4/15/2002 02:01:14	<LOD = 14.40	125.30 ± 10.90	39.70 ± 9.10	76.20 ± 19.40	63.20 ± 24.60	<LOD = 28.65	<LOD = 4.05	112.70 ± 31.30	<LOD = 69.30	<LOD = 132.00	242.20 ± 120.00	8198.40 ± 420.00	1089.60 ± 340.00	<LOD = 3748.80
29		4/15/2002 02:08:14	<LOD = 13.95	98.80 ± 9.90	50.90 ± 9.70	81.20 ± 20.30	336.20 ± 37.10	<LOD = 44.10	<LOD = 5.70	239.00 ± 38.90	112.10 ± 51.50	<LOD = 126.45	184.50 ± 120.00	8409.60 ± 420.00	3019.20 ± 400.00	<LOD = 4200.00
30		4/15/2002 02:11:44	<LOD = 10.20	91.20 ± 7.40	82.20 ± 8.20	55.60 ± 14.70	409.60 ± 29.80	<LOD = 36.75	<LOD = 4.35	622.40 ± 41.50	<LOD = 70.65	<LOD = 115.50	270.00 ± 100.00	11596.80 ± 370.00	<LOD = 405.00	<LOD = 3000.00
31		4/15/2002 02:20:27	<LOD = 15.45	97.30 ± 11.10	63.40 ± 11.20	87.90 ± 22.90	87.70 ± 29.50	<LOD = 35.40	<LOD = 5.10	152.90 ± 37.80	<LOD = 81.30	<LOD = 165.00	<LOD = 210.00	11296.00 ± 540.00	1140.00 ± 420.00	<LOD = 4648.80
32		4/15/2002 02:24:44	<LOD = 12.60	9.20 ± 6.10	19.80 ± 7.80	23.40 ± 14.80	106.20 ± 25.10	<LOD = 31.95	<LOD = 4.80	404.60 ± 48.30	267.20 ± 63.60	<LOD = 138.60	236.40 ± 130.00	9958.40 ± 470.00	2219.20 ± 400.00	<LOD = 4048.80
33		4/15/2002 02:27:19	<LOD = 35.85	<LOD = 15.30	<LOD = 22.95	<LOD = 32.85	<LOD = 82.50	<LOD = 63.75	<LOD = 6.45	<LOD = 137.40	<LOD = 195.00	<LOD = 330.00	<LOD = 435.00	4988.80 ± 1100.00	<LOD = 1290.00	<LOD = 10195.20
34	Shutter Cal 1	4/15/2002 03:52:45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
35		4/15/2002 04:02:26	<LOD = 14.25	58.30 ± 9.40	51.90 ± 10.60	99.80 ± 23.30	177.90 ± 34.20	<LOD = 41.55	<LOD = 5.25	250.20 ± 43.40	<LOD = 87.15	<LOD = 165.00	<LOD = 225.00	13094.40 ± 580.00	<LOD = 630.00	<LOD = 4500.00
36		4/15/2002 04:05:35	<LOD = 12.15	76.40 ± 8.20	68.20 ± 9.60	101.40 ± 20.70	1109.60 ± 53.90	<LOD = 64.20	<LOD = 7.20	1040.00 ± 61.30	<LOD = 102.15	<LOD = 180.00	467.60 ± 180.00	32896.00 ± 800.00	1788.80 ± 510.00	<LOD = 5097.60
37		4/15/2002 04:14:56	14.50 ± 7.60	43.60 ± 6.80	66.80 ± 8.70	65.40 ± 17.10	586.80 ± 38.60	<LOD = 47.85	<LOD = 5.70	437.60 ± 41.30	96.50 ± 55.80	<LOD = 180.00	532.40 ± 190.00	38297.60 ± 849.60	952.00 ± 510.00	<LOD = 4948.80
38		4/15/2002 04:27:06	<LOD = 16.20	65.50 ± 10.20	37.10 ± 10.60	70.60 ± 22.70	279.00 ± 40.70	<LOD = 47.85	<LOD = 6.30	329.20 ± 51.40	<LOD = 102.30	<LOD = 195.00	270.80 ± 170.00	13388.80 ± 620.00	1129.60 ± 470.00	<LOD = 5400.00
39		4/15/2002 04:30:40	<LOD = 16.20	88.30 ± 11.20	49.80 ± 11.20	107.70 ± 25.20	242.40 ± 39.50	<LOD = 47.10	<LOD = 6.15	222.60 ± 46.40	<LOD = 105.60	379.80 ± 140.00	288.60 ± 180.00	16089.60 ± 680.00	773.60 ± 480.00	<LOD = 5246.40
40		4/15/2002 04:37:32	<LOD = 20.55	57.80 ± 12.20	49.80 ± 13.70	103.30 ± 30.50	305.80 ± 51.80	<LOD = 61.50	<LOD = 7.50	381.40 ± 65.20	<LOD = 127.20	<LOD = 240.00	<LOD = 330.00	17600.00 ± 880.00	<LOD = 900.00	<LOD = 6297.60
41		4/15/2002 04:41:00	<LOD = 19.05	186.90 ± 15.80	50.00 ± 12.20	92.20 ± 26.00	127.00 ± 36.10	<LOD = 43.05	<LOD = 5.85	206.20 ± 48.60	<LOD = 108.60	<LOD = 210.00	<LOD = 270.00	14489.60 ± 700.00	814.00 ± 510.00	<LOD = 5548.80
42	Shutter Cal 1	4/15/2002 04:54:18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
43		4/15/2002 04:54:26	<LOD = 15.60	92.70 ± 11.20	60.70 ± 11.50	122.10 ± 25.80	241.60 ± 39.10	<LOD = 46.95	<LOD = 6.00	538.00 ± 59.30	<LOD = 107.85	<LOD = 195.00	385.00 ± 190.00	19494.40 ± 750.00	1249.60 ± 530.00	<LOD = 5400.00
44		4/15/2002 04:58:01	21.10 ± 13.00	86.90 ± 12.70	89.80 ± 14.70	97.10 ± 29.40	584.40 ± 59.90	<LOD = 73.65	<LOD = 8.85	740.80 ± 78.20	<LOD = 144.60	<LOD = 285.00	620.80 ± 280.00	34099.20 ± 1200.00	1929.60 ± 760.00	<LOD = 7646.40
45		4/15/2002 05:26:13	<LOD = 17.85	128.40 ± 13.20	80.90 ± 12.90	84.40 ± 24.90	175.40 ± 36.80	<LOD = 44.25	<LOD = 5.70	323.40 ± 50.90	<LOD = 96.15	<LOD = 180.00	<LOD = 240.00	11596.80 ± 580.00	651.60 ± 430.00	<LOD = 4500.00
46		4/15/2002 05:29:15	<LOD = 17.85	174.80 ± 14.60	99.60 ± 13.50	73.30 ± 24.10	195.60 ± 36.90	<LOD = 43.05	<LOD = 5.25	212.80 ± 43.50	<LOD = 88.95	<LOD = 180.00	303.00 ± 150.00	10598.40 ± 550.00	624.00 ± 410.00	<LOD = 4500.00
47		4/15/2002 05:35:09	<LOD = 17.40	133.40 ± 13.50	110.40 ± 14.20	105.40 ± 27.00	227.80 ± 40.20	<LOD = 49.05	<LOD = 6.30	266.40 ± 48.70	<LOD = 99.75	<LOD = 180.00	255.20 ± 160.00	12000.00 ± 600.00	1160.00 ± 450.00	<LOD = 4800.00
48		4/15/2002 05:38:34	<LOD = 16.50	199.00 ± 14.30	97.40 ± 12.50	112.00 ± 24.50	42.10 ± 27.20	<LOD = 30.75	<LOD = 4.35	84.60 ± 32.40	<LOD = 75.30	<LOD = 148.80	<LOD = 210.00	10598.40 ± 520.00	2400.00 ± 440.00	<LOD = 4500.00
49		4/15/2002 05:47:14	<LOD = 19.05	173.40 ± 15.80	110.70 ± 15.30	97.30 ± 28.50	258.60 ± 44.50	<LOD = 54.15	<LOD = 7.05	228.80 ± 50.80	115.90 ± 73.10	<LOD = 195.00	<LOD = 255.00	12595.20 ± 650.00	<LOD = 705.00	<LOD = 5097.60
50		4/15/2002 05:50:14	<LOD = 17.55	170.00 ± 14.20	106.70 ± 13.50	101.00 ± 25.50	159.20 ± 35.00	<LOD = 40.50	<LOD = 5.25	162.10 ± 40.00	<LOD = 85.95	<LOD = 150.00	<LOD = 210.00	8697.60 ± 490.00	1708.80 ± 410.00	<LOD = 4500.00
51		4/15/2002 05:55:50	<LOD = 16.80	64.10 ± 11.00	99.10 ± 13.90	82.40 ± 25.60	157.60 ± 36.80	<LOD = 45.45	<LOD = 6.15	284.80 ± 50.20	<LOD = 100.50	<LOD = 180.00	<LOD = 270.00	15193.60 ± 690.00	976.80 ± 500.00	<LOD = 5097.60
52		4/15/2002 05:59:26	<LOD = 11.40	75.60 ± 7.70	53.30 ± 8.20	80.20 ± 17.20	414.80 ± 33.60	<LOD = 40.95	<LOD = 4.80	485.60 ± 41.60	<LOD = 75.75	<LOD = 150.00	470.00 ± 150.00	23692.80 ± 620.00	1469.60 ± 420.00	<LOD = 4200.00
53		4/15/2002 06:05:18	<LOD = 78.30	<LOD = 39.75	<LOD = 46.65	<LOD = 133.95	<LOD = 195.00	<LOD = 125.85	<LOD = 16.80	<LOD = 150.00	<LOD = 180.00	<LOD = 450.00	<LOD = 330.00	<LOD = 1050.00	<LOD = 750.00	<LOD = 3600.00
54		4/15/2002 06:08:50	<LOD = 17.25	171.80 ± 14.20	114.60 ± 13.70	93.30 ± 24.90	152.30 ± 34.20	<LOD = 39.90	<LOD = 5.10	148.90 ± 38.80	<LOD = 84.60	<LOD = 165.00	<LOD = 210.00	9235.20 ± 490.00	<LOD = 555.00	<LOD = 4048.80
55		4/15/2002 06:11:53	<LOD = 12.90	179.90 ± 10.70	129.50 ± 10.70	98.20 ± 19.40	346.00 ± 32.40	<LOD = 39.15	<LOD = 4.95	338.80 ± 37.30	82.30 ± 48.20	<LOD = 127.05	271.60 ± 120.00	12595.20 ± 440.00	2440.00 ± 360.00	<LOD = 3748.80
56		4/15/2002 06:25:47	<LOD = 15.45	132.40 ± 12.10	91.60 ± 12.00	108.70 ± 23.80	92.40 ± 29.20	<LOD = 34.50	<LOD = 4.50	143.90 ± 35.90	<LOD = 78.15	<LOD = 142.80	<LOD = 195.00	8537.60 ± 460.00	2259.20 ± 400.00	<LOD = 4348.80
57		4/15/2002 06:29:20	<LOD = 14.40	133.60 ± 11.30	58.50 ± 9.90	66.90 ± 19.10	<LOD = 33.15	<LOD = 26.55	<LOD = 3.75	93.50 ± 30.40	<LOD = 69.75	<LOD = 133.20	170.80 ± 110.00	7526.40 ± 400.00	<LOD = 450.00	<LOD = 3300.00
58		4/15/2002 06:39:24	<LOD = 16.05	89.70 ± 11.00	46.40 ± 10.70	90.30 ± 23.20	157.20 ± 33.90	<LOD = 39.45	<LOD = 5.10	240.20 ± 44.50	94.00 ± 61.00	<LOD = 165.00	<LOD = 225.00	11897.60 ± 570.00	1060.00 ± 430.00	<LOD = 4348.80
59		4/15/2002 06:42:53	<LOD = 13.35	26.10 ± 7.60	38.30 ± 9.50	42.70 ± 18.40	261.60 ± 35.60	<LOD = 44.85	<LOD = 6.00	318.80 ± 46.20	160.50 ± 60.10	<LOD = 143.25	<LOD = 195.00	9958.40 ± 500.00	4377.60 ± 480.00	<LOD = 4800.00
60		4/15/2002 06:50:57	<LOD = 15.00	140.80 ± 11.50	60.00 ± 10.00	76.60 ± 19.90	54.90 ± 24.50	<LOD = 28.65	<LOD = 3.90	145.20 ± 33.60	<LOD = 72.15	<LOD = 139.80	<LOD = 180.00	9638.40 ± 450.00	709.20 ± 350.00	<LOD = 3900.00
61		4/15/2002 06:54:35	11.00 ± 7.10	47.30 ± 6.40	40.90 ± 7.30	64.80 ± 15.40	384.60 ± 30.90	<LOD = 37.80	<LOD = 4.80	568.80 ± 42.40	<LOD = 73.35	<LOD = 130.35	234.60 ± 120.00	16396.80 ± 480.00	746.00 ± 330.00	<LOD = 3448.80
62		4/15/2002 07:09:45	<LOD = 21.15	163.50 ± 16.10	77.20 ± 14.40	157.60 ± 32.60	<LOD = 52.65	<LOD = 42.60	<LOD = 6.00	126.80 ± 44.90	<LOD = 102.75	<LOD = 195.00	<LOD = 255.00	11897.60 ± 660.00	<LOD = 720.00	<LOD = 5400.00
63		4/15/2002 07:12:53	<LOD = 12.00	201.40 ± 10.30	62.70 ± 8.40	77.70 ± 17.40	987.20 ± 45.70	<LOD = 55.20	<LOD = 6.15	1020.00 ± 62.20	1509.60 ± 92.60	<LOD = 150.00	218.80 ± 110.00	12396.80 ± 400.00	659.60 ± 290.00	<LOD = 3148.80
64		4/15/2002 07:38:32	<LOD = 13.20	155.70 ± 10.70	90.50 ± 10.30	101.90 ± 20.70	640.80 ± 43.20	<LOD = 50.25	<LOD = 5.55	357.80 ± 40.30	<LOD = 77.10	<LOD = 150.00	357.40 ± 140.00	16089.60 ± 530.00	1209.60 ± 380.00	<LOD = 4048.80
65		4/15/2002 07:43:32	<LOD = 12.00	60.80 ± 7.60	55.20 ± 8.70	64.00 ± 17.60	620.00 ± 40.80	<LOD = 49.20	<LOD = 6.00	554.40 ± 51.40	<LOD = 118.65	2828.80 ± 170.00	254.00 ± 140.00	16294.40 ± 520.00	1069.60 ± 380.00	5878.40 ± 2899.20
66		4/15/2002 07:57:09	<LOD = 17.55	138.90 ± 13.40	84.80 ± 13.00	164.70 ± 29.40	66.50 ± 32.60	<LOD = 37.20	<LOD = 5.25	142.70 ± 39.90	<LOD = 90.30	<LOD = 195.00	<LOD = 270.00	17190.40 ± 720.00	1220.00 ± 520.00	<LOD = 5400.00
67		4/15/2002 07:59:12	<LOD = 2848.80	<LOD = 1950.00	<LOD = 1800.00	<LOD = 2848.80	<LOD = 8548.80	<LOD = 9000.00	<LOD = 4500.00	<LOD = 34483.20	<LOD = 86937.60	<LOD = 1319731.225	<LOD = 58483.20	<LOD = 314880.00	<LOD = 92928.00	<LOD = 884736.00
68		4/15/2002 08:00:55	<LOD = 13.20	22.00 ± 7.40	60.40 ± 10.20	46.20 ± 18.50	222.00 ± 32.80	<LOD = 39.60	<LOD = 4.95	277.00 ± 41.50	<LOD = 78.90	<LOD = 145.65	290.80 ± 130.00	9875.20 ± 470.00	<LOD = 525.00	<LOD = 3900.00
69	Shutter Cal 1	4/15/2002 21:25:20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
70		4/15/2002 22:13:17	<LOD = 16.80	108.60 ± 12.50	80.30 ± 12.90	113.50 ± 26.60	89.40 ± 32.70	<LOD = 38.85	<LOD = 5.10	315.20 ± 50.50	<LOD = 97.95	<LOD = 180.00	346.00 ± 170.00	12396.80 ± 610.00	1020.00 ± 460.00	<LOD = 4800.00
71		4/15/2002 22:16:37	<LOD = 15.45	140.30 ± 11.90	69.20 ± 10.80	90.00 ± 21.50	<LOD = 35.55	<LOD = 28.20	<LOD = 4.65	117.50 ± 35.30	<LOD = 87.00	518.80 ± 120.00	181.40 ± 120.00	7584.00 ± 420.00	689.20 ± 330.00	<LOD = 3748.80
72		4/15/2002 22:18:56	<LOD = 15.45	140.30 ± 11.90	69.20 ± 10.80	90.00 ± 21.50	<LOD = 35.55	<LOD = 28.20	<LOD = 4.65	117.50 ± 35.30	<LOD = 87.00	518.80 ± 120.00	181.40 ± 120.00	7584.00 ± 420.00	689.20 ± 330.00	<LOD = 3748.80
73		4/15/2002 22:21:09	<LOD = 15.45	140.30 ± 11.90	69.20 ± 10.80	90.00 ± 21.50	<LOD = 35.55	<LOD = 28.20	<LOD = 4.65	117.50 ± 35.30	<LOD = 87.00	518.80 ± 120.00	181.40 ± 120.00	7584.00 ± 420.00	689.20 ± 330.00	<LOD = 3748.80
74		4/15/2002 22:21:12	<LOD = 16.65	121.40 ± 12.20	101.00 ± 12.90	88.50 ± 23.70	51.80 ± 27.80	<LOD = 32.25	<LOD = 4.80	165.10 ± 38.70	<LOD = 82.35	<LOD = 150.00	<LOD = 210.00	10400.00 ± 520.00	586.80 ± 390.00	<LOD = 4200.00
75		4/15/2002 22:24:40	<LOD = 16.20	144.00 ± 12.80	75.30 ± 11.70	57.50 ± 20.90	91.70 ± 28.70	<LOD = 32.55	<LOD = 4.50	148.60 ± 38.30	<LOD = 86.85	341.80 ± 120.00	<LOD = 195.00	9657.60 ± 500.00	1029.60 ± 390.00	<LOD = 4500.00
76		4/15/2002 22:39:10	<LOD = 19.20	62.20 ± 13.30	102.10 ± 17.10	68.00 ± 30.80	357.40 ± 56.30	<LOD = 67.95	<LOD = 8.70	492.80 ± 73.90	<LOD = 134.40	<LOD = 240.00	<LOD = 345.00	17996.80 ± 920.00	1939.20 ± 670.00	<LOD = 7200.00
77		4/15/2002 22:42:10	<LOD = 20.25	87.20 ± 14.50	131.90 ± 18.10	69.40 ± 30.40	146.80 ± 43.30	<LOD = 51.15	<LOD = 6.75	418.80 ± 70.00	<LOD = 139.95	<LOD = 240.00	<LOD = 330.00	17088.00 ± 880.00	1369.60 ± 630.00	<LOD = 6600.00
78		4/15/2002 22:44:32	<LOD = 20.25	87.20 ± 14.50	131.90 ± 18.10	69.40 ± 30.40	146.80 ± 43.30	<LOD = 51.15	<LOD = 6.75	418.80 ± 70.00	<LOD = 139.95	<LOD = 240.00	<LOD = 330.00	17088.00 ± 880.00	1369.60 ± 630.00	<LOD = 6600.00
79		4/15/2002 22:49:45	<LOD = 19.50	61.10 ± 11.70	62.30 ± 14.10	<LOD = 38.25	1460.00 ± 88.70	<LOD = 106.35	<LOD = 12.90	1620.00 ± 110.00	426.40 ± 150.00	<LOD = 525.00	<LOD = 885.00	187904.00 ± 4697.60	13696.00 ± 1699.20	<LOD = 16492.80
80		4/15/2002 22:55:16	<LOD = 26.10	39.60 ± 15.30	55.50 ± 18.90	<LOD = 50.85	479.20 ± 78.80	<LOD = 99.60	<LOD = 13.20	1020.00 ± 130.00	<LOD = 240.00	<LOD = 405.00	<LOD = 615.00	39091.20 ± 1899.20	3667.20 ± 1200.00	<LOD = 12297.60
81		4/15/2002 22:59:40	<LOD = 17.70	78.00 ± 11.70	51.80 ± 12.10	57.50 ± 23.60	196.80 ± 39.20	<LOD = 47.55	<LOD = 6.00	207.00 ± 48.00	<LOD = 106.95	<LOD = 225.00	<LOD = 330.00	23296.00 ± 929.60	1760.00 ± 640.00	<LOD = 6446.40
82		4/15/2002 23:32:13	<LOD = 14.70	110.00 ± 10.90	35.80 ± 9.30	77.70 ± 20.10	<LOD = 33.15	<LOD = 26.25	<LOD = 3.90	44.40 ± 27.90	<LOD = 69.30	<LOD = 137.55	<LOD = 180.00	7366.40 ± 410.00	639.60 ± 330.00	<LOD = 3748.80
83		4/15/2002 23:35:50	<LOD = 15.15	85.80 ± 10.50	42.50 ± 10.10	73.70 ± 21.20	[illegible] ± 29.30	<LOD = 35.85	<LOD = 4.65	157.40 ± 38.00	<LOD = 82.20	<LOD = 150.00	<LOD = 210.00	9977.60 ± 510.00	853.60 ± 390.00	<LOD = 4200.00
84	Shutter Cal 1	4/15/2002 09:54:16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
85		4/15/2002 09:57:39	<LOD = 10.20	85.20 ± 7.30	36.40 ± 7.20	58.20 ± 15.40	[illegible] ± 41.20	<LOD = 48.75	<LOD = 5.40	480.40 ± 38.40	<LOD = 65.70	<LOD = 104.70	162.60 ± 86.90	8025.60 ± 310.00	444.80 ± 240.00	<LOD = 2700.00
86		4/15/2002 10:02:31	<LOD = 14.40	70.00 ± 9.80	53.20 ± 10.40	50.20 ± 19.5[illegible]	[illegible] ± 26.40	<LOD = 31.50	<LOD = 4.50	142.70 ± 35.40	<LOD = 73.50	<LOD = 133.50	<LOD = 165.00	6467.20 ± 400.00	478.00 ± 310.00	<LOD = 3600.00
87		4/15/2002 10:05:33

No	Cor1	Date/Time	Mo ± Prec	Zr ± Prec	Sr ± Prec	Rb ± Prec	Pb ± Prec	As ± Prec	Hg ± Prec	Zn ± Prec	Cu ± Prec	Ni ± Prec	Co ± Prec	Fe ± Prec	Mn ± Prec	Cr ± Prec
90		4/15/2002 10:14:00	<LOD = 18.00	87.30 ± 12.10	50.40 ± 12.10	120.70 ± 27.80	<LOD = 48.15	<LOD = 39.00	<LOD = 5.55	193.80 ± 46.10	<LOD = 99.15	<LOD = 210.00	345.40 ± 190.00	15296.00 ± 730.00	843.20 ± 520.00	<LOD = 5400.00
91		4/15/2002 10:24:36	<LOD = 16.05	152.10 ± 12.90	57.80 ± 10.80	80.80 ± 21.80	<LOD = 38.10	<LOD = 29.70	<LOD = 4.35	84.70 ± 31.60	<LOD = 69.90	<LOD = 139.20	<LOD = 180.00	6944.00 ± 420.00	509.60 ± 330.00	<LOD = 3600.00
92		4/15/2002 10:26:46	<LOD = 270.00	<LOD = 150.00	<LOD = 165.00	<LOD = 630.00	<LOD = 450.00	<LOD = 600.00	<LOD = 47.40	<LOD = 2100.00	<LOD = 5246.40	30284.80 ± 9996.80	<LOD = 4500.00	<LOD = 9897.60	<LOD = 6748.80	<LOD = 89932.80
93		4/15/2002 10:28:32	<LOD = 17.70	149.10 ± 13.90	84.70 ± 13.00	77.50 ± 24.20	58.80 ± 29.90	<LOD = 36.15	<LOD = 5.40	135.20 ± 39.10	<LOD = 84.30	<LOD = 165.00	<LOD = 210.00	8659.20 ± 500.00	<LOD = 570.00	<LOD = 4200.00
94		4/15/2002 10:31:08	<LOD = 16.05	145.70 ± 12.80	88.50 ± 12.30	77.00 ± 22.60	137.70 ± 31.80	<LOD = 37.50	<LOD = 4.95	229.20 ± 42.30	<LOD = 86.10	<LOD = 165.00	<LOD = 195.00	9606.40 ± 490.00	558.40 ± 370.00	<LOD = 4048.80
95		4/15/2002 11:04:51	<LOD = 15.30	84.70 ± 10.80	45.80 ± 10.60	97.20 ± 23.50	111.90 ± 31.50	<LOD = 38.70	<LOD = 4.80	192.30 ± 41.10	<LOD = 86.10	<LOD = 180.00	<LOD = 240.00	13094.40 ± 600.00	<LOD = 645.00	<LOD = 4648.80
96		4/15/2002 11:09:07	<LOD = 21.60	78.40 ± 14.60	81.50 ± 16.70	89.60 ± 32.80	187.20 ± 49.20	<LOD = 58.20	<LOD = 8.10	481.20 ± 77.00	<LOD = 146.10	<LOD = 255.00	<LOD = 360.00	18688.00 ± 980.00	<LOD = 1005.00	<LOD = 7046.40
97		4/15/2002 11:17:39	<LOD = 15.00	130.10 ± 11.60	52.20 ± 10.20	88.90 ± 21.40	<LOD = 37.05	<LOD = 29.40	<LOD = 4.65	162.50 ± 36.00	<LOD = 75.75	<LOD = 150.00	<LOD = 195.00	9939.20 ± 480.00	603.60 ± 360.00	<LOD = 4048.80
98		4/15/2002 11:20:38	<LOD = 17.85	172.60 ± 14.70	65.00 ± 12.30	90.10 ± 25.00	90.80 ± 32.40	<LOD = 37.80	<LOD = 5.25	156.40 ± 41.60	<LOD = 91.20	<LOD = 180.00	275.00 ± 160.00	10496.00 ± 560.00	965.60 ± 430.00	<LOD = 4948.80
99		4/15/2002 11:41:17	<LOD = 18.90	212.20 ± 15.90	71.00 ± 12.50	106.90 ± 25.90	<LOD = 44.10	<LOD = 34.20	<LOD = 4.80	92.50 ± 36.80	<LOD = 87.75	<LOD = 180.00	<LOD = 255.00	13094.40 ± 620.00	764.40 ± 450.00	<LOD = 4800.00
100		4/15/2002 11:44:22	<LOD = 25.05	518.40 ± 27.00	77.20 ± 14.60	124.00 ± 30.60	79.60 ± 36.80	<LOD = 42.45	<LOD = 6.45	162.80 ± 46.60	<LOD = 100.80	<LOD = 195.00	295.60 ± 170.00	10496.00 ± 610.00	<LOD = 675.00	<LOD = 5097.60
101		4/15/2002 11:47:24	22.80 ± 9.40	72.60 ± 8.70	56.50 ± 9.70	72.50 ± 19.90	624.00 ± 45.00	<LOD = 54.45	<LOD = 6.45	613.20 ± 54.40	178.80 ± 72.30	<LOD = 225.00	476.00 ± 220.00	39475.20 ± 989.60	1269.60 ± 590.00	<LOD = 5846.40
102		4/15/2002 11:53:16	<LOD = 21.30	47.80 ± 12.80	45.10 ± 14.60	<LOD = 40.35	148.00 ± 44.60	<LOD = 56.85	<LOD = 8.40	546.80 ± 83.20	<LOD = 147.45	<LOD = 240.00	<LOD = 300.00	10598.40 ± 740.00	860.00 ± 570.00	<LOD = 6148.80
103		4/15/2002 11:55:29	<LOD = 27.00	296.80 ± 25.60	55.60 ± 16.50	129.20 ± 37.50	<LOD = 57.75	<LOD = 45.75	<LOD = 7.05	89.80 ± 49.50	<LOD = 112.65	<LOD = 240.00	<LOD = 300.00	9958.40 ± 740.00	<LOD = 825.00	<LOD = 6148.80
104		4/15/2002 12:08:30	<LOD = 17.25	99.00 ± 12.40	95.40 ± 13.80	76.20 ± 25.20	165.90 ± 37.10	<LOD = 44.40	<LOD = 6.30	309.20 ± 51.70	<LOD = 100.65	<LOD = 195.00	<LOD = 240.00	12396.80 ± 620.00	764.40 ± 460.00	<LOD = 5097.60
105		4/15/2002 12:11:56	<LOD = 13.95	86.20 ± 9.80	51.40 ± 9.80	74.90 ± 20.10	143.10 ± 29.50	<LOD = 37.80	<LOD = 5.25	292.00 ± 42.50	<LOD = 84.45	<LOD = 165.00	401.40 ± 160.00	15488.00 ± 600.00	639.20 ± 420.00	<LOD = 4348.80
106		4/15/2002 12:18:59	<LOD = 21.60	159.60 ± 18.60	116.10 ± 18.50	62.40 ± 30.90	117.70 ± 42.80	<LOD = 53.70	<LOD = 7.50	497.20 ± 76.60	<LOD = 136.05	<LOD = 255.00	<LOD = 345.00	15897.60 ± 900.00	<LOD = 915.00	<LOD = 6446.40
107		4/15/2002 12:21:00	<LOD = 25.80	82.80 ± 17.30	64.20 ± 18.30	52.40 ± 33.40	89.90 ± 47.20	<LOD = 58.50	<LOD = 8.40	215.20 ± 67.90	<LOD = 136.65	<LOD = 240.00	<LOD = 330.00	10400.00 ± 840.00	<LOD = 945.00	<LOD = 6748.80
108		4/15/2002 12:23:16	<LOD = 9.60	19.30 ± 5.20	33.00 ± 6.90	24.10 ± 13.20	689.20 ± 37.40	<LOD = 45.45	6.20 ± 3.70	550.40 ± 42.90	392.40 ± 56.90	<LOD = 119.85	241.80 ± 98.90	10400.00 ± 360.00	1280.00 ± 280.00	<LOD = 3000.00
109	Shutter Cal 1	4/15/2002 13:47:30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
110		4/15/2002 13:48:00	<LOD = 14.85	113.40 ± 10.90	44.70 ± 9.70	80.70 ± 20.70	150.00 ± 30.50	<LOD = 36.00	<LOD = 4.80	228.40 ± 39.50	<LOD = 77.55	<LOD = 138.15	<LOD = 180.00	8428.80 ± 440.00	609.60 ± 340.00	<LOD = 3600.00
111		4/15/2002 13:51:08	<LOD = 15.15	104.40 ± 10.90	43.30 ± 9.80	64.00 ± 19.90	95.30 ± 27.80	<LOD = 33.15	<LOD = 4.65	177.00 ± 38.10	<LOD = 80.10	<LOD = 143.25	<LOD = 180.00	7724.80 ± 430.00	628.40 ± 340.00	<LOD = 3600.00
112		4/15/2002 13:57:30	<LOD = 18.45	148.80 ± 14.10	86.30 ± 13.40	86.50 ± 25.70	200.80 ± 39.00	<LOD = 46.80	<LOD = 6.60	313.00 ± 51.50	<LOD = 100.20	<LOD = 195.00	305.00 ± 180.00	14195.20 ± 660.00	<LOD = 690.00	<LOD = 5097.60
113		4/15/2002 13:59:57	<LOD = 16.20	126.40 ± 12.50	100.60 ± 13.10	103.10 ± 25.50	343.00 ± 43.00	<LOD = 51.45	<LOD = 6.30	282.80 ± 45.90	<LOD = 87.90	<LOD = 165.00	<LOD = 225.00	12697.60 ± 580.00	2179.20 ± 470.00	<LOD = 4948.80
114		4/15/2002 14:09:30	<LOD = 17.55	125.10 ± 13.30	78.50 ± 13.20	99.00 ± 26.70	290.20 ± 43.80	<LOD = 53.10	<LOD = 7.05	682.40 ± 71.20	193.80 ± 85.40	<LOD = 195.00	<LOD = 255.00	13696.00 ± 660.00	2449.60 ± 530.00	<LOD = 5400.00
115		4/15/2002 14:12:30	<LOD = 19.05	215.00 ± 16.50	93.60 ± 13.90	108.20 ± 27.40	163.40 ± 37.80	<LOD = 44.85	<LOD = 5.85	304.40 ± 50.80	<LOD = 99.15	<LOD = 210.00	399.00 ± 180.00	15091.20 ± 690.00	<LOD = 705.00	5468.80 ± 3497.60
116		4/15/2002 14:18:21	<LOD = 20.25	150.50 ± 15.70	86.30 ± 15.00	121.10 ± 31.10	252.20 ± 47.20	<LOD = 56.10	<LOD = 7.65	379.80 ± 61.90	<LOD = 120.15	<LOD = 225.00	<LOD = 300.00	16000.00 ± 790.00	2440.00 ± 610.00	<LOD = 6297.60
117		4/15/2002 14:21:00	<LOD = 14.85	37.10 ± 8.60	50.90 ± 10.80	34.50 ± 20.10	546.40 ± 49.00	<LOD = 59.85	<LOD = 7.50	766.80 ± 67.90	196.00 ± 79.20	<LOD = 195.00	464.40 ± 190.00	19596.80 ± 750.00	4828.80 ± 600.00	<LOD = 6000.00
118		4/15/2002 14:38:46	<LOD = 18.30	146.00 ± 14.10	107.10 ± 14.30	95.60 ± 26.70	209.20 ± 39.60	<LOD = 46.05	<LOD = 6.15	407.60 ± 56.30	<LOD = 106.20	<LOD = 210.00	<LOD = 285.00	17497.60 ± 740.00	<LOD = 750.00	<LOD = 5246.40
119		4/15/2002 14:41:43	<LOD = 16.35	70.40 ± 10.40	65.50 ± 11.90	113.70 ± 26.20	461.60 ± 48.80	<LOD = 58.35	<LOD = 7.50	530.80 ± 61.10	199.30 ± 79.30	<LOD = 225.00	462.80 ± 230.00	29286.40 ± 980.00	5849.60 ± 730.00	<LOD = 7046.40
120		4/15/2002 14:53:37	<LOD = 19.50	189.40 ± 16.30	92.80 ± 14.40	116.70 ± 29.00	101.50 ± 36.30	<LOD = 43.80	<LOD = 6.15	121.50 ± 42.30	<LOD = 98.70	<LOD = 210.00	325.20 ± 190.00	14092.80 ± 700.00	2899.20 ± 570.00	<LOD = 6000.00
121		4/15/2002 14:56:02	<LOD = 15.15	108.10 ± 10.70	101.00 ± 12.10	90.30 ± 23.50	776.40 ± 52.80	<LOD = 62.25	<LOD = 7.35	577.20 ± 56.00	<LOD = 107.70	<LOD = 210.00	411.60 ± 190.00	27392.00 ± 820.00	1560.00 ± 540.00	<LOD = 5548.80
122		4/15/2002 15:01:46	<LOD = 11.70	83.40 ± 7.90	53.90 ± 8.40	91.20 ± 18.20	618.00 ± 39.60	<LOD = 48.15	<LOD = 5.70	261.00 ± 34.10	<LOD = 72.30	<LOD = 165.00	487.60 ± 170.00	31385.60 ± 740.00	<LOD = 690.00	<LOD = 4648.80
123		4/15/2002 15:06:45	<LOD = 19.05	180.10 ± 15.80	126.40 ± 15.50	92.30 ± 27.40	101.50 ± 34.80	<LOD = 40.50	<LOD = 6.00	198.00 ± 45.60	<LOD = 93.90	<LOD = 180.00	<LOD = 210.00	8569.60 ± 520.00	<LOD = 585.00	<LOD = 4500.00
124		4/15/2002 15:09:24	<LOD = 13.95	141.00 ± 10.70	110.50 ± 11.20	93.00 ± 21.00	522.80 ± 41.00	<LOD = 48.15	<LOD = 5.85	823.20 ± 57.40	<LOD = 96.75	<LOD = 180.00	270.00 ± 170.00	25689.60 ± 710.00	<LOD = 690.00	<LOD = 4648.80
125		4/15/2002 15:31:53	<LOD = 20.25	206.20 ± 16.80	83.30 ± 13.80	94.60 ± 26.90	<LOD = 46.65	<LOD = 39.45	<LOD = 5.70	275.80 ± 51.70	<LOD = 106.65	<LOD = 210.00	496.40 ± 190.00	14988.80 ± 710.00	<LOD = 705.00	<LOD = 5246.40
126		4/15/2002 15:34:43	<LOD = 19.50	127.70 ± 14.70	113.90 ± 15.90	97.60 ± 29.60	308.20 ± 48.50	<LOD = 58.50	<LOD = 7.65	640.80 ± 74.40	148.90 ± 90.60	<LOD = 240.00	<LOD = 330.00	19993.60 ± 880.00	2979.20 ± 660.00	<LOD = 6600.00
127		4/15/2002 15:58:35	<LOD = 16.65	61.70 ± 10.50	67.50 ± 12.20	79.80 ± 24.20	166.30 ± 36.20	<LOD = 44.55	<LOD = 6.45	1009.60 ± 81.20	<LOD = 127.65	<LOD = 210.00	311.00 ± 180.00	15795.20 ± 700.00	<LOD = 720.00	<LOD = 5400.00
128		4/15/2002 16:04:46	<LOD = 14.85	77.90 ± 10.30	48.10 ± 10.40	106.20 ± 23.40	54.80 ± 27.70	<LOD = 32.85	<LOD = 4.80	581.20 ± 59.00	<LOD = 101.10	<LOD = 180.00	337.60 ± 160.00	12697.60 ± 570.00	<LOD = 615.00	<LOD = 4500.00
129		4/15/2002 16:07:55	<LOD = 13.35	44.60 ± 7.90	36.90 ± 8.90	66.10 ± 18.70	171.50 ± 29.90	<LOD = 37.05	<LOD = 6.15	1748.80 ± 89.70	<LOD = 125.10	<LOD = 165.00	321.00 ± 150.00	14988.80 ± 570.00	<LOD = 600.00	<LOD = 4200.00
130		4/15/2002 16:12:44	<LOD = 16.35	114.30 ± 12.30	67.40 ± 12.10	142.90 ± 27.60	131.00 ± 35.00	<LOD = 41.25	<LOD = 5.55	804.00 ± 71.60	<LOD = 118.20	<LOD = 195.00	295.60 ± 190.00	17894.40 ± 730.00	<LOD = 765.00	<LOD = 5400.00
131		4/15/2002 16:18:51	<LOD = 13.05	57.80 ± 8.60	47.30 ± 9.40	89.10 ± 20.20	63.10 ± 24.90	<LOD = 29.40	<LOD = 4.50	596.00 ± 54.10	<LOD = 88.80	<LOD = 150.00	<LOD = 195.00	9984.00 ± 460.00	<LOD = 510.00	<LOD = 3748.80
132		4/15/2002 16:21:16	<LOD = 9.90	68.60 ± 6.70	44.40 ± 7.10	76.90 ± 15.20	418.40 ± 30.30	<LOD = 37.05	<LOD = 4.65	943.20 ± 50.20	86.60 ± 53.60	<LOD = 126.00	236.80 ± 110.00	14988.80 ± 430.00	658.00 ± 300.00	<LOD = 3300.00
133		4/15/2002 16:26:05	<LOD = 11.85	37.30 ± 7.10	22.80 ± 7.60	56.80 ± 16.50	69.50 ± 22.60	<LOD = 27.00	<LOD = 4.50	785.20 ± 57.80	<LOD = 87.75	<LOD = 123.60	164.40 ± 100.00	6604.80 ± 350.00	<LOD = 405.00	<LOD = 3148.80
134		4/15/2002 16:28:36	<LOD = 9.60	24.20 ± 5.40	10.50 ± 5.80	33.20 ± 12.10	52.90 ± 17.30	<LOD = 21.45	<LOD = 3.30	398.80 ± 36.90	<LOD = 61.95	<LOD = 91.80	132.70 ± 71.50	3929.60 ± 240.00	320.60 ± 200.00	<LOD = 2400.00
135		4/15/2002 16:45:15	<LOD = 13.05	84.70 ± 9.30	28.90 ± 8.40	49.00 ± 17.00	105.20 ± 25.60	<LOD = 31.35	<LOD = 4.95	873.60 ± 63.80	<LOD = 100.20	<LOD = 139.80	<LOD = 180.00	8307.20 ± 410.00	703.60 ± 320.00	<LOD = 3600.00
136		4/15/2002 16:48:05	<LOD = 15.90	163.90 ± 13.00	56.00 ± 10.60	84.30 ± 21.90	121.10 ± 30.20	<LOD = 37.05	<LOD = 5.10	888.80 ± 69.70	<LOD = 110.55	<LOD = 165.00	<LOD = 225.00	12800.00 ± 560.00	<LOD = 600.00	<LOD = 4348.80
137		4/15/2002 16:50:42	<LOD = 16.50	178.90 ± 13.60	51.10 ± 10.50	60.70 ± 20.20	40.90 ± 25.10	<LOD = 30.90	<LOD = 4.95	311.20 ± 45.50	<LOD = 84.15	<LOD = 150.00	<LOD = 195.00	9568.00 ± 480.00	<LOD = 540.00	<LOD = 4048.80
138		4/15/2002 16:53:17	<LOD = 18.60	25.50 ± 11.00	130.50 ± 17.20	<LOD = 36.45	60.10 ± 33.80	<LOD = 41.55	<LOD = 7.20	738.00 ± 82.50	<LOD = 141.15	410.40 ± 150.00	<LOD = 210.00	5689.60 ± 480.00	<LOD = 570.00	<LOD = 4800.00
139		4/15/2002 17:00:58	<LOD = 16.05	136.10 ± 12.30	74.50 ± 11.60	123.40 ± 24.90	97.40 ± 31.00	<LOD = 36.30	<LOD = 5.25	342.80 ± 48.10	<LOD = 94.20	<LOD = 180.00	<LOD = 255.00	17689.60 ± 680.00	<LOD = 690.00	<LOD = 4800.00
140		4/15/2002 17:06:03	<LOD = 20.85	224.20 ± 17.80	82.30 ± 14.10	81.00 ± 26.60	<LOD = 44.25	<LOD = 35.25	<LOD = 5.55	127.40 ± 43.20	<LOD = 98.55	<LOD = 195.00	<LOD = 255.00	11296.00 ± 620.00	<LOD = 660.00	<LOD = 4948.80
141		4/15/2002 17:10:42	<LOD = 21.30	95.30 ± 14.10	49.40 ± 13.70	92.30 ± 29.50	127.10 ± 41.40	<LOD = 48.75	<LOD = 7.05	285.40 ± 59.70	<LOD = 124.50	<LOD = 240.00	<LOD = 345.00	17689.60 ± 880.00	<LOD = 900.00	<LOD = 6148.80
142		4/15/2002 17:13:46	<LOD = 17.25	114.40 ± 12.90	72.50 ± 12.90	118.20 ± 27.60	172.10 ± 38.50	<LOD = 47.10	<LOD = 6.45	680.80 ± 69.90	<LOD = 121.05	<LOD = 225.00	446.80 ± 210.00	20390.40 ± 829.60	875.20 ± 560.00	<LOD = 6000.00
143		4/15/2002 17:20:48	<LOD = 16.05	94.80 ± 11.20	69.00 ± 11.60	81.90 ± 22.70	<LOD = 40.05	<LOD = 32.25	<LOD = 4.80	220.20 ± 42.60	<LOD = 88.35	<LOD = 165.00	272.40 ± 140.00	10195.20 ± 520.00	<LOD = 585.00	<LOD = 4348.80
144		4/15/2002 17:24:09	<LOD = 20.40	91.40 ± 13.50	70.80 ± 14.20	101.90 ± 29.30	<LOD = 48.60	<LOD = 38.55	<LOD = 5.40	195.30 ± 49.50	<LOD = 102.45	<LOD = 210.00	310.20 ± 180.00	11200.00 ± 660.00	<LOD = 720.00	<LOD = 5246.40
145		4/15/2002 17:27:41	<LOD = 18.00	60.10 ± 11.00	60.30 ± 12.60	79.20 ± 25.20	110.60 ± 34.90	<LOD = 41.40	<LOD = 5.70	294.40 ± 52.50	<LOD = 103.05	<LOD = 195.00	<LOD = 240.00	11398.40 ± 610.00	<LOD = 675.00	<LOD = 4800.00
146		4/15/2002 17:31:06	<LOD = 14.25	68.20 ± 10.00	60.10 ± 10.90	72.60 ± 21.40	44.10 ± 26.00	<LOD = 30.90	<LOD = 4.50	212.40 ± 41.00	<LOD = 82.80	<LOD = 165.00	<LOD = 195.00	9644.80 ± 500.00	<LOD = 555.00	<LOD = 4200.00
147	Shutter Cal 1	4/16/2002 07:19:55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
148		4/16/2002 07:50:12	<LOD = 20.25	103.50 ± 13.50	48.00 ± 12.70	65.70 ± 25.50	144.40 ± 38.80	<LOD = 46.05	<LOD = 6.75	245.20 ± 53.30	<LOD = 111.75	<LOD = 210.00	<LOD = 285.00	14592.00 ± 740.00	<LOD = 780.00	<LOD = 5697.60
149		4/16/2002 07:53:14	<LOD = 13.95	68.80 ± 8.90	46.00 ± 9.20	51.40 ± 17.60	73.20 ± 24.20	<LOD = 29.25	<LOD = 4.20	150.40 ± 33.50	<LOD = 71.40	<LOD = 131.55	<LOD = 165.00	8505.60 ± 420.00	660.40 ± 330.00	<LOD = 3748.80
150		4/16/2002 07:58:23	<LOD = 14.10	58.10 ± 9.00	36.50 ± 9.50	110.80 ± 22.70	146.60 ± 31.40	<LOD = 36.90	<LOD = 4.95	278.40 ± 43.00	<LOD = 83.55	<LOD = 150.00	<LOD = 225.00	12697.60 ± 550.00	928.00 ± 410.00	<LOD = 4348.80
151		4/16/2002 08:01:22	<LOD = 13.35	63.50 ± 8.90	41.50 ± 9.30	99.20 ± 21.20	172.20 ± 31.10	<LOD = 36.30	<LOD = 4.50	245.20 ± 39.50	<LOD = 79.35	<LOD = 150.00	309.00 ± 140.00	11494.40 ± 500.00	684.80 ± 370.00	<LOD = 3900.00
152		4/16/2002 08:09:14	<LOD = 18.15	98.90 ± 12.80	85.80 ± 13.80	85.30 ± 26.30	152.30 ± 37.60	<LOD = 45.00	<LOD = 6.00	189.50 ± 45.90	<LOD = 97.20	<LOD = 180.00	<LOD = 240.00	11296.00 ± 610.00	1009.60 ± 470.00	<LOD = 5097.60
153		4/16/2002 08:13:12	<LOD = 9.00	10.70 ± 4.90	35.90 ± 6.60	16.50 ± 10.90	<LOD = 21.15	<LOD = 16.80	<LOD = 2.55	125.40 ± 23.50	<LOD = 46.35	<LOD = 77.10	<LOD = 76.95	1908.80 ± 170.00	307.60 ± 150.00	<LOD = 1950.00
154		4/16/2002 08:16:59	<LOD = 14.40	105.30 ± 10.60	73.30 ± 10.70	86.40 ± 20.90	42.30 ± 24.30	<LOD = 28.35	<LOD = 4.05	92.90 ± 30.30	<LOD = 68.25	<LOD = 137.25	<LOD = 180.00	8928.00 ± 440.00	853.60 ± 350.00	<LOD = 3900.00
155		4/16/2002 08:19:36	<LOD = 15.90	104.40 ± 11.60	74.40 ± 11.80	75.30 ± 22.50	109.20 ± 30.70	<LOD = 36.60	<LOD = 5.10	109.90 ± 35.00	<LOD = 77.85	<LOD = 150.00	222.00 ± 140.00	9785.60 ± 510.00	1020.00 ± 400.00	<LOD = 4348.80
156		4/16/2002 08:27:28	<LOD = 15.60	66.20 ± 10.30	68.80 ± 11.90	65.30 ± 22.60	270.40 ± 39.60	<LOD = 48.15	<LOD = 6.45	413.20 ± 54.30	<LOD = 101.25	<LOD = 180.00	<LOD = 255.00	14899.20 ± 650.00	1269.60 ± 480.00	<LOD = 4800.00
157		4/16/2002 08:30:19	<LOD = 13.50	86.00 ± 9.90	58.10 ± 10.20	74.10 ± 20.30	143.90 ± 29.70	<LOD = 35.40	<LOD = 4.80	235.60 ± 39.80	<LOD = 81.30	<LOD = 150.00	319.00 ± 140.00	12396.80 ± 530.00	1149.60 ± 400.00	<LOD = 4348.80
158		4/16/2002 08:38:14	<LOD = 18.30	197.00 ± 15.40	50.90 ± 11.50	79.30 ± 23.40	<LOD = 39.75	<LOD = 30.90	<LOD = 4.35	<LOD = 47.85	<LOD = 80.10	<LOD = 148.35	<LOD = 195.00	7366.40 ± 460.00	<LOD = 525.00	<LOD = 4048.80
159		4/16/2002 08:41:01	<LOD = 14.40	140.10 ± 11.20	47.30 ± 9.30	68.90 ± 18.70	48.00 ± 23.10	<LOD = 27.45	<LOD = 4.20	65.70 ± 27.10	<LOD = 62.10	<LOD = 125.85	<LOD = 165.00	6726.40 ± 370.00	751.60 ± 300.00	<LOD = 3300.00
160		4/16/2002 08:46:42	<LOD = 19.05	95.20 ± 12.90	37.90 ± 11.90	83.50 ± 26.10	80.30 ± 34.60	<LOD = 40.80	<LOD = 6.30	141.60 ± 45.00	<LOD = 101.55	<LOD = 195.00	<LOD = 255.00	10598.40 ± 620.00	860.80 ± 470.00	<LOD = 5097.60
161		4/16/2002 08:49:20	<LOD = 16.20	158.60 ± 12.80	38.60 ± 9.70	56.00 ± 19.20	<LOD = 33.60	<LOD = 25.05	<LOD = 3.45	<LOD = 41.10	<LOD = 65.55	<LOD = 130.05	<LOD = 165.00	5468.80 ± 370.00	469.60 ± 300.00	<LOD = 3300.00
162		4/16/2002 08:54:39	<LOD = 16.65	139.70 ± 12.70	52.30 ± 10.70	61.00 ± 20.70	<LOD = 36.90	<LOD = 29.10	<LOD = 4.50	58.10 ± 31.50	<LOD = 76.35	<LOD = 144.90	<LOD = 180.00	8089.60 ± 460.00	620.80 ± 360.00	<LOD = 4048.80
163		4/16/2002 08:57:36	<LOD = 14.85	117.30 ± 11.40	36.30 ± 9.50	60.00 ± 19.40	<LOD = 32.70	<LOD = 26.70	<LOD = 4.20	63.80 ± 30.40	<LOD = 73.05	<LOD = 139.65	<LOD = 180.00	7315.20 ± 420.00	728.80 ± 340.00	<LOD = 3900.00
164		4/16/2002 09:22:09	<LOD = 18.90	69.90 ± 12.20	40.00 ± 12.70	97.10 ± 29.00	315.40 ± 50.50	<LOD = 63.30	<LOD = 7.80	265.80 ± 56.50	<LOD = 121.80	<LOD = 270.00	<LOD = 420.00	32000.00 ± 1200.00	1739.20 ± 780.00	<LOD = 7800.00
165		4/16/2002 09:25:22	<LOD = 17.40	148.80 ± 13.70	84.00 ± 12.90	123.30 ± 26.80	45.80 ± 29.90	<LOD = 34.95	<LOD = 4.50	95.90 ± 36.60	<LOD = 87.15	<LOD = 180.00	260.20 ± 160.00	11494.40 ± 580.00	969.60 ± 440.00	<LOD = 4800.00
166		4/16/2002 09:28:22	<LOD = 16.80	150.20 ± 13.50	69.70 ± 12.00	98.30 ± 24.60	67.40 ± 30.00	<LOD = 35.70	<LOD = 4.80	197.70 ± 41.90	<LOD = 86.40	<LOD = 180.00	265.00 ± 160.00	13196.80 ± 610.00	1449.60 ± 470.00	<LOD = 4948.80
167		4/16/2002 09:31:08	<LOD = 20.70	134.40 ± 15.50	74.50 ± 14.60	86.90 ± 28.70	<LOD = 50.85	<LOD = 41.10	<LOD = 6.00	148.20 ± 47.60	<LOD = 105.75	<LOD = 210.00	<LOD = 285.00	12697.60 ± 710.00	836.80 ± 520.00	<LOD = 5697.60
168		4/16/2002 09:41:36	<LOD = 16.05	114.70 ± 11.70	74.10 ± 11.50	89.40 ± 22.70	47.30 ± 26.60	<LOD = 32.55	<LOD = 4.80	380.40 ± 49.80	<LOD = 92.55	<LOD = 165.00	<LOD = 195.00	8908.80 ± 470.00	792.80 ± 370.00	<LOD = 4048.80
169		4/16/2002 09:44:25	<LOD = 13.80	116.40 ± 10.40	42.20 ± 8.90	48.70 ± 17.10	49.80 ± 22.20	<LOD = 25.80	<LOD = 3.60	269.60 ± 39.20	<LOD = 74.85	<LOD = 125.70	<LOD = 165.00	7539.20 ± 390.00	769.20 ± 310.00	<LOD = 3448.80
170		4/16/2002 09:49:28	<LOD = 16.05	107.10 ± 11.50	55.60 ± 10.90	76.20 ± 21.90	76.90 ± 28.50	<LOD = 35.25	<LOD = 5.10	474.80 ± 55.10	<LOD = 96.75	<LOD = 165.00	<LOD = 210.00	10796.80 ± 530.00	827.20 ± 410.00	<LOD = 4500.00
171		4/16/2002 09:52:19	<LOD = 14.55	90.50 ± 10.50	44.80 ± 10.10	77.80 ± 21.30	148.50 ± 31.60	<LOD = 38.10	<LOD = 4.80	821.60 ± 68.40	141.80 ± 76.60	<LOD = 180.00	<LOD = 270.00	19494.40 ± 720.00	1489.60 ± 510.00	<LOD = 5097.60
172		4/16/2002 09:59:38	<LOD = 18.60	103.60 ± 13.20	70.20 ± 13.40	54.10 ± 24.30	132.20 ± 36.50	<LOD = 43.80	<LOD = 6.15	455.20 ± 63.20	<LOD = 115.80	<LOD = 195.00	<LOD = 255.00	11596.80 ± 640.00	965.60 ± 480.00	<LOD = 5246.40
173		4/16/2002 10:02:07	<LOD = 17.55	92.10 ± 12.20	45.70 ± 11.70	88

Site: Date: 4/16/2002

No	Cor1	Date/Time	Mo ± Prec	Zr ± Prec	Sr ± Prec	Rh ± Prec	Pb ± Prec	As ± Prec	Hg ± Prec	Zn ± Prec	Cu ± Prec	Ni ± Prec	Co ± Prec	Fe ± Prec	Mn ± Prec	Cr ± Prec
180		4/16/2002 11:09:10	<LOD = 14.55	107.10 ± 10.90	59.30 ± 10.60	70.50 ± 20.90	269.20 ± 36.40	<LOD = 43.80	<LOD = 5.40	297.60 ± 44.10	<LOD = 85.20	<LOD = 165.00	<LOD = 210.00	11097.60 ± 510.00	1129.60 ± 400.00	<LOD = 4348.80
181		4/16/2002 11:12:13	<LOD = 11.55	47.10 ± 7.20	80.00 ± 9.30	83.40 ± 18.40	498.00 ± 37.10	<LOD = 45.30	<LOD = 5.55	682.80 ± 49.90	104.40 ± 60.10	<LOD = 180.00	321.60 ± 180.00	31488.00 ± 760.00	2948.80 ± 510.00	<LOD = 5097.60
182		4/16/2002 11:19:16	<LOD = 12.90	152.60 ± 10.50	55.90 ± 8.80	69.40 ± 17.30	74.90 ± 22.50	<LOD = 27.45	<LOD = 3.90	101.80 ± 27.70	<LOD = 63.00	<LOD = 120.30	<LOD = 150.00	8428.80 ± 380.00	701.20 ± 290.00	<LOD = 3300.00
183		4/16/2002 11:22:31	<LOD = 17.25	138.60 ± 13.00	49.70 ± 11.00	75.10 ± 22.30	60.50 ± 28.20	<LOD = 34.65	<LOD = 4.95	143.60 ± 38.20	<LOD = 82.20	<LOD = 150.00	240.60 ± 130.00	7827.20 ± 470.00	802.40 ± 370.00	<LOD = 4200.00
184		4/16/2002 11:29:31	<LOD = 13.50	146.50 ± 10.90	89.40 ± 10.30	81.40 ± 19.10	<LOD = 32.10	<LOD = 24.45	<LOD = 3.75	77.80 ± 26.50	<LOD = 60.15	<LOD = 115.65	192.40 ± 96.40	6000.00 ± 330.00	673.20 ± 270.00	<LOD = 3000.00
185		4/16/2002 11:32.26	<LOD = 16.80	139.70 ± 12.80	95.50 ± 12.60	90.10 ± 23.50	55.30 ± 27.70	<LOD = 32.10	<LOD = 4.50	143.30 ± 37.20	<LOD = 81.90	<LOD = 150.00	195.80 ± 130.00	7897.60 ± 450.00	1320.00 ± 380.00	<LOD = 4200.00
186		4/16/2002 11:52:14	<LOD = 11.40	108.10 ± 8.30	64.60 ± 8.50	94.50 ± 18.00	699.20 ± 40.20	<LOD = 48.60	<LOD = 5.70	268.60 ± 33.00	<LOD = 63.45	<LOD = 115.35	208.20 ± 99.80	9849.60 ± 360.00	1329.60 ± 290.00	<LOD = 3148.80
187		4/16/2002 11:56:43	<LOD = 10.35	100.30 ± 7.60	62.00 ± 7.70	86.50 ± 15.90	409.40 ± 30.30	<LOD = 36.45	<LOD = 4.35	189.20 ± 27.40	<LOD = 55.80	<LOD = 100.20	130.90 ± 85.80	8236.80 ± 310.00	1600.00 ± 270.00	<LOD = 2848.80
188		4/16/2002 12:01:39	<LOD = 16.20	116.90 ± 12.00	64.50 ± 11.50	85.80 ± 23.20	189.30 ± 35.30	<LOD = 42.00	<LOD = 5.55	193.00 ± 41.00	<LOD = 84.60	<LOD = 150.00	<LOD = 195.00	9964.80 ± 510.00	1100.00 ± 400.00	<LOD = 4500.00
189		4/16/2002 12:13:48	<LOD = 16.35	162.10 ± 13.20	49.60 ± 10.50	78.10 ± 21.60	<LOD = 38.55	<LOD = 28.95	<LOD = 4.65	96.30 ± 33.50	<LOD = 76.35	<LOD = 150.00	<LOD = 195.00	8320.00 ± 460.00	1040.00 ± 370.00	<LOD = 4048.80
190		4/16/2002 12:16:54	<LOD = 15.15	91.80 ± 10.30	24.70 ± 8.80	40.30 ± 17.40	<LOD = 34.20	<LOD = 28.05	<LOD = 4.20	135.20 ± 34.70	<LOD = 73.20	<LOD = 128.10	<LOD = 150.00	5548.80 ± 360.00	<LOD = 435.00	<LOD = 3300.00
191		4/16/2002 12:23.58	<LOD = 18.30	123.90 ± 13.50	105.20 ± 14.50	104.30 ± 27.90	310.80 ± 45.50	<LOD = 53.10	<LOD = 7.05	313.20 ± 53.10	113.20 ± 71.10	<LOD = 195.00	302.60 ± 180.00	15296.00 ± 700.00	2129.60 ± 540.00	<LOD = 5697.60
192		4/16/2002 12:26:40	<LOD = 16.65	146.80 ± 13.20	66.10 ± 11.80	102.20 ± 24.80	191.00 ± 36.60	<LOD = 44.25	<LOD = 6.15	278.00 ± 47.50	139.60 ± 64.10	<LOD = 165.00	247.00 ± 160.00	13094.40 ± 620.00	4880.00 ± 560.00	<LOD = 5548.80
193		4/16/2002 12:33:06	<LOD = 18.45	216.80 ± 16.20	82.60 ± 13.00	76.10 ± 24.20	<LOD = 41.85	<LOD = 33.75	<LOD = 5.25	<LOD = 50.25	<LOD = 84.00	<LOD = 165.00	<LOD = 210.00	8896.00 ± 510.00	789.60 ± 400.00	<LOD = 4348.80
194		4/16/2002 12:35:19	<LOD = 19.65	160.50 ± 15.40	78.20 ± 13.80	85.10 ± 26.70	94.30 ± 35.00	<LOD = 41.40	<LOD = 6.00	139.80 ± 43.80	<LOD = 97.95	<LOD = 180.00	<LOD = 240.00	9158.40 ± 560.00	2108.80 ± 480.00	<LOD = 5097.60
195		4/16/2002 12:40:48	<LOD = 15.60	152.50 ± 12.40	63.30 ± 10.60	56.40 ± 19.40	<LOD = 34.95	<LOD = 27.00	<LOD = 4.20	70.80 ± 30.30	<LOD = 72.45	<LOD = 141.15	166.00 ± 110.00	6816.00 ± 400.00	1000.00 ± 330.00	<LOD = 3748.80
196		4/16/2002 12:43:19	20.90 ± 12.70	117.70 ± 13.30	83.10 ± 13.40	89.10 ± 25.90	86.40 ± 33.10	<LOD = 40.95	<LOD = 5.70	175.00 ± 44.80	108.10 ± 65.80	<LOD = 180.00	<LOD = 240.00	11097.60 ± 600.00	3188.80 ± 530.00	<LOD = 5400.00
197		4/16/2002 12:45:19	20.90 ± 12.70	117.70 ± 13.30	83.10 ± 13.40	89.10 ± 25.90	86.40 ± 33.10	<LOD = 40.95	<LOD = 5.70	175.00 ± 44.80	108.10 ± 65.80	<LOD = 180.00	<LOD = 240.00	11097.60 ± 600.00	3188.80 ± 530.00	<LOD = 5400.00
198	Shutter Cal 1	4/16/2002 13:53:52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
199		4/16/2002 14:04:20	<LOD = 19.20	123.90 ± 13.80	68.00 ± 13.20	124.80 ± 28.90	129.10 ± 37.80	<LOD = 44.55	<LOD = 6.00	331.40 ± 54.70	<LOD = 106.65	<LOD = 225.00	<LOD = 315.00	18790.40 ± 820.00	<LOD = 825.00	<LOD = 5846.40
200		4/16/2002 14:07:03	<LOD = 17.70	108.60 ± 13.00	69.10 ± 12.90	100.00 ± 26.50	<LOD = 44.25	<LOD = 36.15	<LOD = 5.55	185.90 ± 44.40	<LOD = 91.80	<LOD = 180.00	<LOD = 240.00	10995.20 ± 600.00	<LOD = 660.00	<LOD = 4948.80
201		4/16/2002 14:13:56	<LOD = 15.90	94.50 ± 11.20	55.70 ± 11.10	130.10 ± 25.70	107.40 ± 32.20	<LOD = 39.30	<LOD = 5.10	182.40 ± 40.10	<LOD = 84.45	<LOD = 180.00	<LOD = 240.00	14796.80 ± 630.00	<LOD = 660.00	<LOD = 4648.80
202		4/16/2002 14:16:34	<LOD = 13.50	69.80 ± 9.10	34.80 ± 9.10	100.20 ± 21.40	167.20 ± 31.30	<LOD = 36.90	<LOD = 4.95	277.00 ± 41.10	<LOD = 78.15	<LOD = 150.00	315.60 ± 140.00	11494.40 ± 510.00	<LOD = 555.00	<LOD = 4048.80
203		4/16/2002 14:24:38	<LOD = 14.25	122.30 ± 11.20	39.70 ± 9.40	49.70 ± 18.10	35.10 ± 22.80	<LOD = 26.85	<LOD = 4.20	109.50 ± 31.80	<LOD = 68.40	<LOD = 130.50	<LOD = 150.00	5817.60 ± 360.00	<LOD = 420.00	<LOD = 3448.80
204		4/16/2002 14:27:27	<LOD = 15.00	107.00 ± 10.80	35.90 ± 9.30	47.30 ± 18.00	<LOD = 32.25	<LOD = 25.95	<LOD = 4.05	<LOD = 39.75	<LOD = 65.85	<LOD = 126.30	<LOD = 147.45	4908.80 ± 340.00	455.20 ± 280.00	<LOD = 3300.00
205		4/16/2002 14:36:13	<LOD = 7.50	25.70 ± 4.30	<LOD = 6.90	39.70 ± 10.70	576.40 ± 28.60	165.30 ± 25.80	<LOD = 4.65	255.00 ± 24.90	46.20 ± 30.00	<LOD = 72.45	112.60 ± 57.70	4627.20 ± 200.00	393.80 ± 160.00	<LOD = 1950.00
206		4/16/2002 14:40:36	<LOD = 19.20	108.40 ± 13.60	57.80 ± 13.10	113.50 ± 28.90	89.20 ± 36.50	<LOD = 43.50	<LOD = 6.15	93.40 ± 42.30	<LOD = 104.55	<LOD = 225.00	<LOD = 300.00	15398.40 ± 760.00	<LOD = 795.00	<LOD = 5697.60
207		4/16/2002 14:58:58	<LOD = 17.10	144.90 ± 13.20	51.30 ± 11.10	84.70 ± 23.10	<LOD = 40.35	<LOD = 33.15	<LOD = 4.80	88.90 ± 34.60	<LOD = 81.60	<LOD = 165.00	355.60 ± 160.00	11200.00 ± 560.00	<LOD = 585.00	<LOD = 4348.80
208		4/16/2002 15:01:34	<LOD = 12.75	82.50 ± 9.00	56.00 ± 9.20	68.20 ± 18.00	37.40 ± 21.40	<LOD = 25.35	<LOD = 3.60	78.40 ± 27.00	<LOD = 62.25	<LOD = 127.05	<LOD = 165.00	7795.20 ± 380.00	<LOD = 420.00	<LOD = 3148.80
209		4/16/2002 15:08:43	<LOD = 17.40	192.50 ± 14.20	55.90 ± 10.90	84.20 ± 22.30	68.60 ± 28.00	<LOD = 33.30	<LOD = 4.50	158.50 ± 37.10	<LOD = 76.95	<LOD = 150.00	<LOD = 210.00	10297.60 ± 510.00	1689.60 ± 420.00	<LOD = 4500.00
210		4/16/2002 15:11:38	<LOD = 15.90	132.80 ± 12.50	71.10 ± 11.70	95.80 ± 23.80	149.00 ± 33.40	<LOD = 40.05	<LOD = 5.40	234.80 ± 43.70	<LOD = 90.30	<LOD = 165.00	295.80 ± 140.00	10099.20 ± 520.00	2099.20 ± 440.00	<LOD = 4648.80
211		4/16/2002 15:46:22	<LOD = 17.25	167.70 ± 14.50	137.90 ± 15.00	98.70 ± 26.40	97.70 ± 32.60	<LOD = 37.20	<LOD = 4.95	125.10 ± 38.60	<LOD = 89.85	<LOD = 195.00	296.80 ± 180.00	15897.60 ± 680.00	<LOD = 690.00	<LOD = 5097.60
212		4/16/2002 15:49:15	25.10 ± 12.40	158.00 ± 14.00	104.80 ± 13.60	108.00 ± 25.90	63.60 ± 30.30	<LOD = 34.65	<LOD = 4.95	136.60 ± 38.80	<LOD = 86.25	<LOD = 165.00	<LOD = 210.00	9408.00 ± 510.00	<LOD = 585.00	<LOD = 4500.00
213		4/16/2002 15:51:46	<LOD = 17.55	119.00 ± 13.10	122.40 ± 14.70	105.50 ± 27.20	166.60 ± 37.30	<LOD = 44.85	<LOD = 6.15	266.40 ± 48.90	<LOD = 101.10	<LOD = 180.00	302.20 ± 170.00	12396.80 ± 610.00	1988.80 ± 490.00	<LOD = 5246.40
214		4/16/2002 15:54:45	<LOD = 17.10	161.00 ± 13.60	97.00 ± 12.90	128.90 ± 26.30	103.00 ± 32.00	<LOD = 36.75	<LOD = 4.65	155.60 ± 38.90	<LOD = 85.65	<LOD = 165.00	<LOD = 210.00	10796.80 ± 530.00	<LOD = 585.00	<LOD = 4348.80
215		4/16/2002 16:02:47	<LOD = 13.95	85.70 ± 9.90	42.90 ± 9.60	75.30 ± 20.20	93.30 ± 27.30	<LOD = 32.70	<LOD = 4.65	146.10 ± 35.10	<LOD = 76.35	<LOD = 149.25	<LOD = 195.00	9856.00 ± 470.00	<LOD = 540.00	<LOD = 4048.80
216		4/16/2002 16:06:14	<LOD = 77.25	129.10 ± 57.90	<LOD = 89.55	<LOD = 210.00	1280.00 ± 370.00	<LOD = 480.00	352.20 ± 84.70	2280.00 ± 929.60	3520.00 ± 2000.00	78489.60 ± 8000.00	<LOD = 2400.00	18892.80 ± 3600.00	<LOD = 3900.00	<LOD = 38995.20
217		4/16/2002 16:06:37	<LOD = 14.55	84.50 ± 9.80	70.60 ± 11.20	49.20 ± 21.90	1409.60 ± 68.60	<LOD = 79.65	<LOD = 8.55	1000.00 ± 68.80	<LOD = 109.80	<LOD = 180.00	300.40 ± 150.00	16000.00 ± 580.00	<LOD = 600.00	<LOD = 4348.80
218		4/16/2002 16:14:59	<LOD = 41.85	85.60 ± 28.00	<LOD = 35.85	<LOD = 67.50	<LOD = 91.05	1029.60 ± 150.00	<LOD = 31.05	<LOD = 123.45	<LOD = 210.00	<LOD = 345.00	<LOD = 300.00	1569.60 ± 610.00	<LOD = 765.00	<LOD = 7646.40
219		4/16/2002 16:15:51	<LOD = 10.95	69.80 ± 7.50	63.70 ± 8.70	74.60 ± 17.90	882.40 ± 45.50	<LOD = 55.05	8.10 ± 4.40	734.40 ± 50.20	148.00 ± 60.30	<LOD = 165.00	332.00 ± 170.00	30489.60 ± 720.00	3369.60 ± 490.00	<LOD = 4948.80
220		4/16/2002 16:38:18	<LOD = 17.70	143.70 ± 13.90	78.20 ± 12.90	77.20 ± 24.30	52.30 ± 29.70	<LOD = 35.55	<LOD = 5.70	167.70 ± 41.80	<LOD = 86.85	<LOD = 165.00	<LOD = 210.00	9164.80 ± 520.00	<LOD = 585.00	<LOD = 4500.00
221		4/16/2002 16:41:16	<LOD = 19.65	144.40 ± 14.50	71.10 ± 13.20	106.20 ± 27.50	149.80 ± 38.00	<LOD = 44.40	<LOD = 5.85	272.40 ± 51.20	<LOD = 103.95	<LOD = 210.00	<LOD = 285.00	16998.40 ± 760.00	<LOD = 780.00	<LOD = 5548.80
222		4/16/2002 16:55:04	<LOD = 18.90	270.60 ± 17.50	109.00 ± 13.90	116.60 ± 26.70	<LOD = 43.80	<LOD = 34.80	<LOD = 5.10	107.30 ± 37.20	<LOD = 86.25	<LOD = 165.00	220.40 ± 140.00	8960.00 ± 500.00	<LOD = 570.00	<LOD = 4348.80
223		4/16/2002 16:57:51	<LOD = 16.80	180.80 ± 13.70	108.70 ± 12.80	100.60 ± 23.90	89.50 ± 29.40	<LOD = 35.55	<LOD = 4.65	183.60 ± 38.50	<LOD = 79.95	<LOD = 150.00	<LOD = 210.00	10796.80 ± 510.00	<LOD = 555.00	<LOD = 4200.00
224		4/16/2002 17:07:19	<LOD = 13.35	49.00 ± 8.80	67.70 ± 10.80	49.00 ± 19.30	137.50 ± 29.70	<LOD = 36.30	<LOD = 5.25	624.80 ± 58.40	<LOD = 96.75	<LOD = 165.00	247.60 ± 150.00	12595.20 ± 550.00	<LOD = 585.00	<LOD = 4348.80
225		4/16/2002 17:10:09	<LOD = 19.95	81.70 ± 12.80	45.70 ± 12.70	64.90 ± 25.60	54.90 ± 33.40	<LOD = 42.75	<LOD = 5.85	222.60 ± 52.30	<LOD = 108.15	<LOD = 195.00	<LOD = 225.00	9049.60 ± 580.00	<LOD = 630.00	<LOD = 4800.00
226		4/16/2002 17:20:36	<LOD = 15.00	65.70 ± 10.10	101.80 ± 12.70	81.10 ± 22.80	<LOD = 36.90	<LOD = 29.55	<LOD = 4.50	53.80 ± 30.00	<LOD = 70.20	<LOD = 133.05	<LOD = 150.00	5049.60 ± 360.00	<LOD = 435.00	<LOD = 3448.80
227		4/16/2002 17.23.21	<LOD = 17.10	138.00 ± 13.20	101.90 ± 13.40	111.20 ± 26.00	<LOD = 43.50	<LOD = 33.60	<LOD = 5.10	200.20 ± 42.70	<LOD = 90.60	<LOD = 180.00	<LOD = 240.00	13299.20 ± 610.00	<LOD = 645.00	<LOD = 4648.80
228		4/16/2002 17.29.43	<LOD = 13.95	83.50 ± 9.40	39.10 ± 8.90	87.70 ± 19.70	<LOD = 32.55	<LOD = 25.80	<LOD = 3.75	93.90 ± 29.60	<LOD = 67.95	<LOD = 133.35	223.00 ± 120.00	8275.20 ± 410.00	<LOD = 465.00	<LOD = 3448.80
229		4/16/2002 17:32.35	<LOD = 17.55	138.40 ± 13.40	50.40 ± 11.40	103.10 ± 25.00	<LOD = 41.40	<LOD = 33.00	<LOD = 4.65	84.60 ± 35.80	<LOD = 84.90	<LOD = 165.00	<LOD = 225.00	11097.60 ± 570.00	<LOD = 615.00	<LOD = 4348.80

Serial #XL700-U1018NR1932 Site: Date: 4/30/2002 to 5/3/2002

No	Cor1	Date/Time	Mo ± Prec	Zr ± Prec	Sr ± Prec	Rb ± Prec	Pb ± Prec	As ± Prec	Hg ± Prec	Zn ± Prec	Cu ± Prec	Ni ± Prec	Co ± Prec	Fe ± Prec	Mn ± Prec	Cr ± Prec
1	Shutter Cal 1	4/30/2002 07:20:39	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	Shutter Cal 1	4/30/2002 10:15:42	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3		4/30/2002 10:25:56	41.50 ± 27.10	<LOD = 23.40	61.10 ± 24.40	<LOD = 80.25	1629.60 ± 180.00	<LOD = 210.00	<LOD = 110.10	505.60 ± 190.00	<LOD = 570.00	<LOD = 1035.00	<LOD = 1125.00	18598.40 ± 3497.60	<LOD = 16492.80	<LOD = 915.00
4		4/30/2002 10:26:59	<LOD = 25.65	21.40 ± 10.10	42.90 ± 15.30	<LOD = 51.60	1469.60 ± 120.00	<LOD = 137.85	<LOD = 72.75	439.60 ± 130.00	<LOD = 375.00	<LOD = 690.00	<LOD = 780.00	17292.80 ± 2400.00	13196.80 ± 7494.40	<LOD = 645.00
5		4/30/2002 10:31:10	<LOD = 27.45	71.60 ± 13.20	149.40 ± 19.50	<LOD = 59.85	265.60 ± 76.20	97.70 ± 63.10	<LOD = 54.15	936.00 ± 160.00	<LOD = 480.00	<LOD = 1080.00	1509.60 ± 900.00	59596.80 ± 4297.60	20390.40 ± 12998.40	<LOD = 1035.00
6	Shutter Cal 1	4/30/2002 12:07:48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Shutter Cal 1	4/30/2002 13:05:28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8		4/30/2002 13:05:37	<LOD = 27.60	26.90 ± 12.00	89.70 ± 20.90	75.40 ± 47.70	4038.40 ± 200.00	<LOD = 225.00	<LOD = 121.35	6905.60 ± 410.00	2539.20 ± 680.00	<LOD = 1185.00	<LOD = 840.00	16294.40 ± 2400.00	<LOD = 10800.00	<LOD = 615.00
9		4/30/2002 13:08:45	<LOD = 18.15	19.50 ± 7.20	43.90 ± 10.10	41.00 ± 22.70	<LOD = 56.25	<LOD = 43.95	<LOD = 24.15	<LOD = 78.60	<LOD = 165.00	<LOD = 300.00	<LOD = 285.00	2308.80 ± 810.00	<LOD = 3900.00	<LOD = 225.00
10		4/30/2002 13:11:44	<LOD = 21.15	20.00 ± 8.30	44.00 ± 12.40	<LOD = 41.55	930.40 ± 81.00	<LOD = 97.35	<LOD = 51.75	900.80 ± 130.00	<LOD = 345.00	<LOD = 525.00	<LOD = 495.00	9459.20 ± 1500.00	<LOD = 6897.60	<LOD = 390.00
11		4/30/2002 13:14:18	<LOD = 18.60	29.40 ± 7.70	31.00 ± 9.90	38.90 ± 22.80	<LOD = 62.10	<LOD = 45.75	<LOD = 24.75	<LOD = 83.40	<LOD = 180.00	<LOD = 345.00	<LOD = 345.00	4857.60 ± 1000.00	<LOD = 4800.00	<LOD = 285.00
12		4/30/2002 13:17:03	<LOD = 17.25	36.40 ± 7.40	31.20 ± 9.50	40.70 ± 22.20	518.80 ± 55.80	<LOD = 66.00	<LOD = 33.60	219.20 ± 71.10	<LOD = 225.00	<LOD = 390.00	<LOD = 420.00	9497.60 ± 1200.00	<LOD = 5846.40	<LOD = 330.00
13		4/30/2002 13:24:06	<LOD = 20.85	53.80 ± 9.40	53.50 ± 12.10	<LOD = 39.45	512.80 ± 64.60	<LOD = 76.80	<LOD = 41.55	664.00 ± 110.00	<LOD = 300.00	<LOD = 510.00	<LOD = 525.00	11897.60 ± 1600.00	<LOD = 7497.60	<LOD = 420.00
14		4/30/2002 13:26:52	<LOD = 20.10	38.80 ± 8.40	21.20 ± 10.00	62.00 ± 25.00	103.40 ± 47.70	<LOD = 56.85	<LOD = 30.90	<LOD = 99.30	<LOD = 210.00	<LOD = 375.00	<LOD = 375.00	4947.20 ± 1100.00	<LOD = 5246.40	<LOD = 300.00
15		4/30/2002 13:42:54	25.80 ± 16.20	21.70 ± 9.50	66.20 ± 14.60	<LOD = 46.95	966.40 ± 89.90	<LOD = 106.35	<LOD = 54.45	464.00 ± 110.00	<LOD = 315.00	<LOD = 480.00	<LOD = 420.00	4918.40 ± 1200.00	<LOD = 5697.60	<LOD = 330.00
16		4/30/2002 13:45:14	<LOD = 30.90	25.40 ± 12.00	54.80 ± 18.10	<LOD = 61.50	1300.00 ± 130.00	<LOD = 147.30	<LOD = 77.70	537.20 ± 150.00	<LOD = 480.00	<LOD = 990.00	<LOD = 1185.00	34892.80 ± 3699.20	32793.60 ± 12000.00	<LOD = 990.00
17		4/30/2002 13:55:20	<LOD = 20.70	<LOD = 10.65	<LOD = 14.55	<LOD = 32.40	<LOD = 63.30	<LOD = 51.45	<LOD = 27.30	<LOD = 100.05	<LOD = 210.00	<LOD = 345.00	<LOD = 300.00	1668.80 ± 840.00	<LOD = 3900.00	<LOD = 240.00
18		4/30/2002 13:58:00	<LOD = 42.90	48.10 ± 19.10	40.20 ± 25.00	<LOD = 90.75	1140.00 ± 180.00	<LOD = 210.00	<LOD = 105.75	1029.60 ± 270.00	<LOD = 735.00	<LOD = 1125.00	<LOD = 1095.00	12896.00 ± 3299.20	<LOD = 14995.20	<LOD = 855.00
19		4/30/2002 13:59:13	<LOD = 23.40	47.60 ± 10.60	68.10 ± 15.10	<LOD = 48.30	1360.00 ± 100.00	<LOD = 122.70	<LOD = 64.05	1149.60 ± 150.00	<LOD = 405.00	<LOD = 615.00	<LOD = 615.00	13196.80 ± 1899.20	<LOD = 8548.80	<LOD = 480.00
20		4/30/2002 14:17:57	<LOD = 19.20	<LOD = 10.95	37.90 ± 10.90	40.60 ± 25.10	561.60 ± 63.80	<LOD = 77.25	<LOD = 40.20	365.40 ± 96.90	508.00 ± 200.00	<LOD = 465.00	<LOD = 405.00	5529.60 ± 1200.00	5760.00 ± 3699.20	<LOD = 315.00
21		4/30/2002 14:25:15	<LOD = 21.90	19.20 ± 8.30	48.00 ± 12.10	40.90 ± 27.20	290.20 ± 58.50	<LOD = 67.95	<LOD = 35.55	267.00 ± 87.10	<LOD = 270.00	<LOD = 465.00	<LOD = 495.00	8678.40 ± 1500.00	<LOD = 7046.40	<LOD = 405.00
22		4/30/2002 14:47:23	36.70 ± 15.40	25.90 ± 8.90	54.70 ± 13.10	<LOD = 43.05	841.60 ± 80.20	<LOD = 97.35	<LOD = 51.15	795.60 ± 130.00	<LOD = 360.00	<LOD = 600.00	817.60 ± 420.00	12800.00 ± 1899.20	13990.40 ± 5897.60	<LOD = 510.00
23		4/30/2002 14:50:01	<LOD = 19.35	40.90 ± 7.90	40.40 ± 9.90	<LOD = 33.00	86.60 ± 41.40	<LOD = 50.40	<LOD = 28.05	267.60 ± 73.90	<LOD = 225.00	<LOD = 390.00	<LOD = 390.00	7596.80 ± 1200.00	<LOD = 5697.60	<LOD = 330.00
24	Shutter Cal 1	4/30/2002 15:02:50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
25		4/30/2002 15:06:52	26.40 ± 15.90	31.80 ± 9.50	46.40 ± 13.20	<LOD = 45.15	666.40 ± 77.90	<LOD = 95.25	<LOD = 50.25	642.80 ± 120.00	<LOD = 360.00	<LOD = 660.00	<LOD = 735.00	19392.00 ± 2299.20	14195.20 ± 7097.60	<LOD = 600.00
26		4/30/2002 15:09:35	47.50 ± 21.50	<LOD = 17.70	65.70 ± 18.90	<LOD = 61.35	1400.00 ± 130.00	<LOD = 150.00	<LOD = 82.20	1460.00 ± 210.00	<LOD = 600.00	<LOD = 990.00	<LOD = 1035.00	27289.60 ± 3299.20	16089.60 ± 9996.80	<LOD = 855.00
27		4/30/2002 15:25:46	54.70 ± 14.00	36.70 ± 8.20	52.50 ± 11.90	<LOD = 39.15	1868.80 ± 94.70	<LOD = 111.45	<LOD = 58.65	2320.00 ± 170.00	603.20 ± 310.00	<LOD = 810.00	<LOD = 885.00	50099.20 ± 2800.00	14297.60 ± 8396.80	<LOD = 705.00
28		4/30/2002 15:32:03	<LOD = 19.05	22.90 ± 7.40	43.10 ± 10.30	45.00 ± 23.40	<LOD = 60.45	<LOD = 46.05	<LOD = 26.10	103.40 ± 61.20	<LOD = 195.00	<LOD = 360.00	<LOD = 390.00	5187.20 ± 1100.00	8038.40 ± 3699.20	<LOD = 315.00
29		4/30/2002 15:37:40	92.80 ± 18.70	19.30 ± 9.60	35.60 ± 14.60	<LOD = 51.90	1969.60 ± 120.00	<LOD = 142.80	<LOD = 71.25	458.00 ± 120.00	<LOD = 360.00	<LOD = 645.00	<LOD = 660.00	12000.00 ± 2000.00	16588.80 ± 6499.20	<LOD = 570.00
30		4/30/2002 15:42:52	11.60 ± 7.50	12.30 ± 4.20	44.00 ± 6.20	52.30 ± 14.30	<LOD = 36.90	<LOD = 27.45	<LOD = 14.10	53.20 ± 33.40	<LOD = 107.10	<LOD = 210.00	<LOD = 195.00	3817.60 ± 580.00	3587.20 ± 1899.20	<LOD = 165.00
31	Shutter Cal 1	5/1/2002 07:43:38	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
32		5/1/2002 08:24:26	<LOD = 130.80	<LOD = 81.90	<LOD = 95.85	<LOD = 270.00	750.40 ± 470.00	<LOD = 630.00	<LOD = 375.00	2440.00 ± 1100.00	<LOD = 3148.80	<LOD = 5400.00	<LOD = 5400.00	40089.60 ± 16998.40	<LOD = 79488.00	<LOD = 4348.80
33		5/1/2002 08:25:37	<LOD = 133.50	<LOD = 75.30	<LOD = 106.20	<LOD = 210.00	1040.00 ± 460.00	<LOD = 585.00	<LOD = 330.00	2009.60 ± 1000.00	<LOD = 3000.00	<LOD = 4948.80	<LOD = 5246.40	26982.40 ± 14988.80	<LOD = 72000.00	<LOD = 4048.80
34		5/1/2002 08:25:44	<LOD = 142.50	<LOD = 79.95	<LOD = 92.40	<LOD = 225.00	1809.60 ± 580.00	<LOD = 660.00	<LOD = 315.00	2899.20 ± 1200.00	<LOD = 3148.80	<LOD = 4800.00	<LOD = 5400.00	46182.40 ± 16998.40	<LOD = 72000.00	<LOD = 4048.80
35		5/1/2002 08:26:02	<LOD = 37.95	43.10 ± 15.90	35.00 ± 21.40	<LOD = 75.60	1189.60 ± 150.00	<LOD = 180.00	<LOD = 100.35	1889.60 ± 300.00	<LOD = 810.00	<LOD = 1364.40	<LOD = 1484.40	31385.60 ± 4598.40	<LOD = 20985.60	<LOD = 1155.00
36		5/1/2002 08:27:15	70.70 ± 28.00	<LOD = 23.25	64.80 ± 27.70	<LOD = 90.15	4649.60 ± 290.00	<LOD = 315.00	189.30 ± 110.00	1889.60 ± 320.00	1460.00 ± 610.00	<LOD = 1470.00	<LOD = 1484.40	34278.40 ± 4598.40	24192.00 ± 13990.40	<LOD = 1200.00
37		5/1/2002 08:29:38	<LOD = 30.75	<LOD = 17.40	73.00 ± 18.30	<LOD = 57.30	1169.60 ± 120.00	<LOD = 144.15	<LOD = 74.70	844.00 ± 170.00	<LOD = 510.00	<LOD = 960.00	<LOD = 1110.00	32486.40 ± 3497.60	23296.00 ± 10995.20	<LOD = 945.00
38		5/1/2002 08:32:12	<LOD = 16.35	<LOD = 9.00	44.70 ± 9.50	41.10 ± 21.30	<LOD = 54.30	<LOD = 41.10	<LOD = 22.05	<LOD = 71.40	<LOD = 150.00	<LOD = 255.00	<LOD = 240.00	1748.80 ± 690.00	<LOD = 3300.00	<LOD = 195.00
39		5/1/2002 08:51:39	<LOD = 21.75	16.10 ± 8.50	54.10 ± 12.70	<LOD = 41.40	410.80 ± 64.20	<LOD = 74.70	<LOD = 38.55	<LOD = 121.50	<LOD = 270.00	<LOD = 495.00	<LOD = 540.00	9344.00 ± 1600.00	<LOD = 7497.60	<LOD = 420.00
40		5/1/2002 08:54:11	<LOD = 30.75	59.10 ± 12.90	51.20 ± 15.60	<LOD = 50.55	177.90 ± 69.50	<LOD = 81.60	<LOD = 45.60	<LOD = 165.00	<LOD = 420.00	<LOD = 1125.00	<LOD = 1470.00	65280.00 ± 4899.20	62668.80 ± 14988.80	<LOD = 1304.40
41		5/1/2002 09:05:16	<LOD = 19.95	27.20 ± 8.10	36.10 ± 11.10	40.00 ± 25.70	678.80 ± 68.80	<LOD = 81.90	<LOD = 42.60	612.40 ± 110.00	<LOD = 300.00	<LOD = 450.00	<LOD = 435.00	7616.00 ± 1300.00	<LOD = 6148.80	<LOD = 360.00
42		5/1/2002 09:07:53	<LOD = 63.00	<LOD = 34.05	<LOD = 53.55	<LOD = 107.85	<LOD = 180.00	<LOD = 150.00	<LOD = 97.35	<LOD = 300.00	<LOD = 570.00	<LOD = 1020.00	<LOD = 1020.00	<LOD = 4648.80	<LOD = 14697.60	<LOD = 840.00
43		5/1/2002 09:08:09	<LOD = 17.40	16.90 ± 6.70	40.30 ± 9.50	37.90 ± 21.40	58.00 ± 38.50	<LOD = 43.05	<LOD = 22.95	113.40 ± 58.30	<LOD = 180.00	<LOD = 330.00	<LOD = 315.00	4288.00 ± 929.60	<LOD = 4348.80	<LOD = 270.00
44		5/1/2002 09:10:46	<LOD = 17.10	<LOD = 9.00	38.60 ± 9.20	54.00 ± 21.50	<LOD = 54.75	<LOD = 40.80	<LOD = 21.75	<LOD = 72.75	<LOD = 165.00	<LOD = 300.00	<LOD = 270.00	3488.00 ± 810.00	<LOD = 3900.00	<LOD = 240.00
45		5/1/2002 09:14:42	<LOD = 25.20	<LOD = 14.55	62.70 ± 14.80	<LOD = 47.55	<LOD = 85.35	<LOD = 65.10	<LOD = 34.80	<LOD = 129.00	<LOD = 330.00	<LOD = 930.00	<LOD = 1215.00	51481.60 ± 4000.00	<LOD = 18000.00	<LOD = 975.00
46		5/1/2002 09:17:17	<LOD = 18.00	<LOD = 10.05	41.40 ± 9.90	<LOD = 32.40	<LOD = 58.50	<LOD = 43.80	<LOD = 23.40	<LOD = 79.20	<LOD = 165.00	<LOD = 285.00	<LOD = 270.00	1748.80 ± 750.00	<LOD = 3448.80	<LOD = 210.00
47		5/1/2002 09:19:57	<LOD = 18.45	10.60 ± 6.90	48.00 ± 10.50	65.50 ± 24.80	172.90 ± 48.00	<LOD = 54.60	<LOD = 28.35	119.60 ± 62.20	<LOD = 195.00	<LOD = 345.00	<LOD = 345.00	5017.60 ± 1000.00	<LOD = 4948.80	<LOD = 285.00
48		5/1/2002 09:22:41	<LOD = 13.05	15.80 ± 5.00	36.10 ± 6.90	25.70 ± 15.40	42.00 ± 27.50	<LOD = 31.80	<LOD = 17.10	<LOD = 58.05	<LOD = 127.80	<LOD = 255.00	<LOD = 270.00	6694.40 ± 829.60	<LOD = 3900.00	<LOD = 225.00
49		5/1/2002 10:04:48	149.70 ± 19.70	34.00 ± 11.00	35.60 ± 19.30	207.00 ± 50.70	6848.00 ± 240.00	<LOD = 240.00	165.20 ± 82.20	1979.20 ± 210.00	1449.60 ± 400.00	<LOD = 795.00	<LOD = 585.00	8486.40 ± 1699.20	9196.80 ± 5299.20	<LOD = 465.00
50		5/1/2002 10:07:30	24.40 ± 9.20	<LOD = 7.20	38.20 ± 7.20	47.80 ± 16.70	<LOD = 43.05	<LOD = 32.55	<LOD = 17.55	<LOD = 59.10	<LOD = 129.45	<LOD = 240.00	<LOD = 240.00	4160.00 ± 710.00	<LOD = 3448.80	<LOD = 210.00
51		5/1/2002 10:13:17	<LOD = 21.90	26.90 ± 8.70	27.10 ± 11.10	45.10 ± 26.20	<LOD = 70.65	<LOD = 55.35	<LOD = 30.60	<LOD = 108.30	<LOD = 240.00	<LOD = 465.00	526.00 ± 340.00	7244.80 ± 1500.00	8544.00 ± 4697.60	<LOD = 405.00
52		5/1/2002 10:16:33	20.10 ± 11.20	10.80 ± 6.00	40.80 ± 8.90	47.60 ± 20.40	<LOD = 52.65	<LOD = 39.45	<LOD = 20.40	<LOD = 68.85	<LOD = 150.00	<LOD = 285.00	<LOD = 285.00	4278.40 ± 860.00	<LOD = 4048.80	<LOD = 240.00
53		5/1/2002 10:25:27	<LOD = 40.20	<LOD = 22.35	55.50 ± 20.80	<LOD = 66.45	157.80 ± 90.50	<LOD = 107.70	<LOD = 60.15	<LOD = 225.00	<LOD = 585.00	<LOD = 1650.00	<LOD = 2250.00	85299.20 ± 7494.40	66969.60 ± 21990.40	<LOD = 1950.00
54		5/1/2002 10:27:57	19.50 ± 10.50	12.80 ± 5.70	36.60 ± 8.20	33.60 ± 18.50	<LOD = 49.05	<LOD = 37.20	<LOD = 20.40	<LOD = 64.95	<LOD = 146.40	<LOD = 270.00	<LOD = 270.00	3987.20 ± 800.00	<LOD = 3900.00	<LOD = 225.00
55		5/1/2002 10:43:22	<LOD = 30.30	29.00 ± 11.50	46.20 ± 15.50	64.40 ± 36.60	121.90 ± 68.60	<LOD = 79.95	<LOD = 40.65	151.00 ± 100.00	<LOD = 330.00	<LOD = 645.00	<LOD = 735.00	11296.00 ± 2200.00	13491.20 ± 7200.00	<LOD = 630.00
56		5/1/2002 10:46:26	<LOD = 12.60	16.30 ± 4.80	46.00 ± 6.90	36.90 ± 15.40	<LOD = 40.35	<LOD = 30.60	<LOD = 16.35	60.30 ± 38.40	<LOD = 128.10	<LOD = 285.00	337.80 ± 220.00	11097.60 ± 980.00	6348.80 ± 3000.00	<LOD = 255.00
57		5/1/2002 10:54:47	<LOD = 23.40	<LOD = 12.15	30.70 ± 11.90	56.50 ± 28.50	<LOD = 74.55	<LOD = 57.30	<LOD = 31.50	<LOD = 102.30	<LOD = 225.00	<LOD = 405.00	<LOD = 360.00	1969.60 ± 1000.00	<LOD = 5097.60	<LOD = 300.00
58	Shutter Cal 1	5/1/2002 12:40:14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
59		5/1/2002 13:13:18	29.60 ± 19.00	25.20 ± 10.60	55.70 ± 14.70	<LOD = 45.00	130.00 ± 60.30	<LOD = 73.05	<LOD = 41.10	163.20 ± 99.30	<LOD = 375.00	<LOD = 1005.00	<LOD = 1274.40	55552.00 ± 4099.20	<LOD = 18000.00	1080.00 ± 650.00
60		5/1/2002 13:16:13	<LOD = 17.40	<LOD = 9.45	42.20 ± 9.70	<LOD = 32.40	<LOD = 56.85	<LOD = 41.70	<LOD = 22.20	<LOD = 72.45	<LOD = 150.00	<LOD = 270.00	<LOD = 240.00	1400.00 ± 680.00	<LOD = 3148.80	<LOD = 195.00
61		5/1/2002 13:18:40	<LOD = 21.75	<LOD = 11.55	50.90 ± 12.40	<LOD = 40.05	752.00 ± 74.40	<LOD = 90.60	<LOD = 45.75	354.80 ± 97.10	<LOD = 300.00	<LOD = 615.00	<LOD = 705.00	19891.20 ± 2099.20	<LOD = 9600.00	<LOD = 525.00
62		5/1/2002 13:21:30	<LOD = 16.95	10.10 ± 6.30	42.60 ± 9.30	<LOD = 30.45	<LOD = 51.75	<LOD = 39.45	<LOD = 21.30	<LOD = 79.95	<LOD = 165.00	<LOD = 330.00	<LOD = 330.00	5680.00 ± 989.60	<LOD = 4648.80	<LOD = 270.00
63		5/1/2002 13:24:48	<LOD = 22.50	21.50 ± 9.00	83.70 ± 14.00	<LOD = 43.95	92.90 ± 52.20	<LOD = 61.65	<LOD = 33.30	221.60 ± 84.70	<LOD = 270.00	<LOD = 555.00	<LOD = 645.00	16000.00 ± 2000.00	<LOD = 9000.00	<LOD = 495.00
64		5/1/2002 13:27:11	<LOD = 13.35	<LOD = 7.50	41.70 ± 7.50	41.70 ± 17.10	<LOD = 42.60	<LOD = 32.85	<LOD = 18.00	<LOD = 59.70	<LOD = 128.40	<LOD = 240.00	<LOD = 225.00	3068.80 ± 660.00	<LOD = 3148.80	<LOD = 180.00
65		5/1/2002 13:40:23	<LOD = 24.75	19.90 ± 10.60	165.00 ± 19.00	<LOD = 55.35	177.90 ± 65.40	<LOD = 77.25	<LOD = 42.15	716.40 ± 130.00	<LOD = 390.00	<LOD = 765.00	<LOD = 900.00	27699.20 ± 2800.00	<LOD = 12144.00	<LOD = 675.00
66		5/1/2002 13:42:48	<LOD = 20.10	19.70 ± 7.70	36.70 ± 10.60	41.30 ± 24.50	<LOD = 66.30	<LOD = 52.35	<LOD = 29.55	<LOD = 96.15	<LOD = 210.00	<LOD = 450.00	591.20 ± 330.00	8646.40 ± 1500.00	<LOD = 6748.80	<LOD = 375.00
67		5/1/2002 14:21:30	<LOD = 20.10	16.20 ± 7.70	62.30 ± 11.80	<LOD = 37.20	136.40 ± 47.40	<LOD = 55.65	<LOD = 30.15	195.20 ± 76.70	<LOD = 240.00	<LOD = 450.00	<LOD = 480.00	9049.60 ± 1400.00	<LOD = 6748.80	<LOD = 375.00
68		5/1/2002 14:23:58	<LOD = 13.80	<LOD = 7.35	39.50 ± 7.30	<LOD = 24.15	<LOD = 42.15	<LOD = 32.10	<LOD = 17.55	<LOD = 59.25	<LOD = 129.30	<LOD = 225.00	<LOD = 210.00	2040.00 ± 580.00	<LOD = 2700.00	<LOD = 165.00
69	Shutter Cal 1	5/3/2002 08:20:02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Serial #X1.700-U976NR3354 Site: Date: 5/20/2002 to 5/21/2002

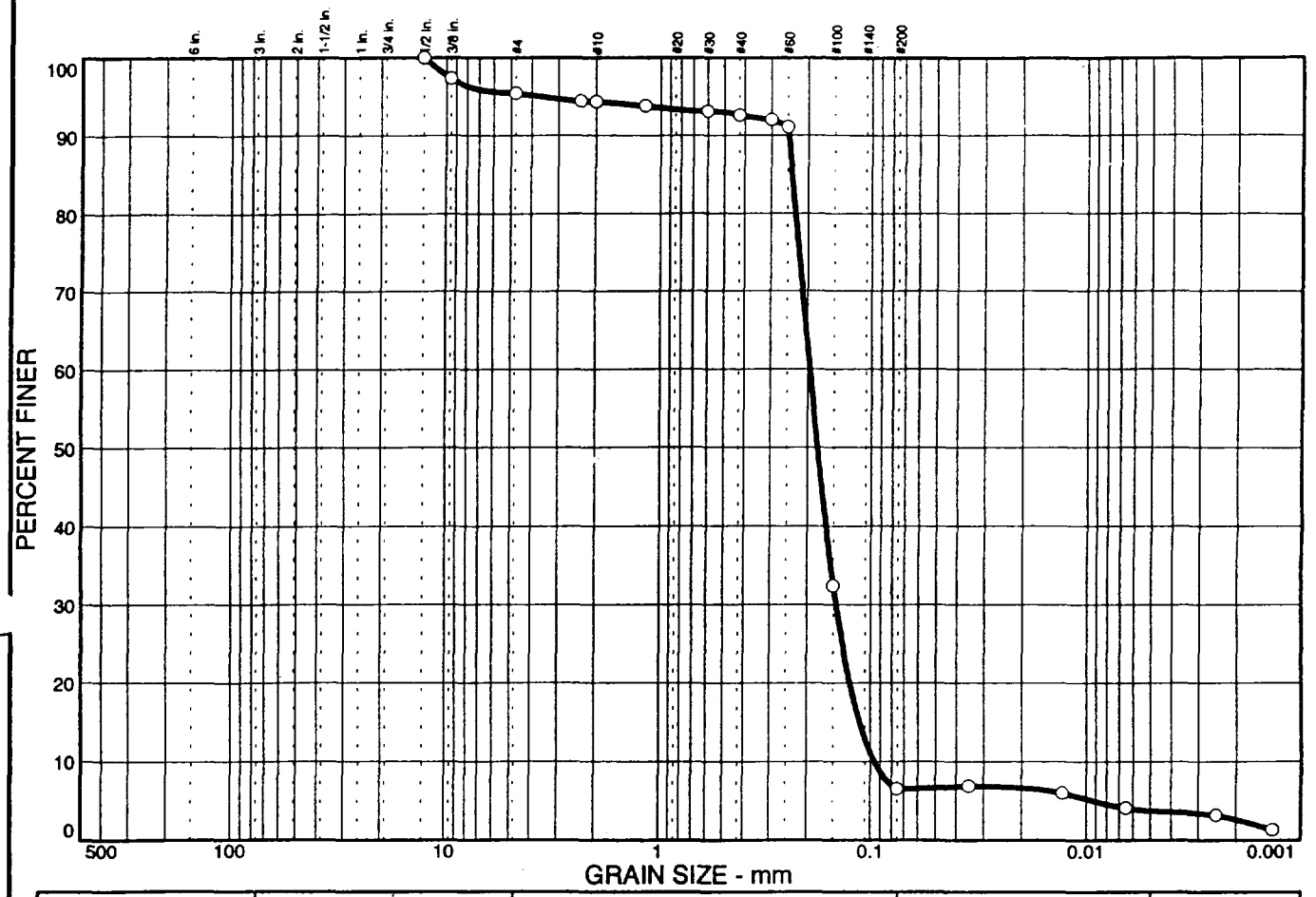
No	Cor1	Date/Time	Mo ± Prec	Zr ± Prec	Sr ± Prec	Rb ± Prec	Pb ± Prec	As ± Prec	Hg ± Prec	Zn ± Prec	Cu ± Prec	Ni ± Prec	Co ± Prec	Fe ± Prec	Mn ± Prec	Cr ± Prec
1	Shutter Cal 1	5/20/2002 07 48 40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2		5/20/2002 07 57 19	<LOD = 54 60	251 00 ± 59 60	121 30 ± 45 10	<LOD = 106 05	<LOD = 180.00	<LOD = 135 60	<LOD = 60 45	<LOD = 315.00	<LOD = 465 00	<LOD = 1230 00	<LOD = 3900 00	61286 40 ± 6694 40	<LOD = 10646 40	<LOD = 3000 00
3		5/20/2002 08 20 53	<LOD = 12 30	<LOD = 13 20	68 20 ± 11 70	44 80 ± 23.90	<LOD = 43 50	<LOD = 30 60	<LOD = 13.65	<LOD = 61 05	<LOD = 104 70	<LOD = 165 00	<LOD = 270 00	1569 60 ± 320 00	<LOD = 720 00	<LOD = 240 00
4		5/20/2002 08 27 10	<LOD = 14 10	<LOD = 13 95	56 70 ± 11.60	37 40 ± 24 00	<LOD = 50 55	<LOD = 38 10	<LOD = 17 85	<LOD = 71 10	<LOD = 119 10	<LOD = 210 00	<LOD = 435 00	4089 60 ± 520 00	<LOD = 1050.00	<LOD = 315 00
5		5/20/2002 08 36 04	<LOD = 13 35	<LOD = 14 40	53 30 ± 11 40	56 40 ± 25 60	<LOD = 51.90	<LOD = 38 40	<LOD = 18 00	<LOD = 67.80	<LOD = 108 60	<LOD = 180 00	<LOD = 345 00	2529 60 ± 410 00	<LOD = 840 00	<LOD = 270 00
6		5/20/2002 08 38 24	<LOD = 12 90	<LOD = 13 65	70 50 ± 12 30	60 50 ± 26 10	<LOD = 41 85	<LOD = 32 25	<LOD = 14 25	<LOD = 61 95	<LOD = 102 75	<LOD = 165 00	<LOD = 270 00	1280 00 ± 310 00	<LOD = 690 00	<LOD = 225 00
7		5/20/2002 08 42 53	<LOD = 12 00	<LOD = 12 75	49 00 ± 10 80	56 00 ± 24 50	85 60 ± 36 70	<LOD = 41 85	<LOD = 18 15	104 50 ± 48 60	<LOD = 110 10	<LOD = 180 00	<LOD = 390 00	3600 00 ± 460 00	<LOD = 900 00	<LOD = 285 00
8		5/20/2002 08 49 43	<LOD = 15 00	<LOD = 15 15	50 70 ± 11 90	59 20 ± 27 10	<LOD = 55 80	<LOD = 42 15	<LOD = 18 00	79 90 ± 52 00	<LOD = 130 20	<LOD = 270 00	<LOD = 690 00	10694 40 ± 849 60	<LOD = 1500 00	<LOD = 405 00
9		5/20/2002 08 52 55	<LOD = 12 75	<LOD = 13 80	62 00 ± 11 40	77 10 ± 26 30	<LOD = 46 35	<LOD = 33 60	<LOD = 16 05	<LOD = 55 80	<LOD = 103 20	<LOD = 180 00	<LOD = 390 00	3667 20 ± 460 00	<LOD = 945 00	<LOD = 285 00
10		5/20/2002 08 55 13	<LOD = 13 95	<LOD = 14 25	72 20 ± 12 80	59 30 ± 27 00	<LOD = 49.80	<LOD = 35 70	<LOD = 16 95	<LOD = 64 35	<LOD = 110 10	<LOD = 180 00	<LOD = 330 00	1979 20 ± 380 00	<LOD = 780 00	<LOD = 270 00
11		5/20/2002 09 10 56	<LOD = 12 00	<LOD = 12 00	44 30 ± 10 00	35 50 ± 21 50	<LOD = 43 20	<LOD = 31 95	<LOD = 13 95	<LOD = 61.65	<LOD = 99 45	<LOD = 165 00	<LOD = 315 00	1720 00 ± 340 00	<LOD = 720 00	<LOD = 240 00
12		5/20/2002 09 14 40	<LOD = 17 40	<LOD = 19.65	90 50 ± 17 80	91 30 ± 38 00	1659 20 ± 130 00	<LOD = 138 90	<LOD = 48 15	924 80 ± 130 00	<LOD = 255 00	<LOD = 360 00	<LOD = 780 00	10496 00 ± 949 60	<LOD = 1950 00	<LOD = 540 00
13		5/20/2002 09 20 37	<LOD = 13 20	<LOD = 14 40	71 00 ± 12 80	39 00 ± 25 20	414 00 ± 56 90	<LOD = 67 65	<LOD = 27 45	592 80 ± 87 10	<LOD = 165 00	<LOD = 240 00	<LOD = 525 00	6707 20 ± 640 00	<LOD = 1260 00	<LOD = 360 00
14		5/20/2002 09 49 03	<LOD = 13 80	<LOD = 14 55	66 00 ± 12.70	<LOD = 37 35	232 60 ± 48 40	<LOD = 56 40	<LOD = 23 70	229 00 ± 65 30	<LOD = 144 00	<LOD = 225 00	<LOD = 450 00	4217 60 ± 540 00	<LOD = 1140 00	<LOD = 345 00
15		5/20/2002 09 53 51	<LOD = 12 15	<LOD = 13 20	55 00 ± 10 90	61 30 ± 24 50	139.30 ± 39.30	<LOD = 46 35	<LOD = 18 90	187.50 ± 55 80	<LOD = 127.35	<LOD = 225 00	<LOD = 540 00	8729 60 ± 680 00	<LOD = 1244 40	<LOD = 345 00
16		5/20/2002 09 56 12	<LOD = 11 85	<LOD = 11 10	38.20 ± 8.90	35 40 ± 19 60	<LOD = 39 90	<LOD = 31 20	<LOD = 14.40	<LOD = 53.85	<LOD = 93 30	<LOD = 165 00	<LOD = 375 00	3817.60 ± 440 00	<LOD = 870 00	<LOD = 255 00
17		5/20/2002 10 07 18	<LOD = 13 35	<LOD = 15 45	67 00 ± 12 60	75 00 ± 28.20	56.80 ± 37.80	<LOD = 41 85	<LOD = 18 60	153 90 ± 55 90	<LOD = 122 55	<LOD = 210 00	<LOD = 495 00	5638 40 ± 600 00	<LOD = 1140 00	<LOD = 330 00
18		5/20/2002 10 10 18	<LOD = 10 80	<LOD = 10 95	43 90 ± 8 60	49 10 ± 19 40	<LOD = 40 50	<LOD = 30 15	<LOD = 14 25	70 20 ± 37 30	<LOD = 93 00	<LOD = 210 00	<LOD = 570 00	13094 40 ± 730 00	<LOD = 1320 00	<LOD = 345 00
19		5/20/2002 10 13 13	<LOD = 13 95	<LOD = 15 75	67 20 ± 13 20	48 60 ± 27 40	<LOD = 55 50	<LOD = 40 05	<LOD = 17 55	<LOD = 74 70	<LOD = 124 05	<LOD = 225 00	<LOD = 465 00	3968 00 ± 540 00	<LOD = 1095 00	<LOD = 360 00
20		5/20/2002 10 21.39	<LOD = 14 10	<LOD = 14 85	44 10 ± 11 50	<LOD = 37.50	140.30 ± 43.60	<LOD = 48 90	<LOD = 22 05	310 80 ± 73.60	<LOD = 150 00	<LOD = 225 00	<LOD = 540 00	5638 40 ± 640 00	<LOD = 1290 00	<LOD = 375 00
21		5/20/2002 10 24 45	<LOD = 19 50	<LOD = 20 10	94 90 ± 19 60	<LOD = 55 20	146 60 ± 60 20	<LOD = 69 30	<LOD = 27 45	<LOD = 112 20	<LOD = 195 00	<LOD = 330 00	<LOD = 705 00	5689 60 ± 829 60	<LOD = 1650 00	<LOD = 525 00
22		5/20/2002 10 26 56	<LOD = 14 10	<LOD = 15 30	75 20 ± 13 40	59 40 ± 28 00	<LOD = 51.00	<LOD = 38 85	<LOD = 18 15	<LOD = 63 75	<LOD = 110 10	<LOD = 180 00	<LOD = 330 00	1988.80 ± 390 00	<LOD = 870 00	<LOD = 300 00
23		5/20/2002 10 32 14	<LOD = 15 75	<LOD = 18 00	79 20 ± 16 70	<LOD = 49 20	361 20 ± 68 80	<LOD = 76 65	<LOD = 26 40	195 00 ± 77 80	<LOD = 180 00	<LOD = 285 00	<LOD = 645 00	6240 00 ± 780 00	<LOD = 1500 00	<LOD = 435 00
24		5/20/2002 10 43 58	<LOD = 11.10	<LOD = 11 70	37 40 ± 9.20	36 10 ± 20.30	78.20 ± 32.20	<LOD = 36 45	<LOD = 17 25	74 70 ± 43 30	<LOD = 107 55	<LOD = 165 00	<LOD = 360 00	3929 60 ± 440 00	<LOD = 870 00	<LOD = 255 00
25		5/20/2002 10 46.44	<LOD = 12 45	<LOD = 12 45	66 90 ± 11 60	87 60 ± 27 00	<LOD = 50 25	<LOD = 36 15	<LOD = 17 85	<LOD = 63 90	<LOD = 102 45	<LOD = 195.00	<LOD = 495 00	6995 20 ± 620 00	<LOD = 1215 00	<LOD = 330 00
26		5/20/2002 10 49 26	<LOD = 12 00	<LOD = 12.75	53 40 ± 10 40	52 30 ± 23 10	<LOD = 46.35	<LOD = 35.25	24 20 ± 13 20	<LOD = 125.55	<LOD = 375 00	14592 00 ± 660 00	<LOD = 720 00	4108 80 ± 510 00	<LOD = 1005 00	479 60 ± 240 00
27		5/20/2002 11:01.21	<LOD = 13 50	<LOD = 15 00	64 90 ± 12 50	59 20 ± 26.90	<LOD = 52 95	<LOD = 38.10	<LOD = 16 50	<LOD = 67 80	<LOD = 113 10	<LOD = 195 00	<LOD = 390 00	3049 60 ± 470 00	<LOD = 1035 00	<LOD = 330 00
28		5/20/2002 11 04 24	<LOD = 12.60	<LOD = 13.05	40 60 ± 10 40	38 50 ± 23.10	<LOD = 49.80	<LOD = 36 30	<LOD = 17 25	<LOD = 68 25	<LOD = 113 10	<LOD = 210 00	<LOD = 510 00	5968 00 ± 610 00	<LOD = 1170 00	<LOD = 345 00
29		5/20/2002 11 06 54	<LOD = 13 35	<LOD = 13 95	54 10 ± 11.70	43.40 ± 25.00	<LOD = 47 40	<LOD = 35 70	<LOD = 16 05	<LOD = 64 50	<LOD = 120 00	<LOD = 180 00	<LOD = 360 00	2619 20 ± 430 00	<LOD = 870 00	<LOD = 270 00
30	Shutter Cal 1	5/20/2002 12 27 28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
31		5/20/2002 12 38.02	<LOD = 14 25	<LOD = 15 60	65 30 ± 13.10	55.80 ± 28.00	<LOD = 51.75	<LOD = 40 35	<LOD = 17.55	<LOD = 70 20	<LOD = 144 15	393 80 ± 180 00	<LOD = 450 00	3468.80 ± 510.00	<LOD = 990 00	<LOD = 330 00
32		5/20/2002 12 41 37	<LOD = 14 10	<LOD = 15.00	68.80 ± 13 60	48 30 ± 28 00	<LOD = 54.75	<LOD = 42 60	<LOD = 19 05	<LOD = 76 50	<LOD = 120 75	<LOD = 225.00	<LOD = 510 00	5107 20 ± 620 00	<LOD = 1215 00	<LOD = 360 00
33		5/20/2002 12:44.07	<LOD = 11.55	<LOD = 10.35	35.70 ± 8.80	<LOD = 28.05	<LOD = 40.05	<LOD = 31 50	<LOD = 14 25	147.90 ± 46.20	<LOD = 99.75	<LOD = 195.00	<LOD = 450 00	5699.20 ± 530.00	<LOD = 1035 00	<LOD = 285 00
34		5/20/2002 13:05:50	<LOD = 14 40	<LOD = 15.90	57 00 ± 12.80	51.20 ± 27.80	82.90 ± 41.60	<LOD = 48.00	<LOD = 20.25	<LOD = 76.80	<LOD = 120.15	<LOD = 270.00	<LOD = 735.00	11296.00 ± 909 60	<LOD = 1650 00	<LOD = 465.00
35		5/20/2002 13:12.26	<LOD = 17.70	<LOD = 17.40	56 10 ± 14 30	<LOD = 44.25	<LOD = 63.15	<LOD = 47.40	<LOD = 21 15	<LOD = 82.50	<LOD = 150.00	<LOD = 270 00	<LOD = 540 00	5027.20 ± 680.00	<LOD = 1394.40	<LOD = 435.00
36		5/20/2002 13:17:06	<LOD = 15.45	<LOD = 16.20	70.40 ± 14.20	<LOD = 40 20	<LOD = 50.55	<LOD = 39.60	<LOD = 19.80	<LOD = 81 90	<LOD = 129 75	<LOD = 225.00	<LOD = 480.00	3539.20 ± 550.00	<LOD = 1140.00	<LOD = 360 00
37		5/20/2002 13:27.44	<LOD = 20.10	<LOD = 21.75	74.70 ± 18.40	<LOD = 52.95	<LOD = 79.65	<LOD = 55 20	<LOD = 24 00	<LOD = 87.15	<LOD = 165.00	<LOD = 270 00	<LOD = 555 00	3840.00 ± 700.00	<LOD = 1454 40	<LOD = 465 00
38		5/20/2002 13:54:20	<LOD = 16 65	<LOD = 18.30	53.80 ± 14.40	59.20 ± 32.10	749.20 ± 85.70	<LOD = 91.50	<LOD = 31.35	682.40 ± 110.00	<LOD = 225 00	<LOD = 405.00	<LOD = 1035.00	20390.40 ± 1300 00	<LOD = 2400 00	<LOD = 630.00
39		5/20/2002 13:56.42	<LOD = 19.50	39.80 ± 16.80	142.80 ± 22.10	104.60 ± 44.10	243.40 ± 69.20	<LOD = 82 80	<LOD = 37 80	1140 00 ± 150.00	<LOD = 300.00	<LOD = 570 00	<LOD = 1650.00	45491.20 ± 2499.20	<LOD = 3748.80	<LOD = 945 00
40		5/20/2002 14 01.52	<LOD = 15 15	<LOD = 15.75	48 80 ± 11.90	64 60 ± 27 90	<LOD = 54.60	75.40 ± 32 00	<LOD = 21.75	221 40 ± 68 70	<LOD = 165 00	<LOD = 360.00	<LOD = 975 00	22988 80 ± 1300 00	<LOD = 2250 00	<LOD = 600 00
41		5/20/2002 14 04.21	<LOD = 15.30	<LOD = 17 70	47.40 ± 12.50	<LOD = 40.65	70.70 ± 41.90	<LOD = 48 00	<LOD = 21 60	243.60 ± 73 80	<LOD = 180 00	<LOD = 480 00	<LOD = 1410 00	44288 00 ± 2099 20	<LOD = 3300.00	<LOD = 825 00
42		5/20/2002 14 19 29	<LOD = 13.50	<LOD = 13.20	70.40 ± 12.40	60 20 ± 26 40	95 10 ± 38.80	<LOD = 44 10	<LOD = 18 30	156 20 ± 55 40	<LOD = 125 85	<LOD = 225 00	<LOD = 540 00	7385 60 ± 660 00	<LOD = 1215.00	<LOD = 360.00
43		5/20/2002 14 22 08	<LOD = 12.15	<LOD = 12 45	58 80 ± 10 80	49.90 ± 23.10	51 20 ± 32 20	<LOD = 33 90	<LOD = 14 10	<LOD = 62 55	<LOD = 100 35	<LOD = 180 00	<LOD = 420 00	4547 20 ± 500 00	<LOD = 990 00	<LOD = 285 00
44		5/20/2002 14 24 32	<LOD = 13 65	<LOD = 14 55	63.80 ± 12 50	40 10 ± 25 40	<LOD = 46 95	<LOD = 36 60	<LOD = 17.40	<LOD = 61 95	<LOD = 115 35	<LOD = 195 00	<LOD = 375 00	2529 60 ± 430 00	<LOD = 840 00	<LOD = 270 00
45	Shutter Cal 1	5/21/2002 07 16 19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
46	Shutter Cal 1	5/21/2002 07 29 32	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
47		5/21/2002 07 36 11	<LOD = 19 35	<LOD = 22 20	101 40 ± 19 30	<LOD = 51.45	134 10 ± 56.20	<LOD = 64 05	<LOD = 27 15	203 60 ± 86 50	<LOD = 210.00	<LOD = 435 00	<LOD = 1170 00	21094 40 ± 1600 00	<LOD = 2848 80	<LOD = 750 00
48		5/21/2002 07 38 54	<LOD = 14 55	48 30 ± 12 70	60 80 ± 12.50	77 10 ± 29 00	103.40 ± 42 80	<LOD = 49 65	<LOD = 21 60	223.40 ± 66 10	<LOD = 150 00	<LOD = 315 00	<LOD = 840 00	17292 80 ± 1100 00	<LOD = 1950 00	<LOD = 510 00
49		5/21/2002 07 42 53	<LOD = 18 75	<LOD = 19.95	67 30 ± 17.30	<LOD = 48 60	180 70 ± 61 80	<LOD = 70 80	<LOD = 38 55	4188 80 ± 310 00	<LOD = 480 00	<LOD = 750 00	<LOD = 2100 00	72857 60 ± 3600 00	<LOD = 4948.80	<LOD = 1230 00
50		5/21/2002 07.45.46	<LOD = 15 45	<LOD = 16 50	67 20 ± 13 50	54.60 ± 28 60	<LOD = 56 10	<LOD = 39 90	<LOD = 17 85	<LOD = 73 50	<LOD = 131 55	<LOD = 210 00	<LOD = 465 00	3408 00 ± 520 00	<LOD = 1080 00	<LOD = 345 00
51		5/21/2002 08 28 00	<LOD = 16 95	<LOD = 18.75	76.10 ± 15 60	<LOD = 44 40	80 20 ± 45 60	<LOD = 54 15	<LOD = 25 05	121 40 ± 70 30	<LOD = 180 00	<LOD = 345 00	<LOD = 855 00	13299 20 ± 1100 00	<LOD = 1950 00	<LOD = 540 00
52		5/21/2002 08 31.02	<LOD = 16 50	<LOD = 18 30	108 90 ± 16 70	75 90 ± 33.80	150.80 ± 51.60	<LOD = 57 45	<LOD = 25 20	142.70 ± 70 10	<LOD = 195 00	<LOD = 615 00	<LOD = 1950 00	83456.00 ± 3200 00	<LOD = 4348 80	<LOD = 1080 00
53		5/21/2002 08 34 29	<LOD = 14 70	<LOD = 17 70	105 50 ± 15 80	54 30 ± 29 90	68 00 ± 40 90	<LOD = 47 10	<LOD = 20.40	180 10 ± 63 80	<LOD = 143 85	<LOD = 285 00	<LOD = 750 00	12998 40 ± 969 60	<LOD = 1800 00	<LOD = 465 00
54	Shutter Cal 1	5/21/2002 12 50 02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
55		5/21/2002 12 51 45	<LOD = 18 15	22 10 ± 14 10	93 00 ± 17 80	<LOD = 50 70	793 20 ± 91 90	<LOD = 104 40	<LOD = 39 45	438 00 ± 98 80	<LOD = 210 00	<LOD = 390 00	<LOD = 990 00	16000 00 ± 1200 00	<LOD = 2400 00	<LOD = 615 00
56		5/21/2002 12 54 31	<LOD = 30.30	<LOD = 38 40	192 40 ± 36 00	<LOD = 83.10	<LOD = 122 70	<LOD = 92 55	<LOD = 42 30	<LOD = 180 00	<LOD = 270 00	<LOD = 390 00	<LOD = 735 00	1469 60 ± 750 00	<LOD = 1800 00	<LOD = 675 00
57		5/21/2002 12.56.49	43 00 ± 16 60	<LOD = 26 25	135 80 ± 26.90	118 90 ± 55 10	4288 00 ± 260 00	<LOD = 255 00	<LOD = 88 05	2179.20 ± 240 00	1280 00 ± 330 00	<LOD = 585 00	<LOD = 1095 00	16793 60 ± 1400 00	<LOD = 2700 00	<LOD = 780 00
58		5/21/2002 12 59 28	<LOD = 15.15	20 80 ± 11 60	62 00 ± 12.80	47 10 ± 27 00	<LOD = 48 30	<LOD = 38 55	<LOD = 18 60	<LOD = 66 75	<LOD = 121 80	<LOD = 225 00	<LOD = 420 00	3478 40 ± 500 00	<LOD = 990 00	<LOD = 300 00
59		5/21/2002 13 25 54	<LOD = 17 70	<LOD = 19 65	69 20 ± 15 70	56 80 ± 33 30	660 80 ± 83 30	<LOD = 93 60	<LOD = 34 50	661 20 ± 110 00	<LOD = 225 00	<LOD = 315 00	<LOD = 750 00	9619 20 ± 909 60	<LOD = 1650 00	<LOD = 480 00
60		5/21/2002 13 28 20	40 80 ± 17 10	45 50 ± 20 50	125 70 ± 29 60	121 00 ± 61 20	8057 60 ± 400 00	<LOD = 345 00	<LOD = 114 75	4089 60 ± 330 00	1129 60 ± 380 00	<LOD = 660 00	<LOD = 1424 40	27776 00 ± 1899 20	<LOD = 3300 00	1440 00 ± 640 00
61		5/21/2002 13 30 57	<LOD = 17 85	<LOD = 19 20	71 30 ± 15 30	<LOD = 46.20	<LOD = 60 30	<LOD = 43 65	<LOD = 23 25	<LOD = 116 55	<LOD = 285 00	4000 00 ± 450 00	<LOD = 750 00	6307 20 ± 770 00	<LOD = 1500 00	<LOD = 450 00
62		5/21/2002 13 35 59	<LOD = 15 60	<LOD = 17 70	72 00 ± 14 10	43 70 ± 28 30	<LOD = 57 60	<LOD = 43 05	<LOD = 18 75	<LOD = 75 15	<LOD = 122 70	<LOD = 225 00	<LOD = 495 00	4387 20 ± 580 00	<LOD = 1110 00	<LOD = 330 00
63		5/21/2002 13 38 36	<LOD = 14 25	<LOD = 14 70	49 40 ± 11 60	<LOD = 37 05	<LOD = 48 30	<LOD = 37 35	<LOD = 17 40	<LOD = 59 55	<LOD = 119 55	<LOD = 195 00	<LOD = 405 00	3080 00 ± 470 00	<LOD = 945 00	<LOD = 285 00
64		5/21/2002 13.41 09	<LOD = 16 95	<LOD = 18 60	72 80 ± 15 00	54 50 ± 31 30	<LOD = 56 70	<LOD = 42 90	<LOD = 18 45	<LOD = 75 60	<LOD = 140 10	<LOD = 240 00	<LOD = 465 00	3587 20 ± 560 00	<LOD = 1095 00	<LOD = 330 00
65		5/21/2002 14 02 58	<LOD = 15 15	<LOD = 18 30	65 40 ± 14 60	62 40 ± 31 40	795 20 ± 84 30	<LOD = 94 95	<LOD = 33 75	616 40 ± 100 00	<LOD = 210 00	<LOD = 315 00	<LOD = 750 00	12499 20 ± 969 60	<LOD = 1650 00	637 20 ± 330 00
66		5/21/2002 14 05 28	<LOD = 32.40	96 60 ± 26 70	80 10 ± 26 10	<LOD = 80.70	1429 60 ± 170 00	<LOD = 195 00	<LOD = 75 60	560 80 ± 170 00	<LOD = 390 00	<LOD = 825 00	<LOD = 2400 00	58163 20 ± 3897 60	<LOD = 5697 60	<LOD = 1500 00
67		5/21/2002 14.08 19	<LOD = 23 70	95 00 ± 20 60	97 10 ± 20 40	<LOD = 58.50	601 60 ± 92 90	<LOD = 105 75	<LOD = 40 35	335 40 ± 110 00	<LOD = 240 00	<LOD = 525 00	<LOD = 1410 00	29184 00 ± 2000 00	<LOD = 3300 00	<LOD = 870 00
68		5/21/2002 14 10 26	<LOD = 13.35	<LOD = 15 45	69 40 ± 13 30	56 10 ± 28 00	<LOD = 55 20	<LOD = 40 35	<LOD = 19 65	<LOD = 64 05	<LOD = 116 10	<LOD = 210 00	<LOD = 375 00	2539 20 ± 440 00	<LOD = 945 00	<LOD = 300 00
69		5/21/2002 14 17 04	43 30 ± 18 60	37 50 ± 20 10	134 30 ± 27 10	<LOD = 76.05	2560 00 ± 200 00	<LOD = 210 00	<LOD = 75 60	2800 00 ± 280 00	<LOD = 480 00	<LOD = 705 00	<LOD = 1800 00	39884 80 ± 2600 00	<LOD = 4200 00	<LOD = 1095 00
70		5/21/2002 14 19 27	37 30 ± 14 50	<LOD = 21.30	148 00 ± 23.20	<LOD = 58 80	1840 00 ± 150 00	<LOD = 150 00	<LOD = 50 70	927 20 ± 140 00	<LOD = 270 00	<LOD = 345 00	<LOD = 765 00	7936 00 ± 900 00	<LOD = 1650 00	<LOD = 510 00
71		5/21/2002 14.21.51	<LOD = 30 45	<LOD = 37 35	114 20 ± 35 40	<LOD = 94 50	7974 40 ± 490 00	<LOD = 420 00	<LOD = 165.00	30592 00 ± 1600 00	<LOD = 1454 40	<LOD = 1155 00	<LOD = 2250 00	40883 20 ± 3099 20	<LOD = 4948 80	<LOD = 1440 00
72		5/21/2002 14 30 30	<LOD = 18 75	<LOD = 20 70	82 20 ± 18 30	<LOD = 54 90	1960 00 ± 140 00	<LOD = 150 00	<LOD = 52 80	1689 60 ± 180 00	<LOD = 330 00	<LOD = 480 00	<LOD = 1155 00	24691 20 ± 1600 00	<LOD = 2700 00	<LOD = 765 00
73		5/21/2002 14 32 54	310 20 ± 31 80	<LOD = 26 25	78 10 ± 23 00	<LOD = 69 75	2689 60 ± 210 00	<LOD = 210 00	<LOD = 73 65	1260 00 ± 200 00	969 60 ± 300 00	<LOD = 810 00	<LOD = 2250 00	69888 00 ± 3699 20	<LOD = 5246 40	<LOD = 1320 00
74		5/21/2002 14 35 14	<LOD = 13 65	<LOD = 15 15	74 50 ± 13 10	53 40 ± 27 00	<LOD = 51 45	<LOD = 35 85	<LOD = 16 80	<LOD = 70 05	<LOD = 118 05	<LOD = 195 00	<LOD = 420 00	4048 00 ± 510 00	<LOD = 1005 00	<LOD = 300 00
75		5/21/2002 14 37 49	<LOD = 14 10	<LOD = 15 30	78 90 ± 14 10	45 30 ± 27 90	<LOD = 51 75	<LOD = 39 30	<LOD = 18 15	<LOD = 71 85	<LOD = 125 85	<LOD = 210 00	<LOD = 450 00	3099 20 ± 490 00	<LOD = 930 00	<LOD = 300 00
76		5/21/2002 14 42 14	<LOD = 19 95	48 00 ± 16 20	72 50 ± 18 00	<LOD = 53 25	1840 00 ± 140 00	<LOD = 150 00	<LOD = 54 00	1329 60 ± 160 00	388.60 ± 220 00	<LOD = 585 00	<LOD = 1650 00	42777 60 ± 2299 20	<LOD = 3600 00	<LOD = 960 00
77		5/21/2002 14 44 39	<LOD = 25 65	213 40 ± 28 70	110 90 ± 22 50	67 10 ± 44 4[illegible]	[illegible] 80 ± 78 80	<LOD = 93 15	<LOD = 36 15	366 00 ± 120 00	<LOD = 270 00	<LOD = 615 00	<LOD = 1800 00	38579 20 ± 2499 20	<LOD = 3900 00	<LOD = 1005 00
78		5/21/2002 14 47 11	<LOD = 14 25	<LOD = 16 05	47 40 ± 12 30	<LOD = 39 [illegible]	[illegible] ± 58 65	<LOD = 46 80	<LOD = 21 90	174 60 ± 66 50	<LOD = 165 00	<LOD = 360 00	<LOD = 1065 00	24192 00 ± 1400 00	<LOD = 2400 00	<LOD = 630 00
79		5/21/2002 14.52.03	<LOD = 18 45	27 70 ± 14 00	72 90 ± 16 40	<LOD = 45 [illegible]	[illegible] ± 98 40	<LOD = 112 35	<LOD = 41 55	687 20 ± 120 00	<LOD = 240 00	<LOD = 390 00	<LOD = 975 00	16896 00 ± 1300 00	<LOD = 2250 00	<LOD = 645 00
80		5/21/2002 14 54 21	<LOD = 13.80	<LOD = 15.00	73 20 ± 13 50	52 [illegible] ± 27 9[illegible]	[illegible] 52 20	<LOD = 40 05	<LOD = 19 20	<LOD = 73 05	<LOD = 148 65	570 80 ± 200 00	<LOD = 495 00	4019 20 ± 550 00	<LOD = 1125 00	<LOD = 345 00
81		5/21/2002 14 57 12	<LOD = 14 70	<LOD = 16 80	67 40 ± 14 10	55 20 ± 29 [illegible]	[illegible] 53.40	<LOD = 39 00	<LOD = 18 00	<LOD = 67 80	<LOD = 128 25	<LOD = 210 00	<LOD = 420 00	2979 20 ± 500 00	<LOD = 990 00	<LOD = 315.00
82		5/21/2002 15:00 55	53 80 ± 28.40	47.80 ± 29 80	57 60 ± 33.60	<LOD = 118 [illegible]	[illegible] 340 00	<LOD = 345 00	<LOD = 119 10	3059 20 ± 440 00	<LOD = 795 00	<LOD = 1065 00	<LOD = 2700 00	37683.20 ± 3798 40	<LOD = 6148 80	<LOD = 1650 00
83		5/21/2002 15.03 44	<LOD = 55 20	<LOD = 54 90	<LOD = 55.20	<LOD = 147 [illegible]	[illegible] 450 00	<LOD = 480 00	<LOD = 165 00	1209 60 ± 430 00	<LOD = 765 00	<LOD = 1065 00	<LOD = 2548 80	8825 60 ± 2699 20	<LOD = 5400 00	<LOD = 1650 00
84		5/21/2002 15 04 21	<LOD = 73 35	<LOD = 74 25	<LOD = 90.60	<LOD = 186 [illegible]	[illegible] ± 460.00	<LOD = 495 00	<LOD = 180 00	1668.80 ± 640 00	<LOD = 1215 00	<LOD = 1500 00	<LOD = 3900 00	25190 40 ± 5600 00	<LOD = 8846 40	<LOD = 2548 80

No	Cor1	Date/Time	Mo ± Prec	Zr ± Prec	Sr ± Prec	Rb ± Prec	Pb ± Prec	As ± Prec	Hg ± Prec	Zn ± Prec	Cu ± Prec	Ni ± Prec	Co ± Prec	Fe ± Prec	Mn ± Prec	Cr ± Prec
85	Shutter Cal 1	5/21/2002 15:15:51	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
86		5/21/2002 15:15:54	<LOD = 14.40	<LOD = 16.35	86.50 ± 14.80	46.00 ± 28.70	179.70 ± 48.50	<LOD = 55.05	<LOD = 21.00	349.60 ± 77.80	<LOD = 165.00	<LOD = 285.00	<LOD = 705.00	10899.20 ± 889.60	<LOD = 1650.00	<LOD = 480.00
87		5/21/2002 15:18:19	<LOD = 16.20	<LOD = 18.45	125.10 ± 19.40	<LOD = 51.00	302.40 ± 64.40	<LOD = 78.30	<LOD = 32.85	400.80 ± 95.10	<LOD = 195.00	<LOD = 375.00	<LOD = 1020.00	18598.40 ± 1300.00	<LOD = 2400.00	696.00 ± 460.00
88		5/21/2002 15:20:38	<LOD = 17.40	33.20 ± 15.50	161.50 ± 21.60	<LOD = 51.90	269.00 ± 62.20	<LOD = 73.95	<LOD = 30.45	481.20 ± 100.00	<LOD = 210.00	<LOD = 390.00	<LOD = 1050.00	19699.20 ± 1400.00	<LOD = 2548.80	<LOD = 705.00

APPENDIX C

ANALYTICAL DATA

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.6	88.9	2.7	3.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	97.3		
#4	95.4		
#8	94.4		
#10	94.3		
#16	93.8		
#30	93.1		
#40	92.6		
#50	92.0		
#60	91.1		
#100	32.4		
#200	6.5		

* (no specification provided)

Soil Description

Brown Fine to Coarse SAND & GRAVEL, Trace Silt

Atterberg Limits

PL= --- LL= --- PI= ---

Coefficients

D_{85}= 0.238 D_{60}= 0.195 D_{50}= 0.179
D_{30}= 0.146 D_{15}= 0.113 D_{10}= 0.0960
C_u= 2.04 C_c= 1.13

Classification

USCS= SP-SM AASHTO= A-3

Remarks

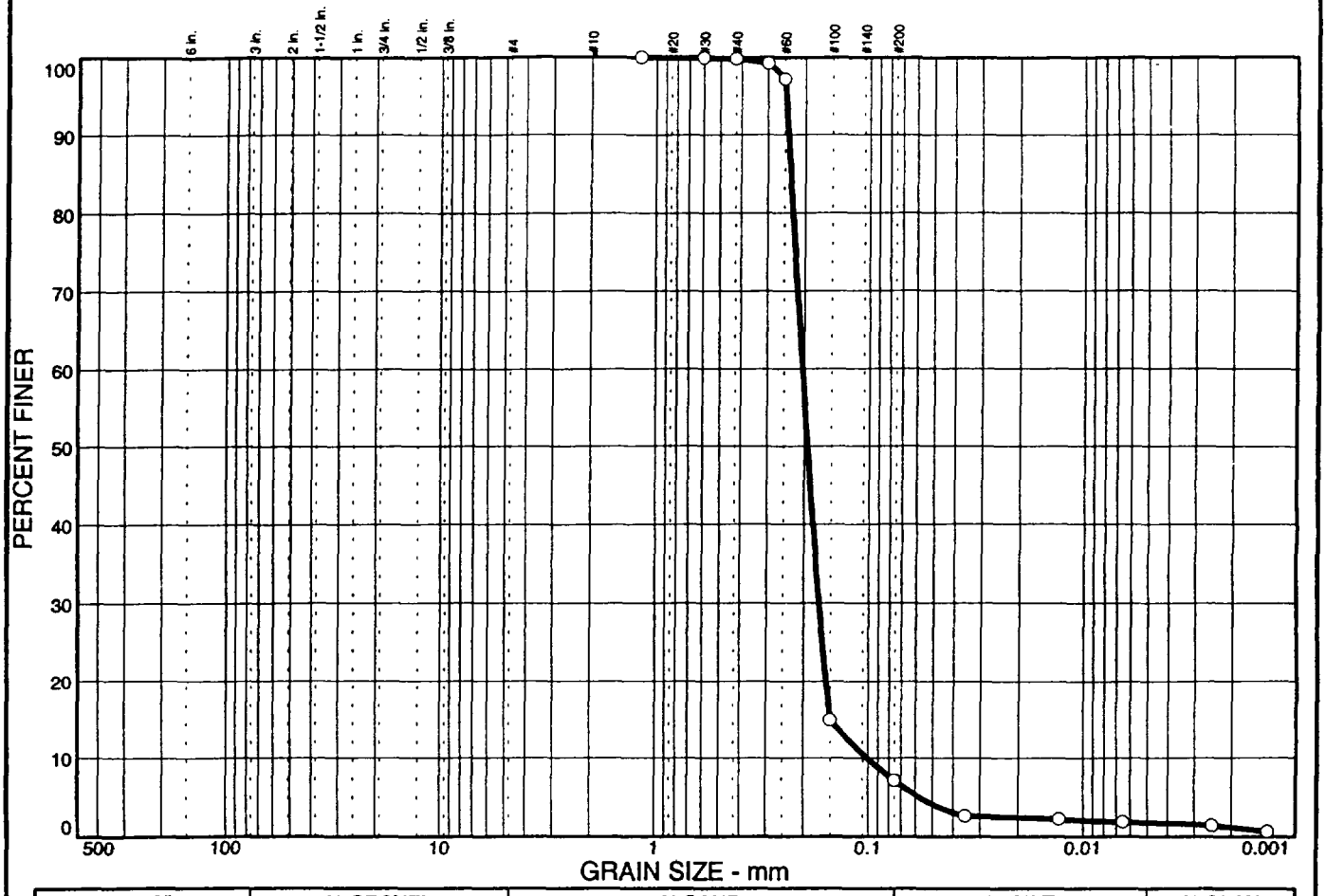
Tests by: D. Arenander
Checked by: M. Schultz

Sample No.: 3" ST: 1 to 10 ft **Source of Sample:** Shelby Tube **Date:** 6/5/02
Location: --- **Elev./Depth:** ---

CGC, Inc.

Client: Roy F. Weston
Project: Calumet Container
Job #0222
Project No: C02038-4 **Plate**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	92.9	5.4	1.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	99.9		
#40	99.8		
#50	99.2		
#60	97.2		
#100	14.9		
#200	7.1		

* (no specification provided)

Soil Description

Brown Fine SAND, Little Silt, Trace Clay

Atterberg Limits

PL= --- LL= --- PI= ---

Coefficients

D_{85}= 0.234 D_{60}= 0.205 D_{50}= 0.194
D_{30}= 0.170 D_{15}= 0.150 D_{10}= 0.101
C_u= 2.03 C_c= 1.40

Classification

USCS= SP-SM AASHTO= A-3

Remarks

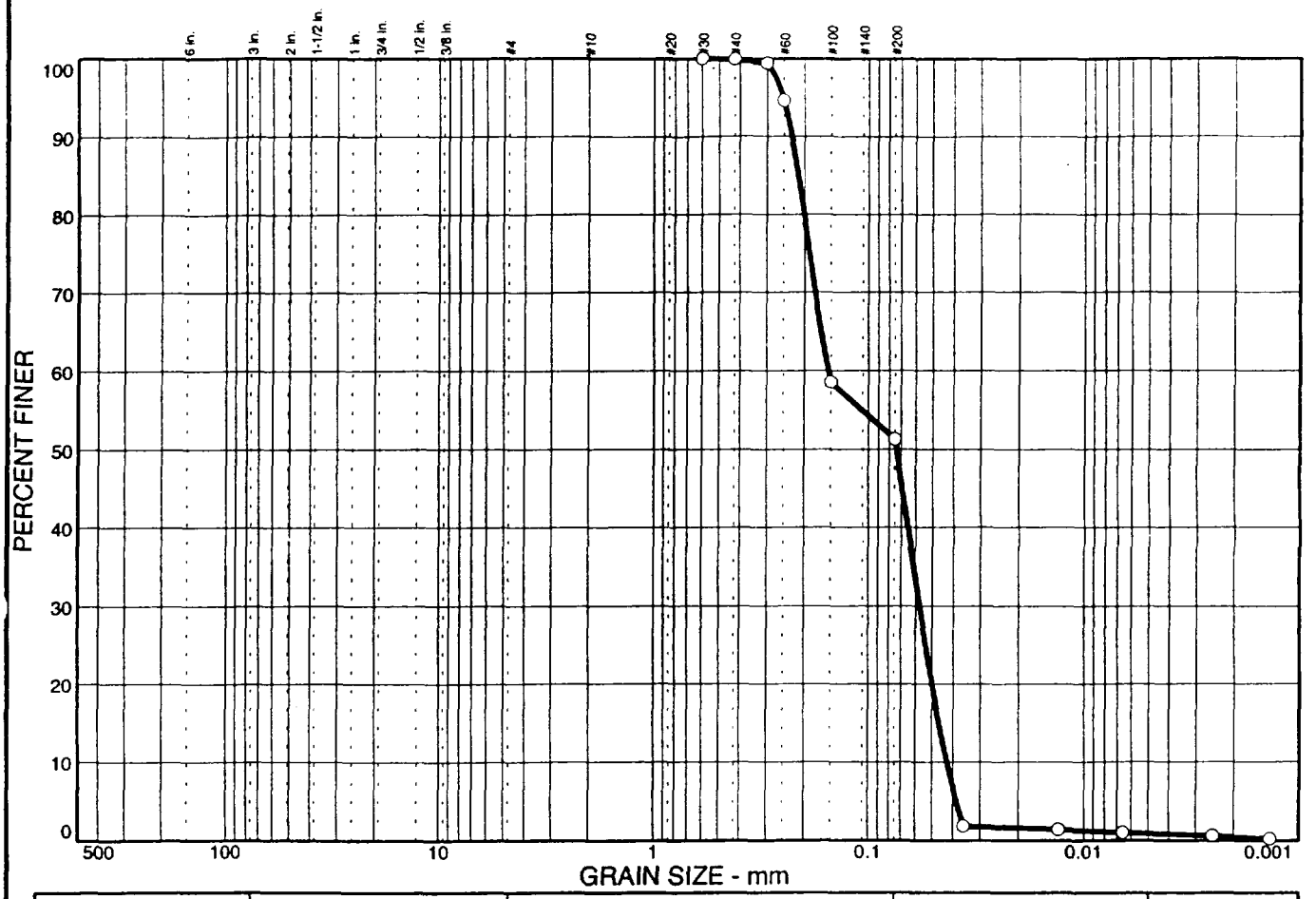
Tests by: D. Arenander
Checked by: M. Schultz

Sample No.: 3" ST: 1 to 8 ft **Source of Sample:** Shelby Tube **Date:** 6/5/02
Location: --- **Elev./Depth:** ---

CGC, Inc.

Client: Roy F. Weston
Project: Calumet Container
Job #0222
Project No: C02038-4 **Plate**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	48.7	50.4	0.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#30	100.0		
#40	99.9		
#50	99.4		
#60	94.6		
#100	58.5		
#200	51.3		

* (no specification provided)

Soil Description

Brown Fine SAND, Little Silt, Trace Clay

Atterberg Limits

PL= --- LL= --- PI= ---

Coefficients

D_{85}= 0.214 D_{60}= 0.154 D_{50}= 0.0738
D_{30}= 0.0575 D_{15}= 0.0464 D_{10}= 0.0426
C_u= 3.62 C_c= 0.50

Classification

USCS= ML AASHTO= A-4(0)

Remarks

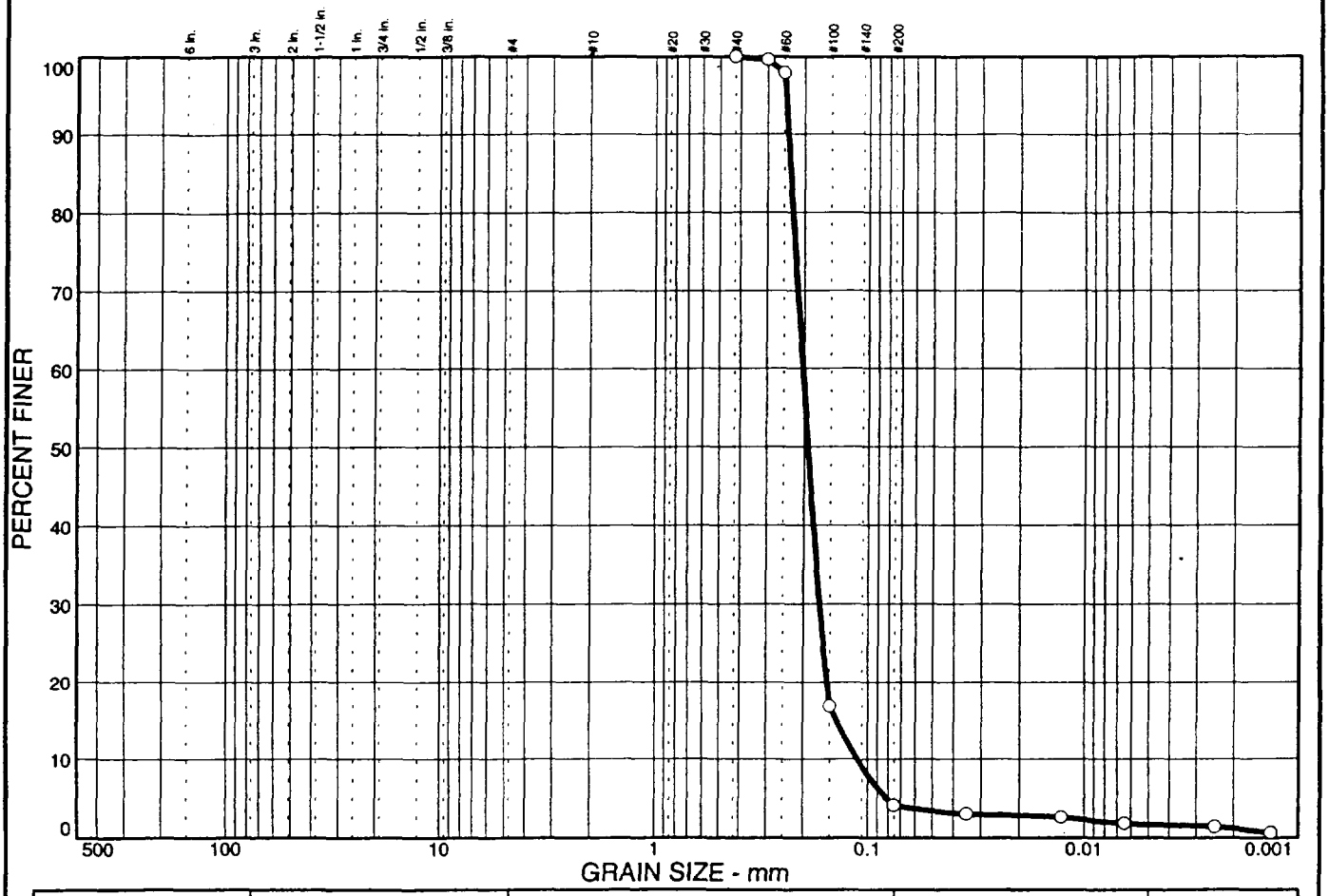
Tests by: D. Arenander
Checked by: M. Schultz

Sample No.: 3" ST: 1 to 6 ft **Source of Sample:** Shelby Tube **Date:** 6/5/02
Location: --- **Elev./Depth:** ---

CGC, Inc.

Client: Roy F. Weston
Project: Calumet Container
Job #0222
Project No: C02038-4 **Plate**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	95.9	2.5	1.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#40	100.0		
#50	99.6		
#60	97.9		
#100	16.8		
#200	4.1		

* (no specification provided)

Soil Description

Brown Fine SAND, Trace Silt

Atterberg Limits

PL= --- LL= --- PI= ---

Coefficients

D_{85}= 0.234 D_{60}= 0.204 D_{50}= 0.192
D_{30}= 0.168 D_{15}= 0.140 D_{10}= 0.111
C_u= 1.83 C_c= 1.24

Classification

USCS= SP AASHTO= A-3

Remarks

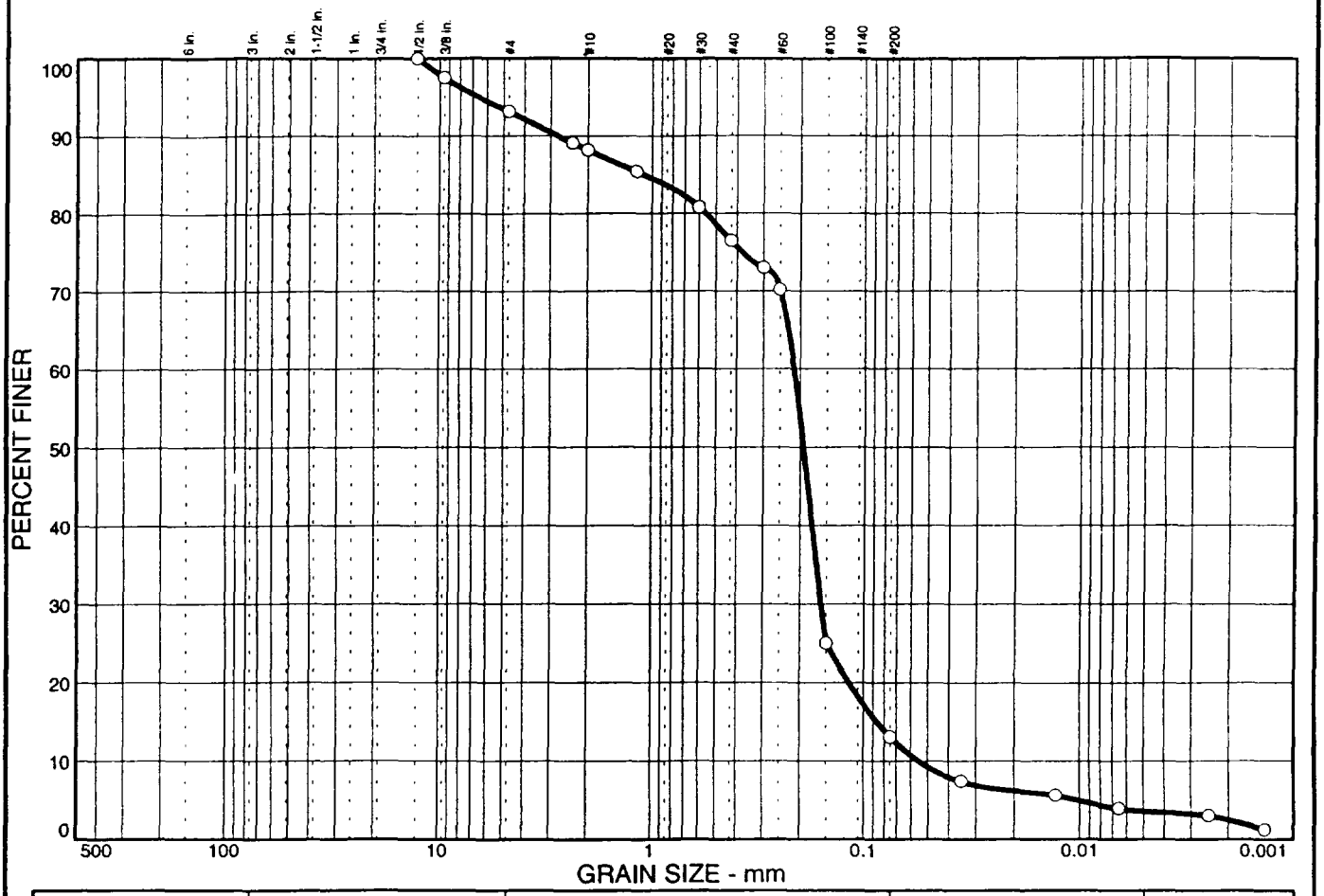
Tests by: D. Arenander
Checked by: M. Schultz

Sample No.: 3" ST: 1 to 5 ft **Source of Sample:** Shelby Tube **Date:** 6/5/02
Location: --- **Elev./Depth:** ---

CGC, Inc.

Client: Roy F. Weston
Project: Calumet Container
Job #0222
Project No: C02038-4 **Plate**

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL	% SAND	% SILT	% CLAY
0.0	6.9	80.0	9.5	3.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2 in.	100.0		
3/8 in.	97.5		
#4	93.1		
#8	89.1		
#10	88.2		
#16	85.4		
#30	80.8		
#40	76.5		
#50	73.0		
#60	70.2		
#100	25.0		
#200	13.1		

* (no specification provided)

Soil Description

Brown Fine to Coarse SAND, Little Silt & Gravel, Trace Clay

Atterberg Limits

PL= --- LL= --- PI= ---

Coefficients

D_{85}= 1.09 D_{60}= 0.215 D_{50}= 0.194
D_{30}= 0.159 D_{15}= 0.0863 D_{10}= 0.0549
C_u= 3.91 C_c= 2.15

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Tests by: D. Arenander
Checked by: M. Schultz

Sample No.: 3" ST: 1.5 to 3.5 ft **Source of Sample:** Shelby Tube **Date:** 6/5/02
Location: --- **Elev./Depth:** ---

CGC, Inc.

Client: Roy F. Weston
Project: Calumet Container
Job #0222
Project No: C02038-4 **Plate**

APPENDIX D

GEOTECH SAMPLE DATA RESULTS

Roy F Weston, Inc.
750 E Bunker Ct, Suite 500
Vernon Hills, IL 60061
Tel: (847) 918-4041
Fax: (847) 918-4055

ACE Technologies Inc.
1680 Lake Front Circle, Ste. B
The Woodlands, TX 78130
Phone: (281) 363-2233
Fax : (281) 298-5784

Date: 5/16/02

Attn: Mr. Rick Mehl / Ms.Tonya Balla

VOLATILES

Project Name: Calumet Container

Episode #:		7827				
Lab Sample ID		1	2	3	4	8
Client Sample I D		CC (2-4)	CC (3-5)	CC (5-7)	CC (1-7)	Trip Blank
		Soil	Soil	Soil	Soil	Water
						ug/l
Date Sampled		5/1/02	5/1/02	5/1/02	5/1/02	5/1/02
Time Sampled		9:20	9:57	11:00	11:35	
	Units					
VOA 8260B						
1,1,1,2-Tetrachloroethane	ug/kg	<410	<16	<16	<15	<1.0
1,1,1-Trichloroethane	ug/kg	<410	<16	<16	<15	<1.0
1,1,2,2-Tetrachloroethane	ug/kg	<410	<16	<16	<15	<1.0
1,1,2-Trichloroethane	ug/kg	<410	<16	<16	<15	<1.0
1,1-Dichloroethane	ug/kg	<410	<16	<16	<15	<1.0
1,1-Dichloroethene	ug/kg	<410	<16	<16	<15	<1.0
1,1-Dichloropropene	ug/kg	<410	<16	<16	<15	<1.0
1,2,3-Trichlorobenzene	ug/kg	<410	<16	<16	<15	<1.0
1,2,3-Trichloropropane	ug/kg	<410	<16	<16	<15	<1.0
1,2,4-Trichlorobenzene	ug/kg	8000 J	<16 J	<16 J	20 J	<1.0 J
1,2,4-Trimethylbenzene	ug/kg	<410	19	88	300	<1.0
1,2-Dibromo-3-chloropropane	ug/kg	<410	<16	<16	<15	<1.0
1,2-Dibromoethane	ug/kg	<410	<16	<16	<15	<1.0
1,2-Dichlorobenzene	ug/kg	<410	<16	<16	<15	<1.0
1,2-Dichloroethane	ug/kg	<410	<16	<16	<15	<1.0
1,2-Dichloropropane	ug/kg	2600	<16	<16	<15	<1.0
1,3,5-Trimethylbenzene	ug/kg	<410	<16	24	100	<1.0
1,3-Dichlorobenzene	ug/kg	<410	<16	<16	<15	<1.0
1,3-Dichloropropane	ug/kg	<410	<16	<16	<15	<1.0
1,4-Dichlorobenzene	ug/kg	<410	<16	<16	<15	<1.0
1-Chlorohexane	ug/kg	<410	<16	<16	<15	<1.0
2,2-Dichloropropane	ug/kg	<410	<16	<16	<15	<1.0
2-Butanone	ug/kg	<2000	<80	<80	<75	<5.0
2-Chloroethyl vinyl ether	ug/kg	<410	<16	<16	<15	<1.0
2-Chlorotoluene	ug/kg	<410	<16	<16	<15	<1.0
2-Hexanone	ug/kg	<2000	<80	<80	<80	<5.0
4-Chlorotoluene	ug/kg	<410	<16	<16	<15	<1.0
4-Methyl-2-pentanone	ug/kg	<2000	<80	<80	<75	<5.0
Acetone	ug/kg	<2000	<80	<80	<75	<5.0
Acrylonitrile	ug/kg	<2000	<80	<80	<75	<5.0

Episode #:		7827				
Lab Sample ID		1		3	4	8
Client Sample I D		CC (2-4)	CC (3-5)	CC (5-7)	CC (1-7)	Trip Blank
Matrix		Soil	Soil	Soil	Soil	Water
						ug/l
Date Sampled		5/1/02	5/1/02	5/1/02	5/1/02	5/1/02
Dilution Factor		9:20	9:57	11:00	11:35	
	Units					
VOA 8260B(Contd...)						
Benzene	ug/kg	<410	<16	<16	**19**	<1.0
Bromobenzene	ug/kg	<410	<16	<16	<15	<1.0
Bromochloromethane	ug/kg	<410	<16	<16	<15	<1.0
Bromodichloromethane	ug/kg	<410	<16	<16	<15	<1.0
Bromoform	ug/kg	<410	<16	<16	<15	<1.0
Bromomethane	ug/kg	<410	<16	<16	<15	<1.0
Carbon disulfide	ug/kg	<410	<16	<16	<15	<1.0
Carbon tetrachloride	ug/kg	<410	<16	<16	<15	<1.0
Chlorobenzene	ug/kg	<410	<16	<16	<15	<1.0
Chloroethane	ug/kg	<410	<16	<16	<15	<1.0
Chloroform	ug/kg	<410	<16	<16	<15	<1.0
Chloromethane	ug/kg	<410	<16	<16	<15	<1.0
cis-1,2-Dichloroethene	ug/kg	<410	<16	<16	<15	<1.0
cis-1,3-Dichloropropene	ug/kg	<410	<16	<16	<15	<1.0
Dibromochloromethane	ug/kg	<410	<16	<16	<15	<1.0
Dibromomethane	ug/kg	<410	<16	<16	<15	<1.0
Dichlorodifluoromethane	ug/kg	<410	<16	<16	<15	<1.0
Ethyl benzene	ug/kg	**1600**	**51**	**200**	**370**	<1.0
Hexachlorobutadiene	ug/kg	<410	<16	<16	<15	<1.0
Iodomethane	ug/kg	<410	<16	<16	<15	<1.0
Isopropylbenzene	ug/kg	<410	<16	<16	**24**	<1.0
m/p-xylene	ug/kg	**7600**	**180**	**640**	**1800**	<2.0
Methyl t-Butylether	ug/kg	<410	<16	<16	<15	<1.0
Methylene chloride	ug/kg	<410	<16	<16	<15	<1.0
n-Butylbenzene	ug/kg	**920**	<16	<16	**44**	<1.0
n-Propylbenzene	ug/kg	**700**	<16	<16	**39**	<1.0
Naphthalene	ug/kg	**1100** J	<16 J	**29** J	**40** J	<1.0 J
o-Xylene	ug/kg	**3400**	**48**	**210**	**570**	<1.0
p-Isopropyltoluene	ug/kg	**510**	<16	<16	<15	<1.0
sec-Butylbenzene	ug/kg	<410	<16	<16	<15	<1.0
Styrene	ug/kg	<410	<16	<16	**16**	<1.0
tert-Butylbenzene	ug/kg	<410	<16	<16	<15	<1.0
Tetrachloroethene	ug/kg	<410	<16	<16	**17**	<1.0
Toluene	ug/kg	**940**	**240**	**850**	**1500**	<1.0
trans-1,2-Dichloroethene	ug/kg	<410	<16	<16	<15	<1.0
trans-1,3-Dichloropropene	ug/kg	<410	<16	<16	<15	<1.0
Trichloroethene	ug/kg	<410	<16	<16	<15	<1.0
Trichlorofluoromethane	ug/kg	<410	<16	<16	<15	<1.0
Vinyl Acetate	ug/kg	<2000	80	<80	<80	<5.0
Vinyl chloride	ug/kg	<410	<16	<16	<15	<1.0

000002

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ACE Technologies Inc.
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The Woodlands, TX 78130
Phone: (281) 363-2233
Fax : (281) 298-5784

Date: 5/16/02

Attn: Mr. Rick Mehl / Ms. Tonya Balla

SEMI VOLATILES

Project Name: Calumet Container

Episode #:		7827						
Lab Sample ID		1	2	3	4	9	10	11
Client Sample I D		CC (2-4)	CC (3-5)	CC (5-7)	CC (1-7)	CC (0-3)	CC (0-4)	CC (1-3)
		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date Sampled		5/1/02	5/1/02	5/1/02	5/1/02	5/1/02	5/1/02	5/1/02
Time Sampled		9:20	9:57	11:00	11:35	16:30	16:45	17:00
	Units							
SVOA 8270C								
1,2,4-Trichlorobenzene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
1,2-Dichlorobenzene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
1,3-Dichlorobenzene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
1,4-Dichlorobenzene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
2,2`-oxybis (1-Chloropropane)	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
2,3,4,6-Tetrachlorophenol	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
2,4,5-Trichlorophenol	ug/kg	<5400	<5300	<5400	<2000	<5400	<5100	<5800
2,4,6-Trichlorophenol	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
2,4-Dichlorophenol	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
2,4-Dimethylphenol	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
2,4-Dinitrophenol	ug/kg	<5400	<5300	<5400	<5000	<5400	<5100	<5800
2,4-Dinitrotoluene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
2,6-Dinitrotoluene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
2-Chloronaphthalene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
2-Chlorophenol	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
2-Methylnaphthalene	ug/kg	<2200	<2100	<2200	**4700**	<2200	<2000	<2300
2-Methylphenol	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
2-Nitroaniline	ug/kg	<5400	<5300	<5400	<2000	<5400	<5100	<5800
2-Nitrophenol	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
3,3`-Dichlorobenzidine	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
3-Nitroaniline	ug/kg	<5400	<5300	<5400	<5000	<5400	<5100	<5800
4,6-Dinitro-2-methylphenol	ug/kg	<5400	<5300	<5400	<5000	<5400	<5100	<5800
4-Bromophenyl phenyl ether	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
4-Chloro-3-methylphenol	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
4-Chloroaniline	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
4-Chlorophenyl phenyl ether	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
4-Methylphenol	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
4-Nitroaniline	ug/kg	<5400	<5300	<5400	<5000	<5400	<5100	<5800
4-Nitrophenol	ug/kg	<5400	<5300	<5400	<5000	<5400	<5100	<5800
Acenaphthene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300

Episode #:		7827						
Lab Sample ID		1		3	4	9	10	
Client Sample I D		CC (2-4)	CC (3-5)	CC (5-7)	CC (1-7)	CC (0-3)	CC (0-4)	CC (1-3)
Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date Sampled		5/1/02	5/1/02	5/1/02	5/1/02	5/1/02	5/1/02	5/1/02
Dilution Factor		9:20	9:57	11:00	11:35	16:30	16:45	17:00
	Units							
SVOA 8270C								
Acenaphthylene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Aniline	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Anthracene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Benzo(a)anthracene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Benzo(a)pyrene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Benzo(b)fluoranthene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Benzo(g,h,i)perylene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Benzo(k)fluoranthene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Benzoic acid	ug/kg	<5400	<5300	<5400	<5000	<5400	<5100	<5800
Benzyl alcohol	ug/kg	<5400	<5300	<5400	<5000	<5400	<5100	<5800
Bis(2-chloroethoxy)methane	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Bis(2-chloroethyl)ether	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Bis(2-chloroisopropyl) ether	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Bis(2-ethylhexyl)phthalate	ug/kg	<2200	**7300**	<2200	**12000**	**14000**	**12000**	<2300
Butylbenzylphthalate	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Carbazole	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Chrysene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Di-n-butylphthalate	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Di-n-octylphthalate	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Dibenzo(a,h)anthracene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Dibenzofuran	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Diethylphthalate	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Dimethylphthalate	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Fluoranthene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Fluorene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Hexachlorobenzene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Hexachlorobutadiene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Hexachlorocyclopentadiene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Hexachloroethane	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Indeno(1,2,3-c,d)pyrene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Isophorone	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
N-Nitroso-di-n-propylamine	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
N-Nitrosodimethylamine	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
N-Nitrosodiphenylamine	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Naphthalene	ug/kg	<2200	<2100	<2200	**8300**	<2200	<2000	<2300
Nitrobenzene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Pentachlorophenol	ug/kg	<5400	<5300	<5400	<5000	<5400	<5100	<5800
Phenanthrene	ug/kg	<2200	<2100	<2200	<2000	<5400	<5100	<2300
Phenol	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300
Pyrene	ug/kg	<2200	<2100	<2200	<2000	<2200	<2000	<2300

000004

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A[illegible] Technologies Inc.
1680 Lake Front Circle, Ste. B
The Woodlands, TX 78130
Phone: (281) 363-2233
Fax : (281) 298-5784

Date: 5/16/02

Attn: Mr. Rick Mehl / Ms. Tonya Balla

Metals

Project Name: Calumet Container

Episode #:		7827		
Lab Sample ID		5	6	7
Client Sample I D		CC (3-7)	CC (4,7)	CC (3-8)
		Soil	Soil	Soil
Date Sampled		5/1/02	5/1/02	5/1/02
Time Sampled		11:30	11:15	14:24
	Units			
TAL Metals				
Aluminum	mg/kg	5600	2200	2000
Antimony	mg/kg	<45 J	<4.6 J	<4.6 J
Arsenic	mg/kg	64.9	6.51	14.4 J
Barium	mg/kg	71	28	160 J
Berryllium	mg/kg	<3.75	<0.38	0.345 J
Cadmium	mg/kg	<3.75 J	<0.38 J	2.64 J
Calcium	mg/kg	93000	12000	88000
Chromium	mg/kg	780	9.4	170 J
Cobalt	mg/kg	6.7	1.9	6.6
Copper	mg/kg	28 J	15 J	140 J
Iron	mg/kg	120000	8100	19000
Lead	mg/kg	133	30.5	805 J
Magnesium	mg/kg	37000	5100	49000
Manganese	mg/kg	25000	450	1800
Mercury	mg/kg	0.3	0.08	0.96 J
Nickel	mg/kg	<15 J	4.9 J	12 J
Potassim	mg/kg	<750	220	440
Selenium	mg/kg	<5.25	<0.53	<0.535 J
Silver	mg/kg	<3.7	<0.38	1.2
Sodium	mg/kg	<750	<76	160
Thalium	mg/kg	12.9	0.609	1.29 J
Vanadium	mg/kg	240	7.0	38 J
Zinc	mg/kg	38	62 J	260

000005

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ARC Technologies Inc.
1600 Lake Front Circle, Ste. B
The Woodlands, TX 78130
Phone: (281) 363-2233
Fax : (281) 298-5784

Date: 5/16/02

Attn: Mr. Rick Mehl/ Ms. Tonya Balla

PESTICIDES

Project Name: Calumet Container

Episode #:		7827						
Lab Sample ID		1	2	3	4	9	10	11
Client Sample I D		CC (2-4)	CC (3-5)	CC (5-7)	CC (1-7)	CC (0-3)	CC (0-4)	CC (1-3)
		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date Sampled		5/1/02	5/1/02	5/1/02	5/1/02	5/1/02	5/1/02	5/1/02
Time Sampled		9:20	9:57	11:00	11:35	16:30	16:45	17:00
	Units							
Pesticides								
4,4'-DDD	ug/kg	<8.6 J	<8.6 J	<8.7 J	<8.0 J	<8.7 J	<8.1 J	<9.2 J
4,4'-DDE	ug/kg	<8.6	<8.6	<8.7	<8.0	<8.7	<8.1	<9.2
4,4'-DDT	ug/kg	**38**	<8.6	**14**	**64**	**210**	**220**	**66**
Aldrin	ug/kg	<4.3	<4.3	<4.3	**25**	<4.3	<4.0	<4.6
alpha-BHC	ug/kg	<4.3	<4.3	<4.3	<4.0	<4.3	<4.0	<4.6
beta-BHC	ug/kg	<4.3	<4.3	<4.3	<4.0	<4.3	<4.0	<4.6
Chlordane(Technical)	ug/kg	**15**	**94**	**8.7**	<8.0	**75**	**84**	**41**
delta-BHC	ug/kg	<4.3	<4.3	<4.3	<4.0	<4.3	<4.0	<4.6
Dieldrin	ug/kg	<8.6	<8.6	<8.7	<8.0	<8.7	<8.1	<9.2
Endosulfan II	ug/kg	<8.6	<8.6	<8.7	<8.0	<8.7	<8.1	<9.2
Endosulfon Sulfate	ug/kg	<8.6	<8.6	<8.7	<8.0	<8.7	<8.1	<9.2
Endosulfon -1	ug/kg	<4.3	<4.3	<4.3	<4.0	<4.3	<4.0	<4.6
Endrin	ug/kg	<8.6	<8.6	<8.7	<8.0	<8.7	<8.1	<9.2
Endrin Aldehyde	ug/kg	<8.6	<8.6	<8.7	<8.0	<8.7	<8.1	<9.2
Endrin Ketone	ug/kg	<8.6	<8.6	<8.7	<8.0	<8.7	<8.1	<9.2
gamma-BHC	ug/kg	<4.3	<4.3	<4.3	<4.0	<4.3	<4.0	<4.6
Heptachlor	ug/kg	<4.3	<4.3	<4.3	<4.0	<4.3	<4.0	<4.6
Heptachlor Epoxide	ug/kg	<4.3	<4.3	<4.3	<4.0	<4.3	<4.0	<4.6
Methoxychlor	ug/kg	<43	<43	<44	<40	<44	<41	<46
Toxaphene	ug/kg	<86 J	<85 J	<87 J	<80 J	<87 J	<81 J	<92 J

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The Woodlands, TX 78130
Phone: (281) 363-2233
Fax : (281) 298-5784

Date: 5/16/02

Attn: Mr. Rick Mehl/Tonya Balla

PCB's

Project Name: Calumet Container

Episode #:		7827						
Lab Sample ID		1	2	3	4	9	10	11
Client Sample I D		CC (2-4)	CC (3-5)	CC (5-7)	CC (1-7)	CC (0-3)	CC (0-4)	CC (1-3)
		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date Sampled		5/1/02	5/1/02	5/1/02	5/1/02	5/1/02	5/1/02	5/1/02
Time Sampled		9:20	9:57	11:00	11:35	16:30	16:45	17:00
	Units							
PCB's								
Aroclor 1016	ug/kg	<86	<85	<87	<80	<87	<81	<92
Aroclor 1221	ug/kg	<86	<85	<87	<80	<87	<81	<92
Aroclor 1232	ug/kg	<86	<85	<87	<80	<87	<81	<92
Aroclor 1242	ug/kg	<86	<85	<87	<80	<87	<81	<92
Aroclor 1248	ug/kg	<86	<85	<87	<80	<87	<81	<92
Aroclor 1254	ug/kg	<86	<85	<87	<80	<87	<81	<92
Aroclor 1260	ug/kg	<86	<85	<87	<80	<87	<81	<92

000007

.L Certificate of Analysis Sum· ry WO# 1943

Client : Roy F. Weston, Inc.- Illinois, Vernon Hills, IL

Client Project Name: Calumet Container

Client Project #: 0222
Client Contact: Rick Mehl
Project Location:
Quote Number:
Email / Fax Number:

Date Received in Lab: 05/01/02 10:20
Report Date: 05/28/02 11:10
AAL Contact: Michael Trinidad
e-Mail: miket@accura.com

Analysis Requested	*Lab ID :*	1943-001		1943-002		1943-003		1943-004		1943-005		1943-006	
	Field ID :	CC (0-0)		CC (0-1)		CC (0-2)		CC (0-3)		CC (1-3)		CC (0-4)	
	Depth :												
	Matrix :	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled :	04/30/02 13:20		04/30/02 13:30		04/30/02 14:20		04/30/02 14:35		04/30/02 15:42		04/30/02 14:50	
Percent Solids by CLP	*Prep Date:*												
	Analyzed:	05/17/02 13:00		05/17/02 13:00		05/17/02 13:00		05/17/02 13:00		05/17/02 13:00		05/17/02 13:00	
	Units:	%		%		%		%		%		%	
		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Percent Solids		75.0	1.00	83.0	1.00	87.0	1.00	87.0	1.00	79.0	1.00	85.0	1.00

<RL = Less Than Reporting Limit

AAL Certificate of Analysis Summary WO# 1943

Client : Roy F. Weston, Inc.- Illinois, Vernon Hills, IL

Client Project Name: Calumet Container

Client Project #: 0222
Client Contact: Rick Mehl
Project Location:
Quote Number:
Email / Fax Number:

Date Received in Lab: 05/01/02 10:20
Report Date: 05/28/02 11:10
AAL Contact: Michael Trinidad
e-Mail: miket@accura.com

Analysis Requested	*Lab ID :*	1943-001		1943-002		1943-003		1943-004		1943-005		1943-006	
	Field ID :	CC (0-0)		CC (0-1)		CC (0-2)		CC (0-3)		CC (1-3)		CC (0-4)	
	Depth :												
	Matrix :	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled :	04/30/02 13:20		04/30/02 13:30		04/30/02 14:20		04/30/02 14:35		04/30/02 15:42		04/30/02 14:50	
VOCs by SW8260B	*Prep Date:*	05/03/02 11:23		05/03/02 11:23		05/03/02 11:23		05/03/02 11:23		05/03/02 11:23		05/03/02 11:23	
	Analyzed:	05/03/02 14:18		05/03/02 15:22		05/03/02 15:52		05/03/02 20:08		05/03/02 20:35		05/03/02 19:41	
	Units:	ug/kg		ug/kg		ug/kg		ug/kg		ug/kg		ug/kg	
		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
1,1,1-Trichloroethane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
1,1,2,2-Tetrachloroethane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
1,1,2-Trichloroethane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
1,1-Dichloroethane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
1,1-Dichloroethene		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
1,2-Dichloroethane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
1,2-Dichloropropane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
2-Butanone		<RL	33000	<RL	300000	<RL	290000	<RL	140000	<RL	63000	<RL	29000
2-Hexanone		<RL	33000	<RL	300000	<RL	290000	<RL	140000	<RL	63000	<RL	29000
4-Methyl-2-Pentanone		<RL	33000	<RL	300000	<RL	290000	<RL	140000	<RL	63000	<RL	29000
Acetone		<RL	33000	<RL	300000	<RL	290000	<RL	140000	<RL	63000	<RL	29000
Benzene		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Bromodichloromethane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Bromoform		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Bromomethane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Carbon Disulfide		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900

<RL = Less Than Reporting Limit

AAL Certificate of Analysis Summary WO# 1943

Client : Roy F. Weston, Inc.- Illinois, Vernon Hills, IL

Client Project Name: Calumet Container

Client Project #: 0222
Client Contact: Rick Mehl
Project Location:
Quote Number:
Email / Fax Number:

Date Received in Lab: 05/01/02 10:20
Report Date: 05/28/02 11:10
AAL Contact: Michael Trinidad
e-Mail: miket@accura.com

Analysis Requested	*Lab ID :*	1943-001		1943-002		1943-003		1943-004		1943-005		1943-006	
	Field ID :	CC (0-0)		CC (0-1)		CC (0-2)		CC (0-3)		CC (1-3)		CC (0-4)	
	Depth :												
	Matrix :	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled :	04/30/02 13:20		04/30/02 13:30		04/30/02 14:20		04/30/02 14:35		04/30/02 15:42		04/30/02 14:50	
VOCs by SW8260B	*Prep Date:*	05/03/02 11:23		05/03/02 11:23		05/03/02 11:23		05/03/02 11:23		05/03/02 11:23		05/03/02 11:23	
	Analyzed:	05/03/02 14:18		05/03/02 15:22		05/03/02 15:52		05/03/02 20:08		05/03/02 20:35		05/03/02 19:41	
	Units:	ug/kg		ug/kg		ug/kg		ug/kg		ug/kg		ug/kg	
		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Carbon Tetrachloride		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Chlorobenzene		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Chloroethane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Chloroform		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Chloromethane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
cis-1,2-Dichloroethene		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
cis-1,3-Dichloropropene		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Dibromochloromethane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Ethylbenzene		51000	3300	750000	30000	620000	29000	390000	14000	59000	6300	<RL	2900
Methylene Chloride		<RL	6700	<RL	60000	<RL	57000	<RL	29000	<RL	13000	<RL	5900
Styrene		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Tetrachloroethene		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Toluene		<RL	3300	8400000	750000	3600000	140000	22000	14000	<RL	6300	<RL	2900
trans-1,2-Dichloroethene		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
trans-1,3-Dichloropropene		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Trichloroethene		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900

<RL = Less Than Reporting Limit

AAL Certificate of Analysis Summary WO# 1943

Client : Roy F. Weston, Inc.- Illinois, Vernon Hills, IL

Client Project Name: Calumet Container

Client Project #: 0222
Client Contact: Rick Mehl
Project Location:
Quote Number:
Email / Fax Number:

Date Received in Lab: 05/01/02 10:20
Report Date: 05/28/02 11:10
AAL Contact: Michael Trinidad
e-Mail: miket@accura.com

Analysis Requested	*Lab ID :*	1943-001		1943-002		1943-003		1943-004		1943-005		1943-006	
	Field ID :	CC (0-0)		CC (0-1)		CC (0-2)		CC (0-3)		CC (1-3)		CC (0-4)	
	Depth :												
	Matrix :	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled :	04/30/02 13:20		04/30/02 13:30		04/30/02 14:20		04/30/02 14:35		04/30/02 15:42		04/30/02 14:50	
VOCs by SW8260B	*Prep Date:*	05/03/02 11:23		05/03/02 11:23		05/03/02 11:23		05/03/02 11:23		05/03/02 11:23		05/03/02 11:23	
	Analyzed:	05/03/02 14:18		05/03/02 15:22		05/03/02 15:52		05/03/02 20:08		05/03/02 20:35		05/03/02 19:41	
	Units:	ug/kg		ug/kg		ug/kg		ug/kg		ug/kg		ug/kg	
		Results	RL	Results	RL	Results	RL	Results	RL	Results	RL	Results	RL
Trichlorofluoromethane		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Vinyl Acetate		<RL	67000	<RL	600000	<RL	570000	<RL	290000	<RL	130000	<RL	59000
Vinyl Chloride		<RL	3300	<RL	30000	<RL	29000	<RL	14000	<RL	6300	<RL	2900
Xylenes, Total		240000	10000	4200000	450000	2300000	86000	1700000	43000	87000	19000	16000	8800

<RL = Less Than Reporting Limit

AAL Certificate of Analysis Summary WO# 1943

Client : Roy F. Weston, Inc.- Illinois. Vernon Hills, IL

Client Project Name: Calumet Container

Client Project #: 0222
Client Contact: Rick Mehl
Project Location:
Quote Number:
Email / Fax Number:

Date Received in Lab: 05/01/02 10:20
Report Date: 05/28/02 11:10
AAL Contact: Michael Trinidad
e-Mail: miket@accura.com

Analysis Requested	*Lab ID :*	1943-007		1943-008					
	Field ID :	CC (2-3)		CC (1-5)					
	Depth :								
	Matrix :	SOIL		SOIL					
	Sampled :	04/30/02 16:03		04/30/02 16:32					
Percent Solids by CLP	*Prep Date:*								
	Analyzed:	05/17/02 13:00		05/10/02 10:30					
	Units:	%		%					
		Results	RL	Results	RL				
Percent Solids		91.0	1.00	78	1.0				

<RL = Less Than Reporting Limit

AAL Certificate of Analysis Summary WO# 1943

Client : Roy F. Weston, Inc.- Illinois, Vernon Hills, IL

Client Project Name: Calumet Container

Client Project #: 0222
Client Contact: Rick Mehl
Project Location:
Quote Number:
Email / Fax Number:

Date Received in Lab: 05/01/02 10:20
Report Date: 05/28/02 11:10
AAL Contact: Michael Trinidad
e-Mail: miket@accura.com

Analysis Requested	*Lab ID :*	1943-007		1943-008					
	Field ID :	CC (2-3)		CC (1-5)					
	Depth :								
	Matrix :	SOIL		SOIL					
	Sampled :	04/30/02 16:03		04/30/02 16:32					
VOCs by SW8260B	*Prep Date:*	05/03/02 11:23		05/03/02 11:23					
	Analyzed:	05/03/02 17:48		05/03/02 18:15					
	Units:	ug/kg		ug/kg					
		Results	RL	Results	RL				
1,1,1-Trichloroethane		<RL	2700	<RL	32000				
1,1,2,2-Tetrachloroethane		<RL	2700	<RL	32000				
1,1,2-Trichloroethane		<RL	2700	<RL	32000				
1,1-Dichloroethane		<RL	2700	<RL	32000				
1,1-Dichloroethene		<RL	2700	<RL	32000				
1,2-Dichloroethane		<RL	2700	<RL	32000				
1,2-Dichloropropane		<RL	2700	<RL	32000				
2-Butanone		<RL	27000	<RL	320000				
2-Hexanone		<RL	27000	<RL	320000				
4-Methyl-2-Pentanone		<RL	27000	<RL	320000				
Acetone		<RL	27000	<RL	320000				
Benzene		<RL	2700	<RL	32000				
Bromodichloromethane		<RL	2700	<RL	32000				
Bromoform		<RL	2700	<RL	32000				
Bromomethane		<RL	2700	<RL	32000				
Carbon Disulfide		<RL	2700	<RL	32000				

<RL = Less Than Reporting Limit

AAL Certificate of Analysis Summary WO# 1943

Client : Roy F. Weston, Inc.- Illinois Vernon Hills, IL

Client Project Name: Calumet Container

Client Project #: 0222
Client Contact: Rick Mehl
Project Location:
Quote Number:
Email / Fax Number:

Date Received in Lab: 05/01/02 10:20
Report Date: 05/28/02 11:10
AAL Contact: Michael Trinidad
e-Mail: miket@accura.com

Analysis Requested	*Lab ID :*	1943-007		1943-008					
	Field ID :	CC (2-3)		CC (1-5)					
	Depth :								
	Matrix :	SOIL		SOIL					
	Sampled :	04/30/02 16:03		04/30/02 16:32					
VOCs by SW8260B	*Prep Date:*	05/03/02 11:23		05/03/02 11:23					
	Analyzed:	05/03/02 17:48		05/03/02 18:15					
	Units:	ug/kg		ug/kg					
		Results	RL	Results	RL				
Carbon Tetrachloride		<RL	2700	<RL	32000				
Chlorobenzene		<RL	2700	<RL	32000				
Chloroethane		<RL	2700	<RL	32000				
Chloroform		<RL	2700	<RL	32000				
Chloromethane		<RL	2700	<RL	32000				
cis-1,2-Dichloroethene		<RL	2700	<RL	32000				
cis-1,3-Dichloropropene		<RL	2700	<RL	32000				
Dibromochloromethane		<RL	2700	<RL	32000				
Ethylbenzene		21000	2700	970000	32000				
Methylene Chloride		<RL	5500	<RL	64000				
Styrene		<RL	2700	<RL	32000				
Tetrachloroethene		<RL	2700	<RL	32000				
Toluene		6900	2700	1200000	32000				
trans-1,2-Dichloroethene		<RL	2700	<RL	32000				
trans-1,3-Dichloropropene		<RL	2700	<RL	32000				
Trichloroethene		<RL	2700	<RL	32000				

<RL = Less Than Reporting Limit

AAL Certificate of Analysis Summary WO# 1943

Client : Roy F. Weston, Inc.- Illinois, Vernon Hills, IL

Client Project Name: Calumet Container

Client Project #: 0222
Client Contact: Rick Mehl
Project Location:
Quote Number:
Email / Fax Number:

Date Received in Lab: 05/01/02 10:20
Report Date: 05/28/02 11:10
AAL Contact: Michael Trinidad
e-Mail: miket@accura.com

Analysis Requested	*Lab ID :*	1943-007		1943-008					
	Field ID :	CC (2-3)		CC (1-5)					
	Depth :								
	Matrix :	SOIL		SOIL					
	Sampled :	04/30/02 16:03		04/30/02 16:32					
VOCs by SW8260B	*Prep Date:*	05/03/02 11:23		05/03/02 11:23					
	Analyzed:	05/03/02 17:48		05/03/02 18:15					
	Units:	ug/kg		ug/kg					
		Results	RL	Results	RL				
Trichlorofluoromethane		<RL	2700	<RL	32000				
Vinyl Acetate		<RL	55000	<RL	640000				
Vinyl Chloride		<RL	2700	<RL	32000				
Xylenes, Total		66000	8200	3200000	96000				

<RL = Less Than Reporting Limit

Chain of Custody Record

PDP Analytical Services
1680 Lake Front Circle, Suite B ▪ The Woodlands, Texas 77380 ▪ Phone (281) 363-2233 ▪ Fax (281) 298-5784

P.O. # 1143

Client Name / Address: Roy F. Weston, Inc. 750 East Bunker Court Vernon Hills, IL 60061	Send Report to: Rick Mehl
Client Phone #: 847-918-4041	Client Fax #: 847-918-4055
Project Number: 0222	Project Name: Calumet Container
Samplers (Signature): Don Pyston	P.O. Number:

Sample Identification	Date	Time	Comp.	Grab	Number of Containers	Matrix	VOC (40ml)	TAL Metals (4oz)					Remarks	AALTD
CC (0,0)	4-30-02	1320		X	1	Soil	X						* All samples preserved with ice, water samples with HCl.	143-001
CC (0,1)	4-30-02	1330		X	1	Soil	X							-002
CC (0,2)		1420			1		X							-003
CC (0,3)		1435			1		X							-004
CC (1,3)		1542			1		X							-005
CC (0,4)		1450			1		X							-006
CC (2,3)		1603			1		X							-007
CC (1,5)	4-30-02	1632		X	2	Soil	X	X						-008
Trip Blank					1	Water	X							-009
Temperature Blank					1	Water								

Relinquished by (Signature)	Date / Time	Received by (Signature)	Date / Time	Remarks:
Don Pyston	4-30-02 1800			
Relinquished by (Signature): Fedex	Date / Time: 5/1/02 10:20	Received by (Signature): [illegible]	Date / Time: 5/1/02 10:20	
Relinquished by (Signature)	Date / Time	Received for Laboratory by (Signature)	Date / Time	

Method of Shipment: Federal Express

PDP Quote Number:

Distribution: Original accompanies shipment; Copy to coordinator and field files

Roy F Weston, Inc.
750 E Bunker Ct, Suite 500
Vernon Hills, IL 60061
Tel: (847) 918-4041
Fax: (847) 918-4055

ACE Technologies, Inc.
1680 Lake Front Circle, Ste. B
The Woodlands, TX 78130
Phone: (281) 363-2233
Fax : (281) 298-5784

Date: 6/5/02

Attn: Mr. Rick Mehl/ Ms. Tonya Balla

Volatiles

Project Name: Calumet Container

Episode #:			7913										7916			
Lab Sample ID			1	2	3	4	5	6	7	8	9	10	1	2	3	4
Weaton Sample ID			6, 7	SD-02	5, 6	0, 10	0, 10	2,8	1,9	1,9	2, 8	1, 8	3, 10	1, 2	0.5, 2.5	0.5, 2.5
			(3'-4')		(0-6")	(3'-4')	(3'-4')DUP	(0-6")	(3'-4')	(3'-4')DUP	(2'-4')	(3'-4')	(0-2')	(2-3')	(1'-2')	(3'-4')
Date Sampled			5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/21/02	5/21/02	5/21/02	5/21/02
Dilution			1000								125		1			
	Units	RL														
VOA8260B																
1,1,1,2-Tetrachloroethane	ug/kg	5	<1300								<170		<7.3			
1,1,1-Trichloroethane	ug/kg	5	<1300								<170		<7.3			
1,1,2,2-Tetrachloroethane	ug/kg	5	<1300								<170		<7.3			
1,1,2-Trichloroethane	ug/kg	5	<1300								<170		<7.3			
1,1-Dichloroethane	ug/kg	5	<1300								<170		<7.3			
1,1-Dichloroethene	ug/kg	5	<1300								<170		<7.3			
1,1-Dichloropropene	ug/kg	5	<1300								<170		<7.3			
1,2,3-Trichlorobenzene	ug/kg	5	<1300								<170		<7.3			
1,2,3-Trichloropropane	ug/kg	5	<1300								<170		<7.3			
1,2,4-Trichlorobenzene	ug/kg	5	<1300								<170		<7.3			
1,2,4-Trimethylbenzene	ug/kg	5	**18000**								**670**		**17**			
1,2-Dibromo-3-chloropropane	ug/kg	5	<1300								<170		<7.3			
1,2-Dibromoethane	ug/kg	5	<1300								<170		<7.3			
1,2-Dichlorobenzene	ug/kg	5	<1300								<170		<7.3			
1,2-Dichloroethane	ug/kg	5	<1300								<170		<7.3			
1,2-Dichloropropane	ug/kg	5	<1300								<170		<7.3			
1,3,5-Trimethylbenzene	ug/kg	5	**5600**								**200**		**32**			
1,3-Dichlorobenzene	ug/kg	5	<1300								<170		<7.3			
1,3-Dichloropropane	ug/kg	5	<1300								<170		<7.3			
1,4-Dichlorobenzene	ug/kg	5	<1300								<170		<7.3			
1-Chlorohexane	ug/kg	5	<1300								<170		<7.3			
2,2-Dichloropropane	ug/kg	5	<1300								<170		<7.3			
2-Butanone	ug/kg	25	<6500								<870		**140**			
2-Chloroethyl vinyl ether	ug/kg	5	<1300								<170		<7.3			
2-Chlorotoluene	ug/kg	5	<1300								<170		<7.3			
2-Hexanone	ug/kg	25	<6500								<870		<36			
4-Chlorotoluene	ug/kg	5	<1300								<170		<7.3			
4-Methyl-2-pentanone	ug/kg	25	<6500								<870		<36			
Acetone	ug/kg	25	<6500								<870		**180**			
Acrylonitrile	ug/kg	25	<6500								<870		<36			
Benzene	ug/kg	5	<1300								<170		<7.3			

Episode #:			7913										7916			
Lab Sample ID			1	2	3	4	5	6	7	8	9	10	1	2	3	4
Calumet Sample ID			6, 7	SD-02	5, 6	0, 10	0, 10	2,8	1,9	1,9	2, 8	1, 8	3, 10	1, 2	0.5, 2.5	0.5, 2.5
			(3'-4')		(0-6")	(3'-4')	(3'-4')DUP	(0-6")	(3'-4')	(3'-4')DUP	(2'-4')	(3'-4')	(0-2')	(2-3')	(1'-2')	(3'-4')
Date Sampled			5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/21/02	5/21/02	5/21/02	5/21/02
Dilution			1000								125		1			
	Units	**RL**														
VOA8260B(Contd....)																
Bromobenzene	ug/kg	5	<1300								<170		<7.3			
Bromochloromethane	ug/kg	5	<1300								<170		<7.3			
Bromodichloromethane	ug/kg	5	<1300								<170		<7.3			
Bromoform	ug/kg	5	<1300								<170		<7.3			
Bromomethane	ug/kg	5	<1300								<170		<7.3			
Carbon disulfide	ug/kg	5	<1300								<170		<7.3			
Carbon tetrachloride	ug/kg	5	<1300								<170		<7.3			
Chlorobenzene	ug/kg	5	<1300								<170		<7.3			
Chloroethane	ug/kg	5	<1300								<170		<7.3			
Chloroform	ug/kg	5	<1300								<170		<7.3			
Chloromethane	ug/kg	5	<1300								<170		<7.3			
cis-1,2-Dichloroethene	ug/kg	5	<1300								<170		<7.3			
cis-1,3-Dichloropropene	ug/kg	5	<1300								<170		<7.3			
Dibromochloromethane	ug/kg	5	<1300								<170		<7.3			
Dibromomethane	ug/kg	5	<1300								<170		<7.3			
Dichlorodifluoromethane	ug/kg	5	<1300								<170		<7.3			
Ethyl benzene	ug/kg	5	**14000**								**550**		<7.3			
Hexachlorobutadiene	ug/kg	5	<1300								<170		<7.3			
Iodomethane	ug/kg	5	<1300								<170		<7.3			
Isopropylbenzene	ug/kg	5	**1100**								<170		<7.3			
m/p-xylene	ug/kg	10	**57000**								**2200**		**71**			
Methyl t-Butylether	ug/kg	5	<1300								<170		<7.3			
Methylene chloride	ug/kg	5	<1300								<170		<7.3			
n-Butylbenzene	ug/kg	5	**2400**								**220**		<7.3			
n-Propylbenzene	ug/kg	5	**2000**								<170		<7.3			
Naphthalene	ug/kg	5	**8600**								**580**		**12**			
o-Xylene	ug/kg	5	**18000**								**740**		**52**			
p-Isopropyltoluene	ug/kg	5	**1300**								<170		<7.3			
sec-Butylbenzene	ug/kg	5	<1300								<170		<7.3			
Styrene	ug/kg	5	<1300								<170		<7.3			
tert-Butylbenzene	ug/kg	5	<1300								<170		<7.3			
Tetrachloroethene	ug/kg	5	<1300								<170		<7.3			
Toluene	ug/kg	5	**1200**								<170		<7.3			
trans-1,2-Dichloroethene	ug/kg	5	<1300								<170		<7.3			
trans-1,3-Dichloropropene	ug/kg	5	<1300								<170		<7.3			
Trichloroethene	ug/kg	5	<1300								<170		<7.3			
Trichlorofluoromethane	ug/kg	5	<1300								<170		<7.3			
Vinyl Acetate	ug/kg	25	<33000								<4300		<36			
Vinyl chloride	ug/kg	5	<1300								<170		<7.3			

Roy F Weston, Inc.												**ACE Technologies, Inc.**				
750 E Bunker Ct, Suite 500												**1680 Lake Front Circle, Ste. B**				
Vernon Hills, IL 60061												**The Woodlands, TX 78130**				
Tel: (847) 918-4041												**Phone: (281) 363-2233**				
Fax: (847) 918-4055												**Fax : (281) 298-5784**				
												Date:	**6/5/02**			
Attn: Mr. Rick Mehl/ Ms. Tonya Balla						**BTEX**						**Project Name: Calumet Container**				
Episode #:			**7913**										**7916**			
Lab Sample ID			**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**
Weaton Sample ID			**6, 7**	**SD-02**	**5, 6**	**0, 10**	**0, 10**	**2,8**	**1,9**	**1,9**	**2, 8**	**1, 8**	**3, 10**	**1, 2**	**0.5, 2.5**	**0.5, 2.5**
			(3'-4')		**(0-6")**	**(3'-4')**	**(3'-4')DUP**	**(0-6")**	**(3'-4')**	**(3'-4')DUP**	**(2'-4')**	**(3'-4')**	**(0-2')**	**(2-3')**	**(1'-2')**	**(3'-4')**
Date Sampled			5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/21/02	5/21/02	5/21/02	5/21/02
Dilution														1000		1000
	Units	**RL**												(Medium		(Medium
B-Tex														Level)		Level)
Benzene	**ug/kg**	**1250**												<1200		<1100
Ethyl benzene	**ug/kg**	**1250**												**45000**		**56000**
Toluene	**ug/kg**	**1250**												**12000**		**1700**
Xylene (total)	**ug/kg**	**1250**												<1200		<1100

Roy F Weston, Inc.												ACE Technologies, Inc.				
750 E Bunker Ct, Suite 500												1680 Lake Front Circle, Ste. B				
Vernon Hills, IL 60061												The Woodlands, TX 78130				
Tel: (847) 918-4041												Phone: (281) 363-2233				
Fax: (847) 918-4055												Fax : (281) 298-5784				
					PESTICIDED & PCB'S							Date:	6/5/02			
Attn: Mr. Rick Mehl/ Ms. Tonya Balla												Project Name: Calumet Container				
Episode #:			7913										7916			
Lab Sample ID			1	2	3	4	5	6	7	8	9	10	1	2	3	4
Weaton Sample ID			6, 7	SD-02	5, 6	0, 10	0, 10	2,8	1,9	1,9	2, 8	1, 8	3, 10	1, 2	0.5, 2.5	0.5, 2.5
			(3'-4')		(0-6")	(3'-4')	(3'-4')DUP	(0-6")	(3'-4')	(3'-4')DUP	(2'-4')	(3'-4')	(0-2')	(2-3')	(1'-2')	(3'-4')
Date Sampled			5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/21/02	5/21/02	5/21/02	5/21/02
	Units	RL														
Pesticides																
4,4`-DDD	ug/kg	3.3	<4.3								<4.6		<4.3			
4,4`-DDE	ug/kg	3.3	<4.3								50		<4.3			
4,4`-DDT	ug/kg	3.3	61								78		<4.3			
Aldrin	ug/kg	1.7	<2.2								<2.3		<2.2			
alpha-BHC	ug/kg	1.7	<2.2								<2.3		<2.2			
beta-BHC	ug/kg	1.7	<2.2								<2.3		<2.2			
Chlordane (Technical)	ug/kg	3.3	80								<4.6		17			
delta-BHC	ug/kg	1.7	<2.2								<2.3		<2.2			
Dieldrin	ug/kg	3.3	<4.3								<4.6		2.3			
Endosulfan II	ug/kg	3.3	<4.3								<4.6		<4.3			
Endosulfan sulfate	ug/kg	3.3	<4.3								<4.6		<4.3			
Endosulfan-I	ug/kg	1.7	26								<2.3		15			
Endrin	ug/kg	3.3	<4.3								<4.6		<4.3			
Endrin aldehyde	ug/kg	3.3	<4.3								<4.6		<4.3			
Endrin ketone	ug/kg	3.3	<4.3								<4.6		<4.3			
gamma-BHC	ug/kg	1.7	<2.2								<2.3		<2.2			
Heptachlor	ug/kg	1.7	<2.2								<2.3		<2.2			
Heptachlor epoxide	ug/kg	1.7	<2.2								<2.3		<2.2			
Methoxychlor	ug/kg	17	<22								<23		<22			
Toxaphene	ug/kg	33	<43								<46		<43			
PCB's																
Aroclor 1016	ug/kg	33	<43								<46		<43			
Aroclor 1221	ug/kg	33	<43								<46		<43			
Aroclor 1232	ug/kg	33	<43								<46		<43			
Aroclor 1242	ug/kg	33	<43								<46		<43			
Aroclor 1248	ug/kg	33	<43								<46		<43			
Aroclor 1254	ug/kg	33	<43								<46		<43			
Aroclor 1260	ug/kg	33	<43								<46		<43			

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The Woodlands, TX 78130
Phone: (281) 363-2233
Fax : (281) 298-5784

Date: 6/5/02

Attn: Mr. Rick Mehl/ Ms. Tonya Balla

Semi Volatiles

Project Name: Calumet Container

Episode #:			7913										7916			
Lab Sample ID			1	2	3	4	5	6	7	8	9	10	1	2	3	4
Weaton Sample ID			6, 7	SD-02	5, 6	0, 10	0, 10	2,8	1,9	1,9	2, 8	1, 8	3, 10	1, 2	0.5, 2.5	0.5, 2.5
			(3'-4')		(0-6")	(3'-4')	(3'-4')DUP	(0-6")	(3'-4')	(3'-4')DUP	(2'-4')	(3'-4')	(0-2')	(2-3')	(1'-2')	(3'-4')
Date Sampled			5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/21/02	5/21/02	5/21/02	5/21/02
Dilution			20								20		20			
	Units	RL														
SVOA 8270C																
1,2,4-Trichlorobenzene	UG/L	330	<8700								<9200		<8700			
1,2-Dichlorobenzene	UG/L	330	<8700								<9200		<8700			
1,3-Dichlorobenzene	UG/L	330	<8700								<9200		<8700			
1,4-Dichlorobenzene	UG/L	330	<8700								<9200		<8700			
2,2`-oxybis (1-Chloropropane)	UG/L	330	<8700								<9200		<8700			
2,4,5-Trichlorophenol	UG/L	830	<22000								<23000		<22000			
2,4,6-Trichlorophenol	UG/L	330	<8700								<9200		<8700			
2,4-Dichlorophenol	UG/L	330	<8700								<9200		<8700			
2,4-Dimethylphenol	UG/L	330	<8700								<9200		<8700			
2,4-Dinitrophenol	UG/L	830	<22000								<23000		<22000			
2,4-Dinitrotoluene	UG/L	330	<8700								<9200		<8700			
2,6-Dinitrotoluene	UG/L	330	<8700								<9200		<8700			
2-Chloronaphthalene	UG/L	330	<8700								<9200		<8700			
2-Chlorophenol	UG/L	330	<8700								<9200		<8700			
2-Methylnaphthalene	UG/L	330	<8700								<9200		<8700			
2-Methylphenol	UG/L	330	<8700								<9200		<8700			
2-Nitroaniline	UG/L	830	<22000								<23000		<22000			
2-Nitrophenol	UG/L	330	<8700								<9200		<8700			
3,3`-Dichlorobenzidine	UG/L	330	<8700								<9200		<8700			
3-Nitroaniline	UG/L	830	<22000								<23000		<22000			
4,6-Dinitro-2-methylphenol	UG/L	830	<22000								<23000		<22000			
4-Bromophenyl phenyl ether	UG/L	330	<8700								<9200		<8700			
4-Chloro-3-methylphenol	UG/L	330	<8700								<9200		<8700			
4-Chloroaniline	UG/L	330	<8700								<9200		<8700			
4-Chlorophenyl phenyl ether	UG/L	330	<8700								<9200		<8700			
4-Methylphenol	UG/L	330	<8700								<9200		<8700			
4-Nitroaniline	UG/L	830	<22000								<23000		<22000			
4-Nitrophenol	UG/L	830	<22000								<23000		<22000			
Acenaphthene	UG/L	330	<8700								<9200		<8700			
Acenaphthylene	UG/L	330	<8700								<9200		<8700			
Anthracene	UG/L	330	<8700								<9200		<8700			

Episode #:			7913										7916			
Lab Sample ID			1	2	[illegible]	4	5	6	7	8	9	10	1	2	3	4
Weaton Sample ID			6, 7	SD-02	5, 6	0, 10	0, 10	2,8	1,9	1,9	2, 8	1, 8	3, 10	1, 2	0.5, 2.5	0.5, 2.5
			(3'-4')		(0-6")	(3'-4')	(3'-4')DUP	(0-6")	(3'-4')	(3'-4')DUP	(2'-4')	(3'-4')	(0-2')	(2-3')	(1'-2')	(3'-4')
Date Sampled			5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/21/02	5/21/02	5/21/02	5/21/02
Dilution			20								20		20			
	Units	**RL**														
SVOA 8270C(Contd....)																
Benzo(a)anthracene	UG/L	330	<8700								<9200		<8700			
Benzo(a)pyrene	UG/L	330	<8700								<9200		<8700			
Benzo(b)fluoranthene	UG/L	330	<8700								<9200		<8700			
Benzo(g,h,i)perylene	UG/L	330	<8700								<9200		<8700			
Benzo(k)fluoranthene	UG/L	330	<8700								<9200		<8700			
Benzoic acid	UG/L	830	<22000								<23000		<22000			
Benzyl alcohol	UG/L	830	<22000								<23000		<22000			
Bis(2-chloroethoxy)methane	UG/L	330	<8700								<9200		<8700			
Bis(2-chloroethyl)ether	UG/L	330	<8700								<9200		<8700			
Bis(2-chloroisopropyl) ether	UG/L	330	<8700								<9200		<8700			
Bis(2-ethylhexyl)phthalate	UG/L	330	<8700								<9200		<8700			
Butylbenzylphthalate	UG/L	330	<8700								<9200		<8700			
Carbazole	UG/L	330	<8700								<9200		<8700			
Chrysene	UG/L	330	<8700								<9200		<8700			
Di-n-butylphthalate	UG/L	330	<8700								<9200		<8700			
Di-n-octylphthalate	UG/L	330	<8700								<9200		<8700			
Dibenzo(a,h)anthracene	UG/L	330	<8700								<9200		<8700			
Dibenzofuran	UG/L	330	<8700								<9200		<8700			
Diethylphthalate	UG/L	330	<8700								<9200		<8700			
Dimethylphthalate	UG/L	330	<8700								<9200		<8700			
Fluoranthene	UG/L	330	<8700								<9200		<8700			
Fluorene	UG/L	330	<8700								<9200		<8700			
Hexachlorobenzene	UG/L	330	<8700								<9200		<8700			
Hexachlorobutadiene	UG/L	330	<8700								<9200		<8700			
Hexachlorocyclopentadiene	UG/L	330	<8700								<9200		<8700			
Hexachloroethane	UG/L	330	<8700								<9200		<8700			
Indeno(1,2,3-c,d)pyrene	UG/L	330	<8700								<9200		<8700			
Isophorone	UG/L	330	<8700								<9200		<8700			
N-Nitroso-di-n-propylamine	UG/L	330	<8700								<9200		<8700			
N-Nitrosodimethylamine	UG/L	330	<8700								<9200		<8700			
N-Nitrosodiphenylamine	UG/L	330	<8700								<9200		<8700			
Naphthalene	UG/L	330	<8700								<9200		<8700			
Nitrobenzene	UG/L	330	<8700								<9200		<8700			
Pentachlorophenol	UG/L	830	<22000								<23000		<22000			
Phenanthrene	UG/L	330	<8700								<9200		<8700			
Phenol	UG/L	330	<8700								<9200		<8700			
Pyrene	UG/L	330	<8700								<9200		<8700			

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The Woodlands, TX 78130
Phone: (281) 363-2233
Fax : (281) 298-5784

Date: 6/5/02

Attn: Mr. Rick Mehl/ Ms. Tonya Balla

Metals

Project Name: Calumet Container

Episode #:			7913										7916			
Lab Sample ID			1	2	3	4	5	6	7	8	9	10	1	2	3	4
Weaton Sample ID			6, 7	SD-02	5, 6	0, 10	0, 10	2,8	1,9	1,9	2, 8	1, 8	3, 10	1, 2	0.5, 2.5	0.5, 2.5
			(3'-4')		(0-6")	(3'-4')	(3'-4')DUP	(0-6")	(3'-4')	(3'-4')DUP	(2'-4')	(3'-4')	(0-2')	(2-3')	(1'-2')	(3'-4')
Date Sampled			5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/20/02	5/21/02	5/21/02	5/21/02	5/21/02
	Units	RL														
TAL Metals									640	660	1500	900	3400			
Aluminum,Total	mg/kg	6.7	5200						<3.9	<4	<4	<3.9	<4			
Antimony, Total	mg/kg	4	8.6						2.11	2.06	21.5	4.36	13.5			
Arsenic, Total	mg/kg	0.667	6.86						3.9	3.8	45	14	280			
Barium, Total	mg/kg	0.67	610						<0.329	<0.333	<0.331	<0.329	0.38			
Beryllium, Total	mg/kg	0.333	1.06						<0.329	<0.333	0.662	<0.329	0.637			
Cadmium, Total	mg/kg	0.333	4.12						21000	22000	6300	2000	27000			
Calcium, Total	mg/kg	67	32000						2.7	2.9	4.5	3.1	20			
Chromium, Total	mg/kg	0.67	210						1.5	1.4	2.1	1	3.5			
Cobalt, Total	mg/kg	0.67	9.4						2.2	2.4	37	4.8	27			
Copper, Total	mg/kg	1.3	190						2000	2100	12000	2800	19000			
Iron, Total	mg/kg	6.7	8200						3.73	3.36	51.8	5.85	161			
Lead, Total	mg/kg	0.667	1320	47.7	280	2.8	3.15	155	13000	13000	1400	680	4300	1490	6520	
Magnesium, Total	mg/kg	67	9400						91	93	91	20	1300			
Manganese, Total	mg/kg	0.67	840						<0.03	<0.03	0.06	<0.03	0.11			
Mercury, Total	mg/kg	0.03	.58						2.8	2.9	9	3.3	14			
Nickel, Total	mg/kg	1.3	9.8						130	130	160	120	350			
Potassium, Total	mg/kg	67	640						<0.461	<0.467	0.559	<0.461	<.467			
Selenium, Total	mg/kg	0.467	<0.464						<0.33	<0.33	<0.33	<0.33	<.33			
Silver, Total	mg/kg	0.33	1.6						75	72	<66	<66	190			
Sodium, Total	mg/kg	67	400						<0.329	<0.333	1.09	<0.329	2.16			
Thallium, Total	mg/kg	0.333	<0.331						2.9	2.8	7.1	4.3	13			
Vanadium, Total	mg/kg	0.67	10						10	9.8	160	16	530			
Zinc, Total	mg/kg	1.3	680													

Chain of Custody Record

PDP Analytical Services
1680 Lake Front Circle, Suite B ▪ The Woodlands, Texas 77380 ▪ Phone (281) 363-2233 ▪ Fax (281) 298-5784

Client Name / Address: WESTON, Inc., 750 E Bunker Ct, Suite 500, Vernon Hills, IL 60061

Send Report to: RICK MEHL / LINDA KOROBKA

Client Phone #: 847-918-4041

Client Fax #: 847-918-4055

Project Number: ~~12654~~ HS 0222

Project Name: Calumet Container

Samplers (Signature): [signature]

P.O. Number:

Sample Identification	Date	Time	Comp.	Grab	Number of Containers	Matrix	Total Lead	TAL Metals	PCB / PEST	SVOC	VOC	Soil Moisture	Remarks
~~6,7~~ HS	~~5/20/02~~ HS			~~X~~		~~Soil~~ HS							
6,7 (3'-4')	5/20/02	10:10		X	5	Soil		✓	✓	✓	✓	✓	7913.001
SD-02	5/20/02	09:20		X	1	Soil	✓						.002
5,6 (0-6")	5/20/02	11:20		X	1	Soil	✓						.003
0,10 (3'-4')	5/20/02	11:50		X	1	Soil	✓						.004
0,10 (3'-4') DUP	5/20/02	11:50		X	1	Soil	✓						.005
2.8 (0-6")	5/20/02	14:45		X	1	Soil	✓						.006
1,9 (3'-4')	5/20/02	11:35		X	1	Soil		✓					.007
1,9 (3'-4') DUP	5/20/02	11:35		X	1	Soil		✓					.008
2.8 (2'-4')	5/20/02	14:45		X	5	Soil		✓	✓	✓	✓	✓	.009
1.8 (3'-4')	5/20/02	1500		X	1	Soil		✓					.010

Relinquished by (Signature)	Date / Time	Received by (Signature)	Date / Time
[signature]	5-20-02 16:30		
Relinquished by (Signature)	Date / Time	Received by (Signature)	Date / Time
		[signature]	
Relinquished by (Signature)	Date / Time	Received for Laboratory by (Signature)	Date / Time
		[signature]	5/21/02 17:00

Remarks:

Method of Shipment:

PDP Quote Number:

Distribution: Original accompanies shipment; Copy to coordinator and field files

1007

Chain of Custody Record

PDP Analytical Services
1680 Lake Front Circle, Suite B ▪ The Woodlands, Texas 77380 ▪ Phone (281) 363-2233 ▪ Fax (281) 298-5784

Client Name / Address: Rot F WESTON, Inc. 750E Bunker Ct, Suite 500 Vernon Hills IL 60061

Send Report to: Rick Mehl / Linda Korobka

Client Phone #: 847/918-4000

Client Fax #: 847/918-4055

Project Number: ~~0220~~ 0222

Project Name: Calumet Container

Samplers (Signature):

P.O. Number:

Sample Identification	Date	Time	Comp.	Grab	Number of Containers	Matrix	VOC	SVOC	TAL Metals	PCB/PEST	Total Pb	BTEX	Remarks
3, 10 (0-2')	5/21/02	0815		X	1	soil	X	X	X	X			7916.001
1, 2 (2'-3')	↓	1345		↓	4	↓					X	X	1002
0.5, 2.5 (1'-2')		1400			1						X		1003
0.5, 2.5 (3'-4')		1400			3							X	1004

Relinquished by (Signature)	Date / Time	Received by (Signature)	Date / Time
	5/21/02 16:45		5/22/02 [illegible]
Relinquished by (Signature)	Date / Time	Received by (Signature)	Date / Time
Relinquished by (Signature)	Date / Time	Received for Laboratory by (Signature)	Date / Time

Remarks:

Method of Shipment:

PDP Quote Number:

Distribution: Original accompanies shipment; Copy to coordinator and field files

00008

APPENDIX E

SADA EXTENT OF CONTAMINATION PLOTS

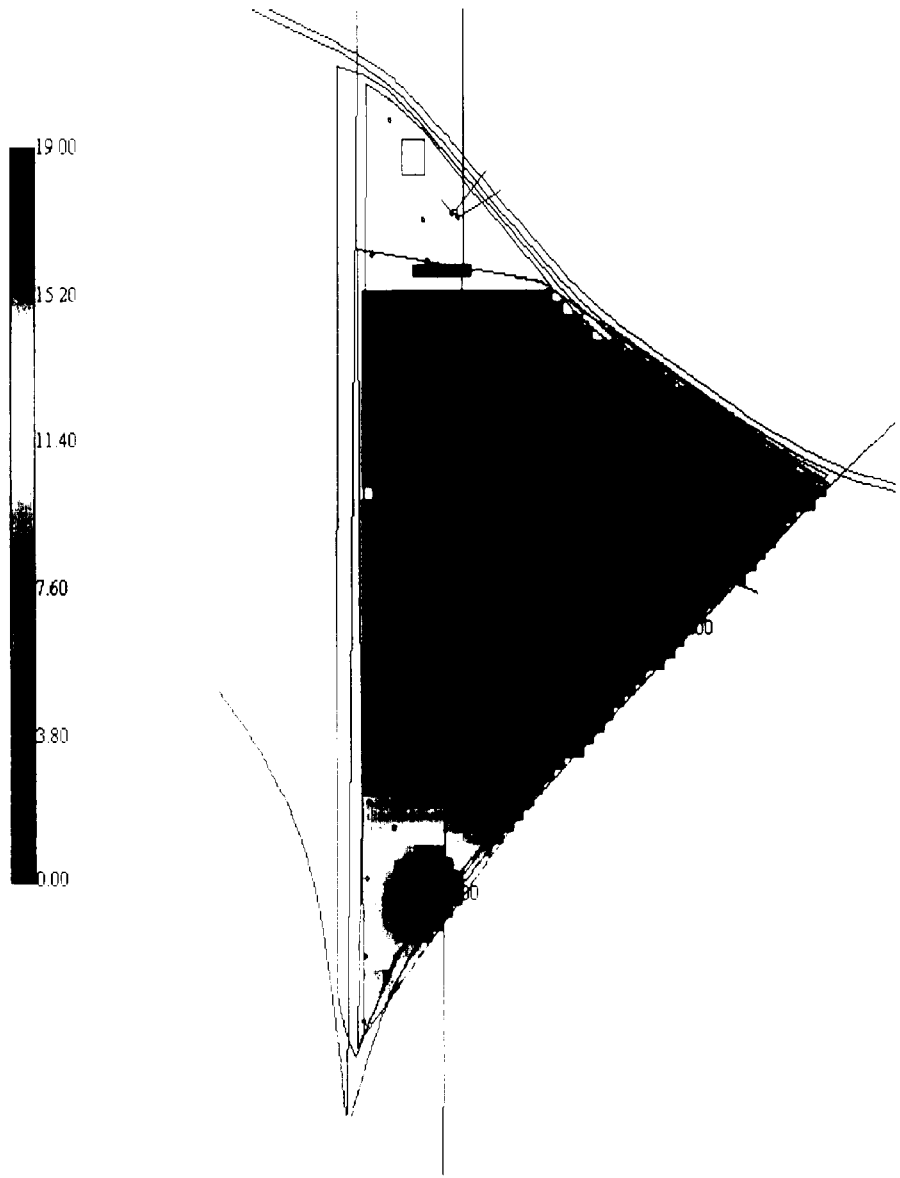
Calumet Container Site

SADA Plot Extent of Contamination:

Arsenic (mg/kg)

Calumet Container Site
SADA Plot
Extent of Contamination:

Benzene (ug/kg)



Calumet Container Site

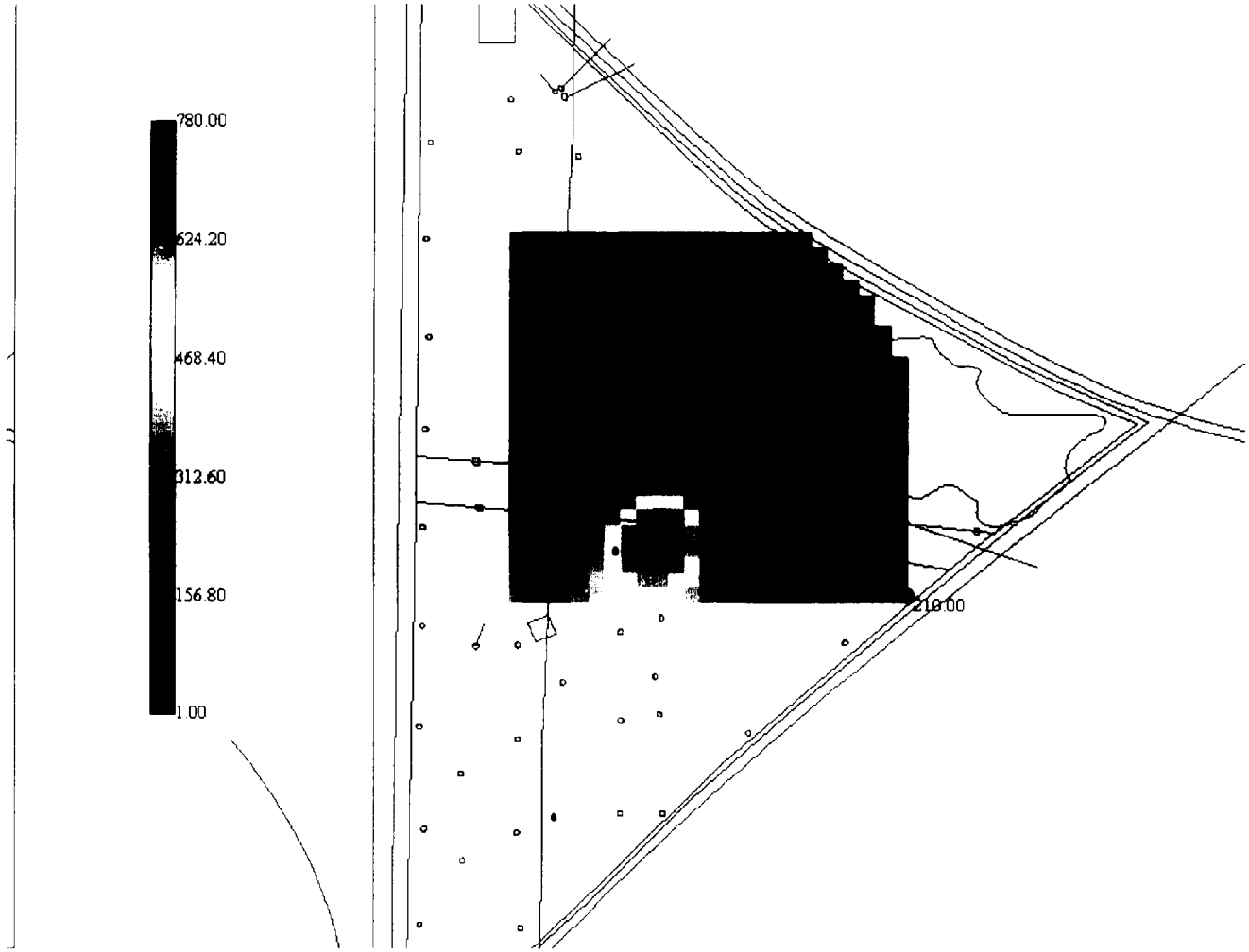
SADA Plot Extent of Contamination:

Cadmium (mg/kg)

Calumet Container Site

SADA Plot Extent of Contamination:

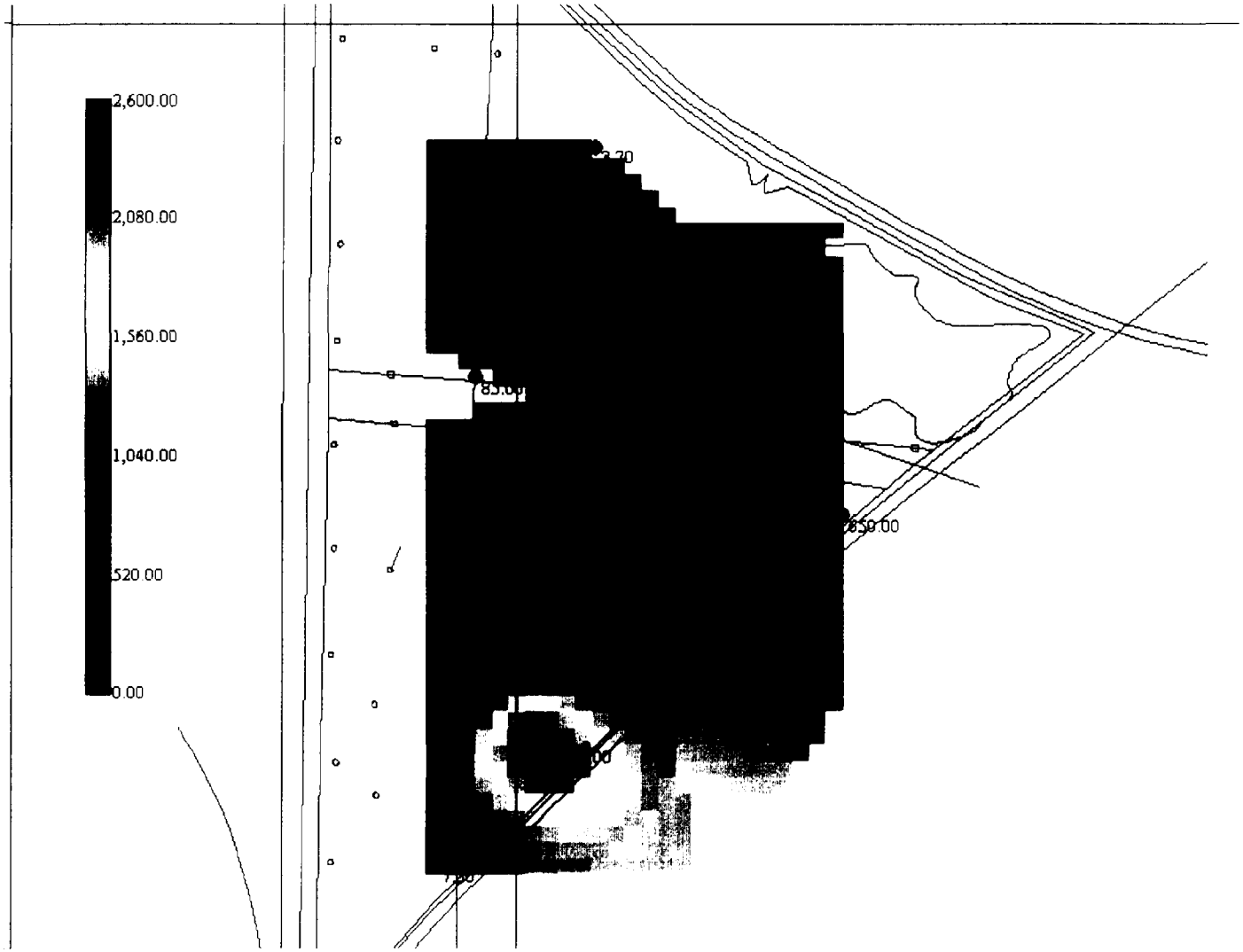
Chromium (ug/kg)



Calumet Container Site

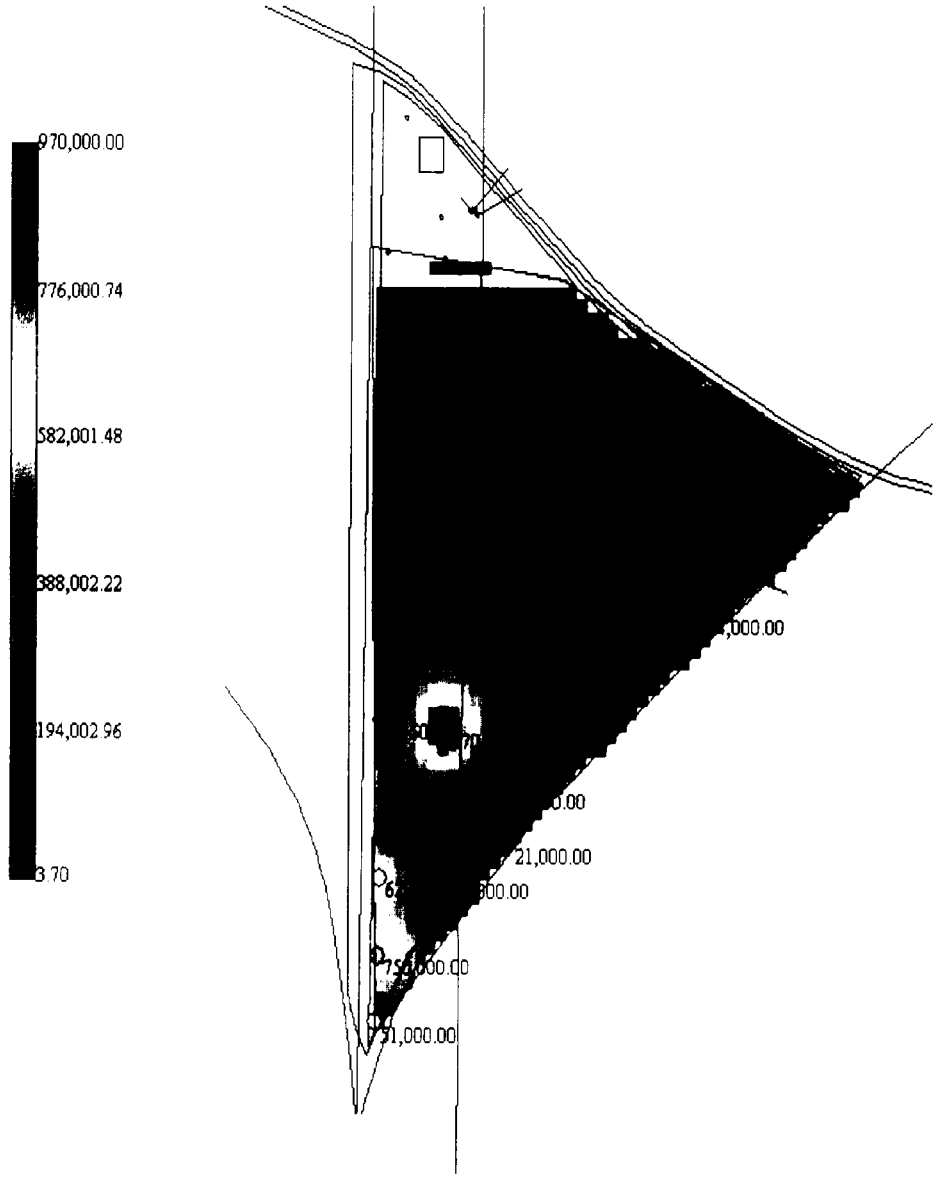
SADA Plot Extent of Contamination:

1,2 Dichlorpropane (ug/kg)



Calumet Container Site
SADA Plot
Extent of Contamination:

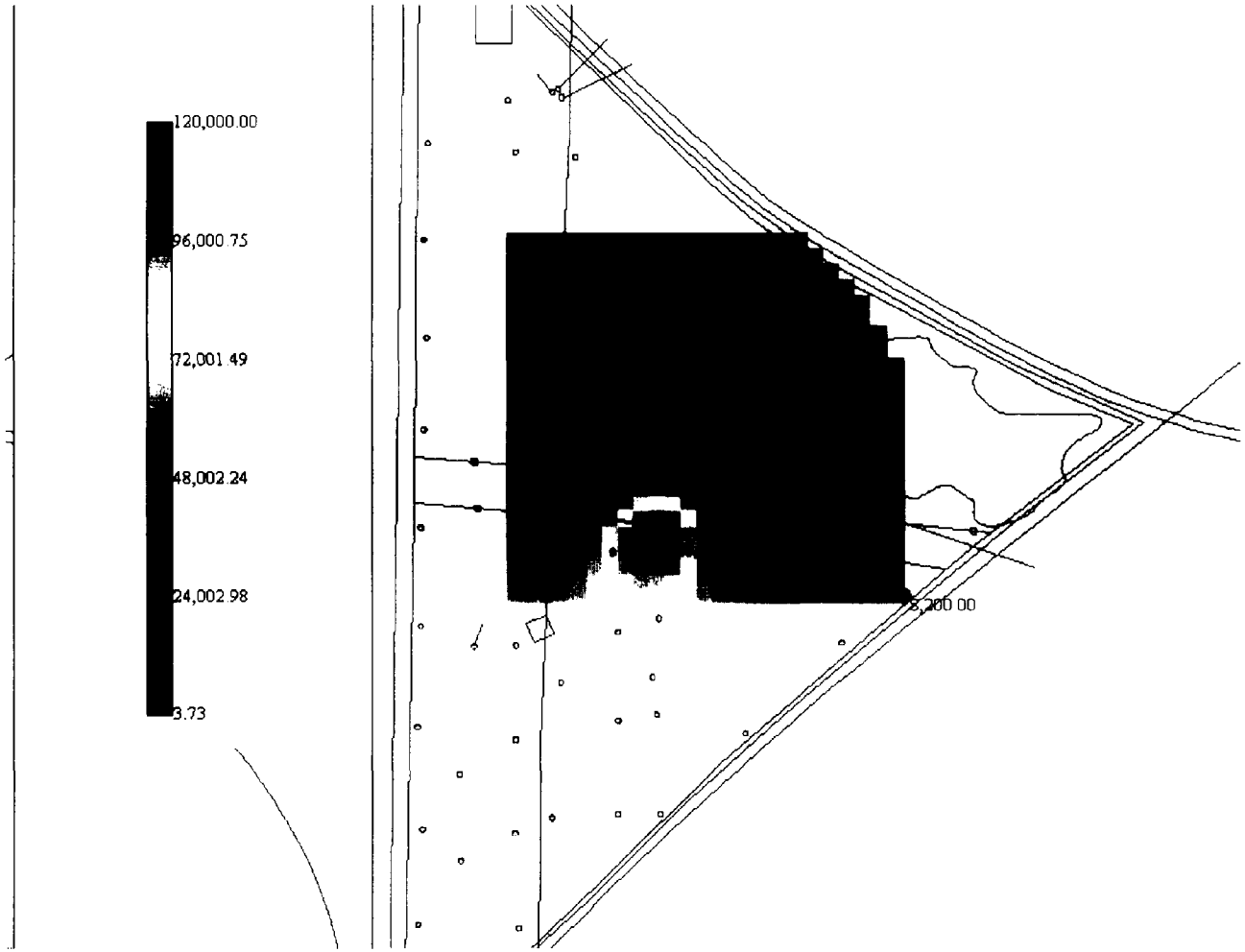
Ethylbenzene (ug/kg)



Calumet Container Site

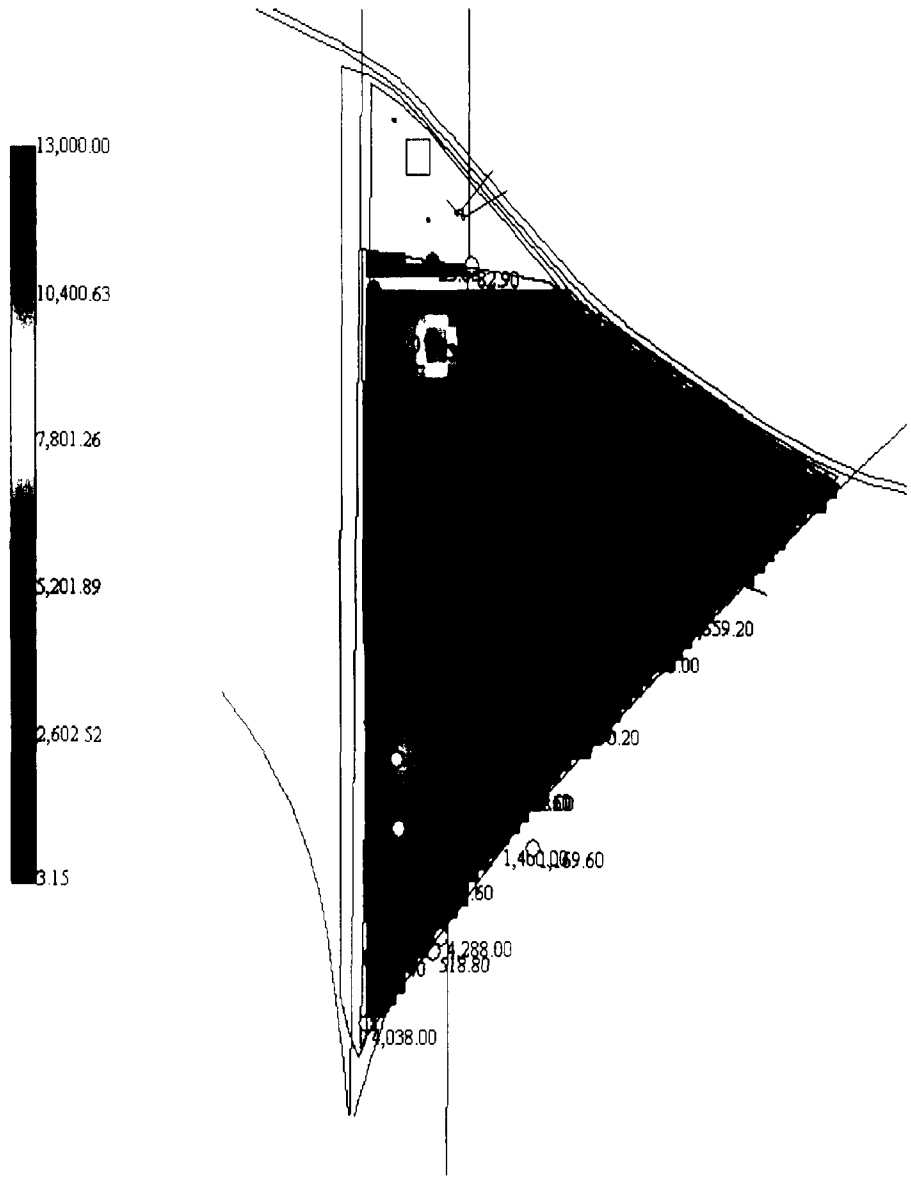
SADA Plot
Extent of
Contamination:

Iron (mg/kg)



Calumet Container Site
SADA Plot
Extent of Contamination:

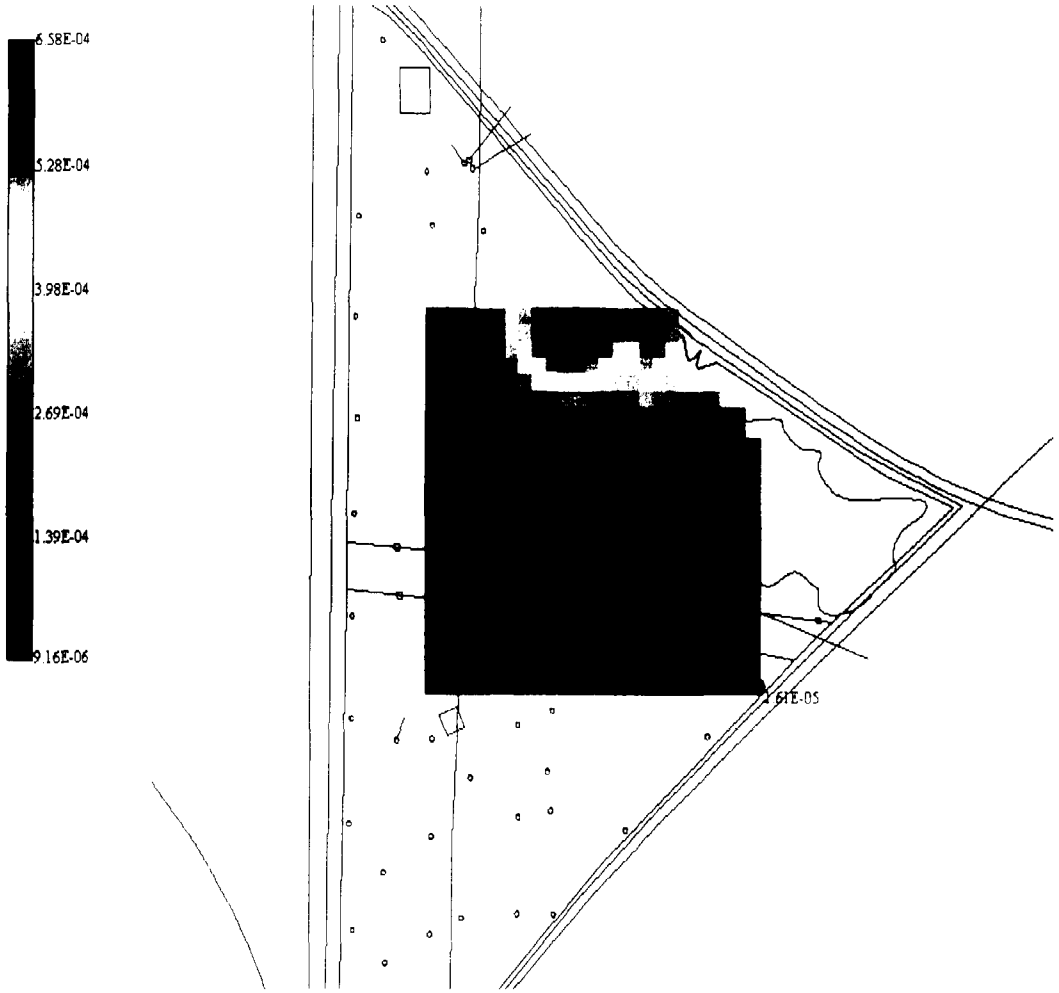
Lead (mg/kg)



Calumet Container Site

SADA Plot
Human Health Risk:

Arsenic (Residential/
Carcinogen/ Ingestion
risk index)



Calumet Container Site

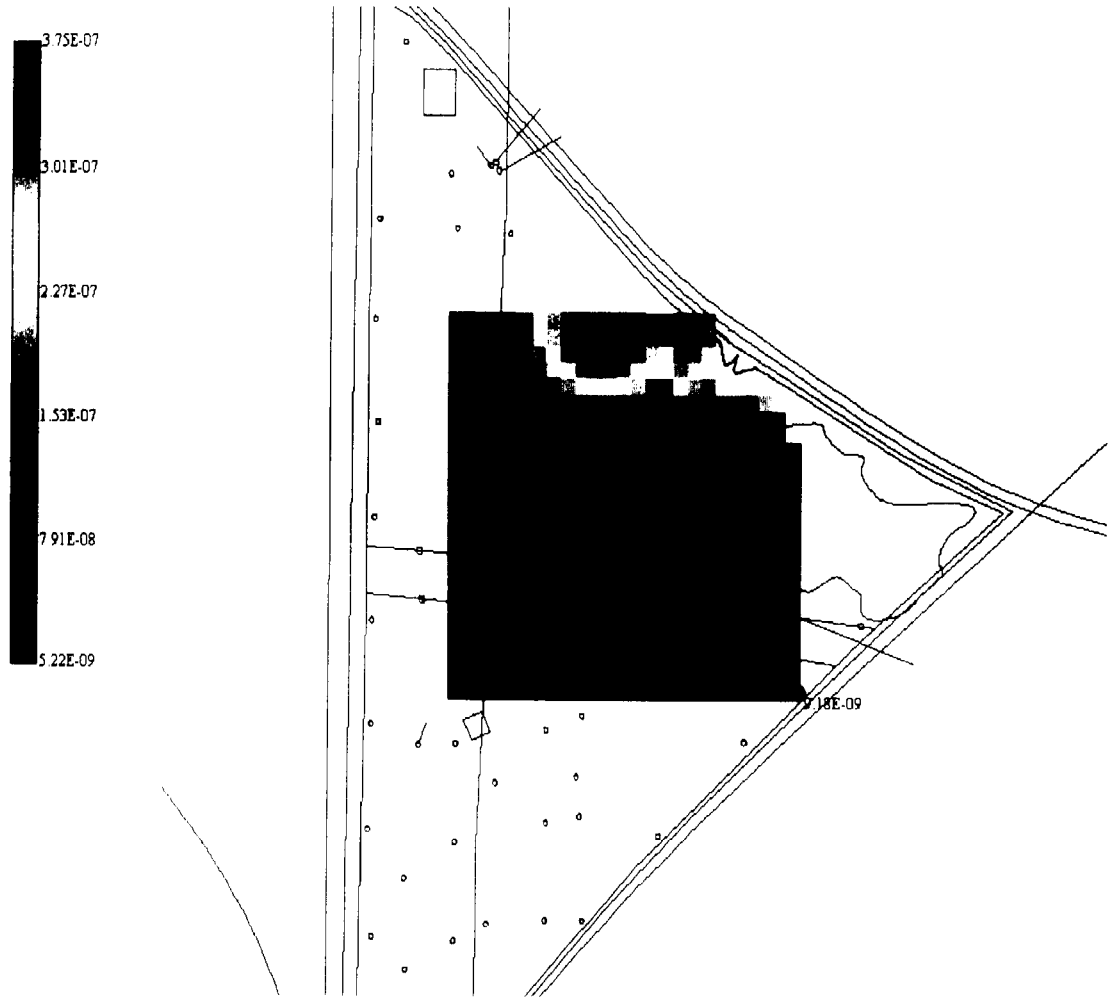
SADA Plot
Human Health Risk:

Arsenic (Residential/ NonCarcinogen/ Ingestion risk index)

Calumet Container Site

SADA Plot
Human Health Risk:

Arsenic
(Residential/
Carcinogen/
Inhalation risk
index)



Calumet Container Site

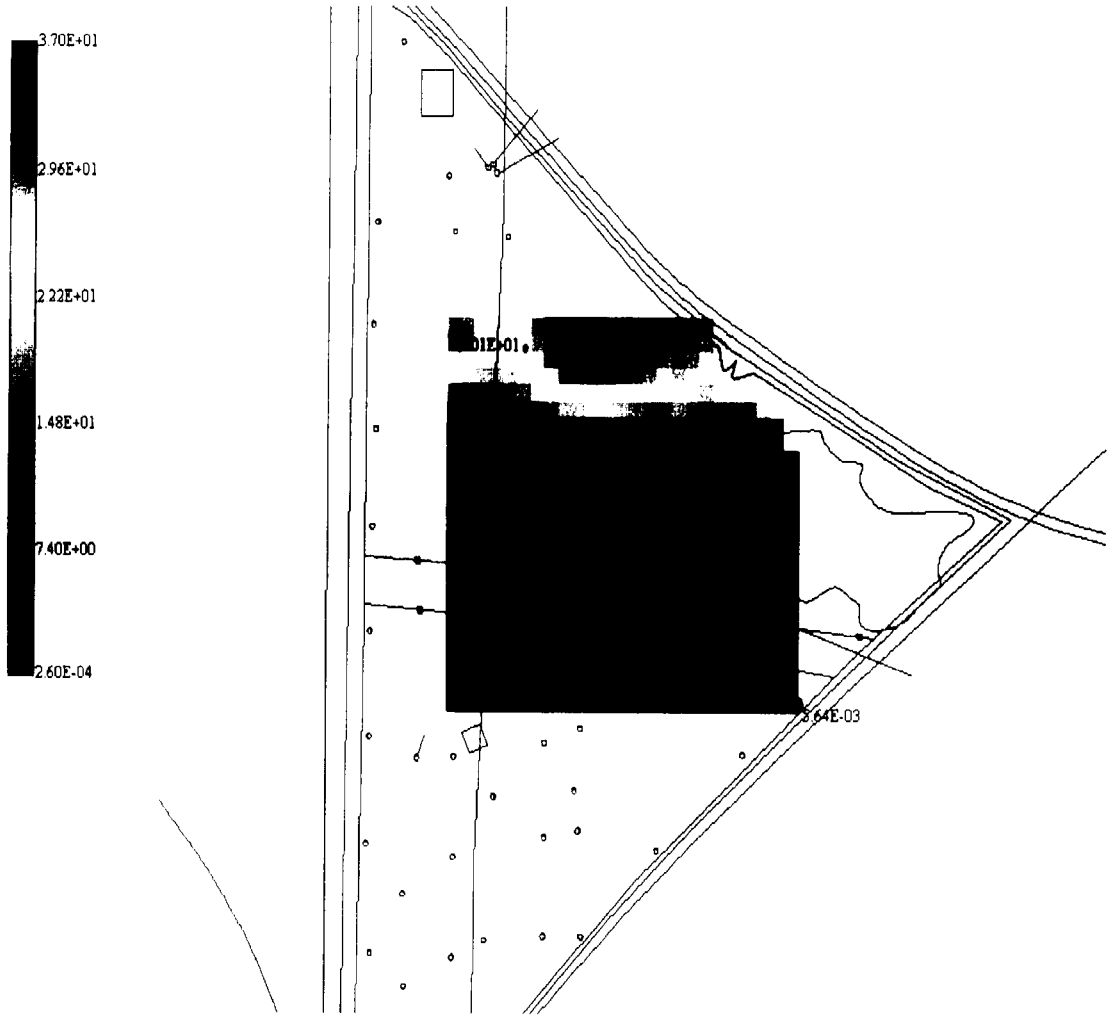
SADA Plot
Human Health Risk:

Cadmium (Residential/
Carcinogen/ Inhalation
risk index)

Calumet Container Site

SADA Plot
Human Health Risk:

Cadmium (Residential/
Noncarcinogen/
Ingestion risk index)



Calumet Container Site

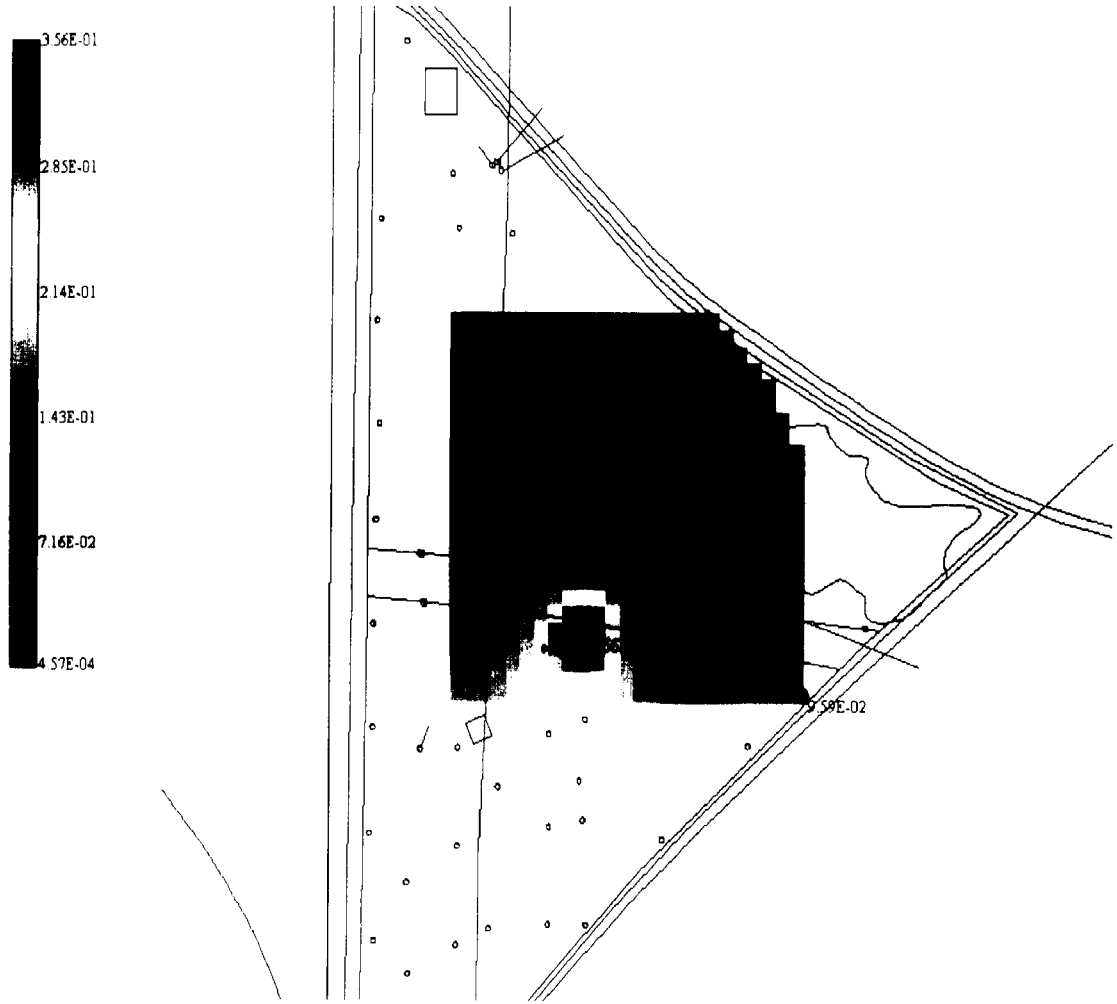
SADA Plot
Human Health Risk:

Chromium (Residential/ Carcinogen/ Inhalation risk index)

Calumet Container Site

SADA Plot
Human Health Risk:

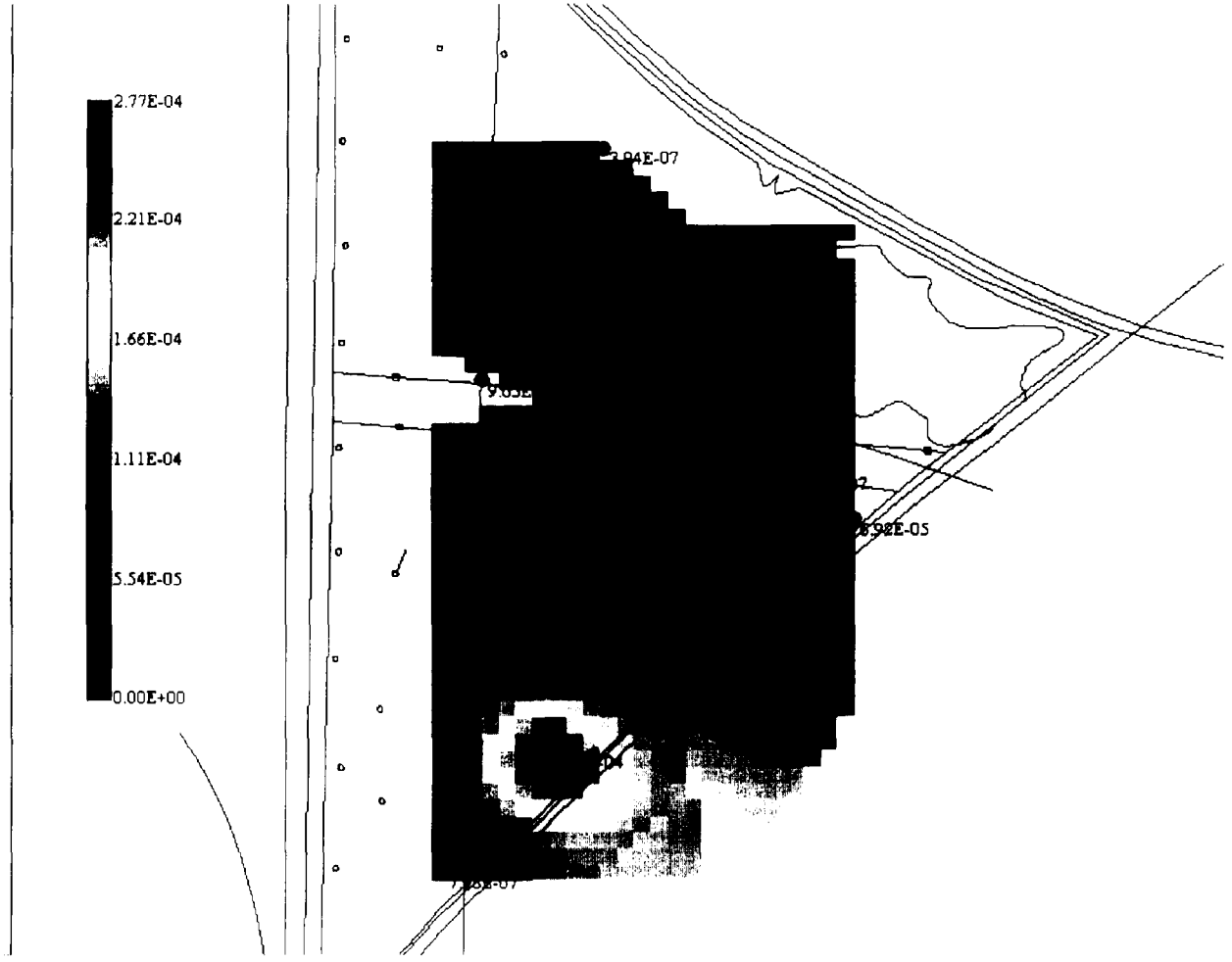
Chromium
(Residential/
Noncarcinogen/
Ingestion risk index)



Calumet Container Site

SADA Plot
Human Health Risk:

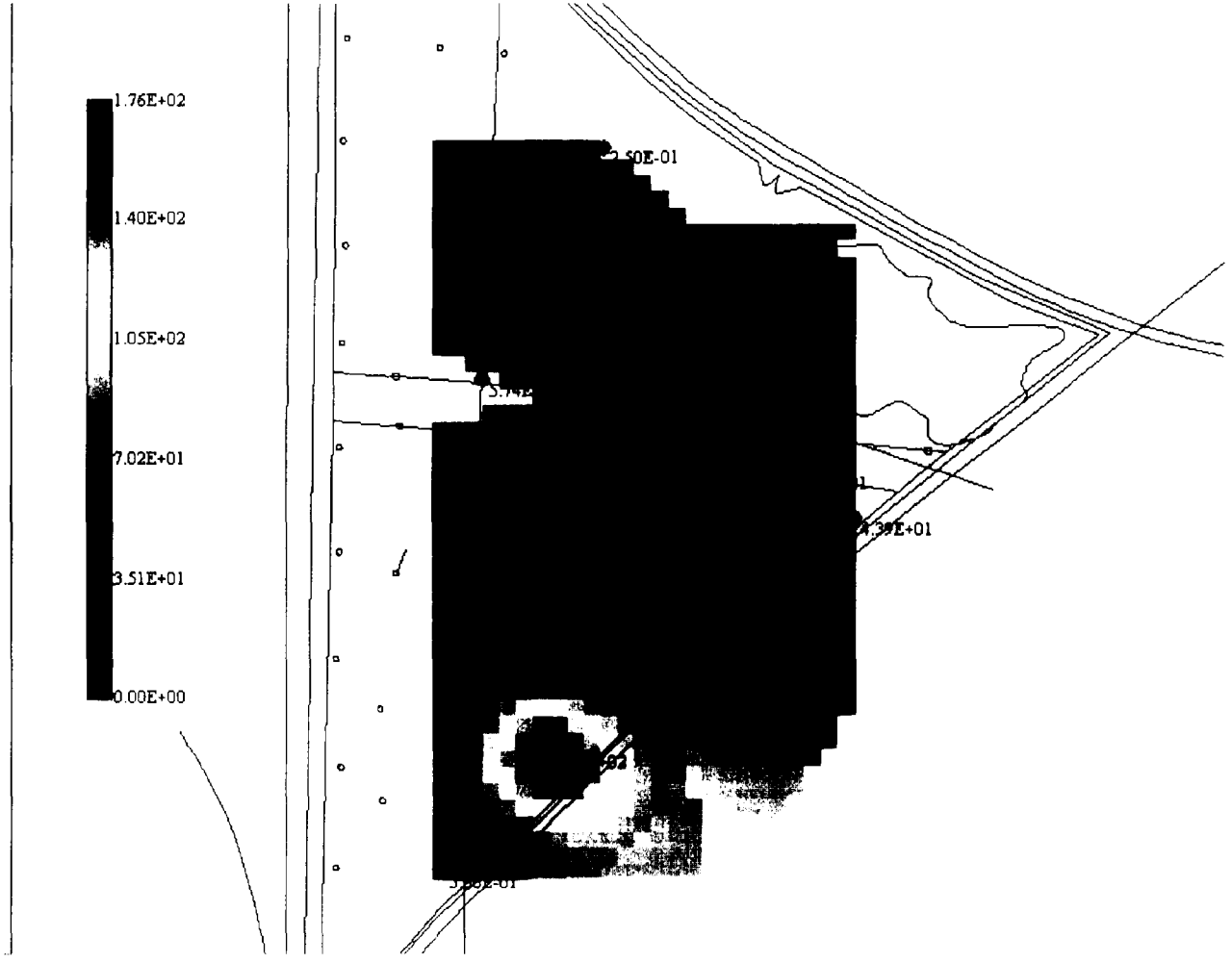
1,2 Dichlorpropane
(Residential/
Carcinogen/ Ingestion
risk index)



Calumet Container Site

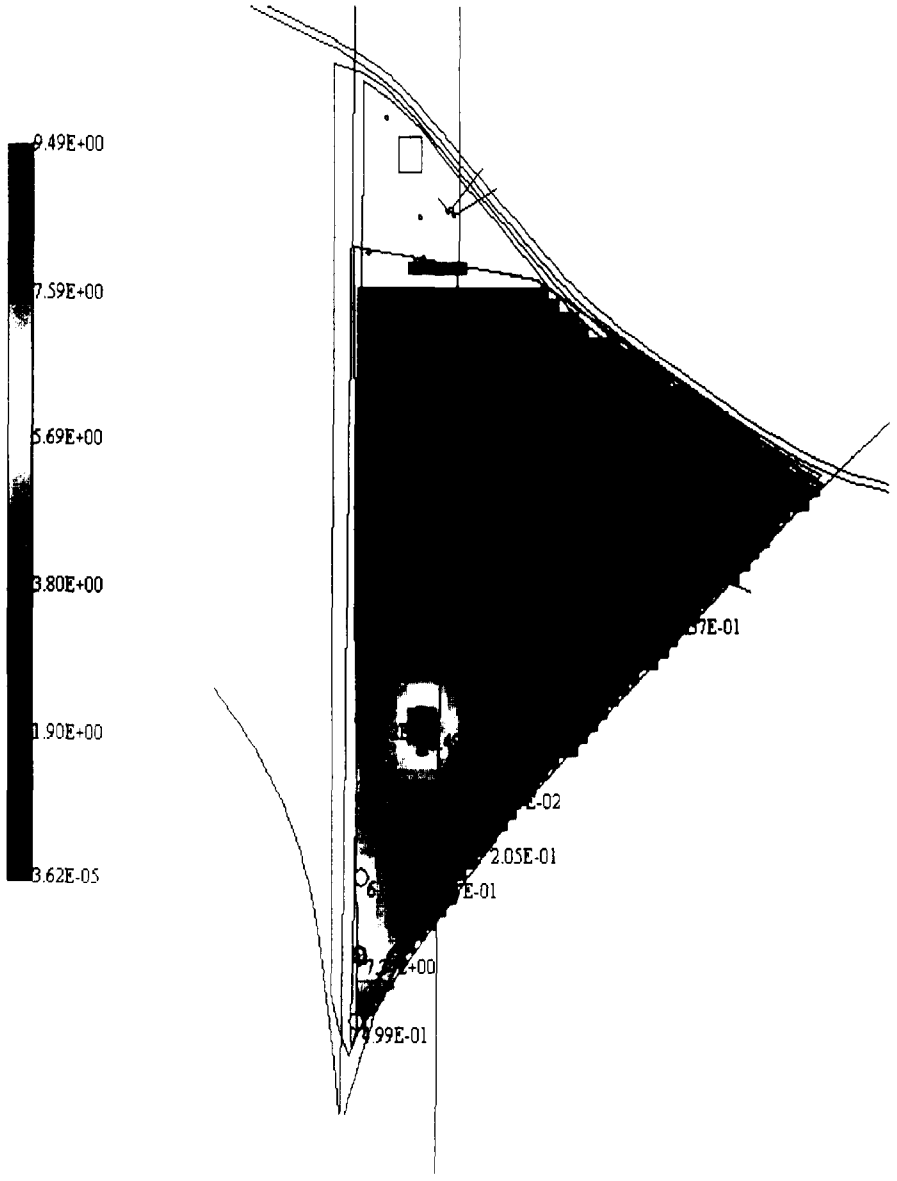
SADA Plot
Human Health Risk:

1,2 Dichlorpropane
(Residential/
Noncarcinogen/
Inhalation risk index)



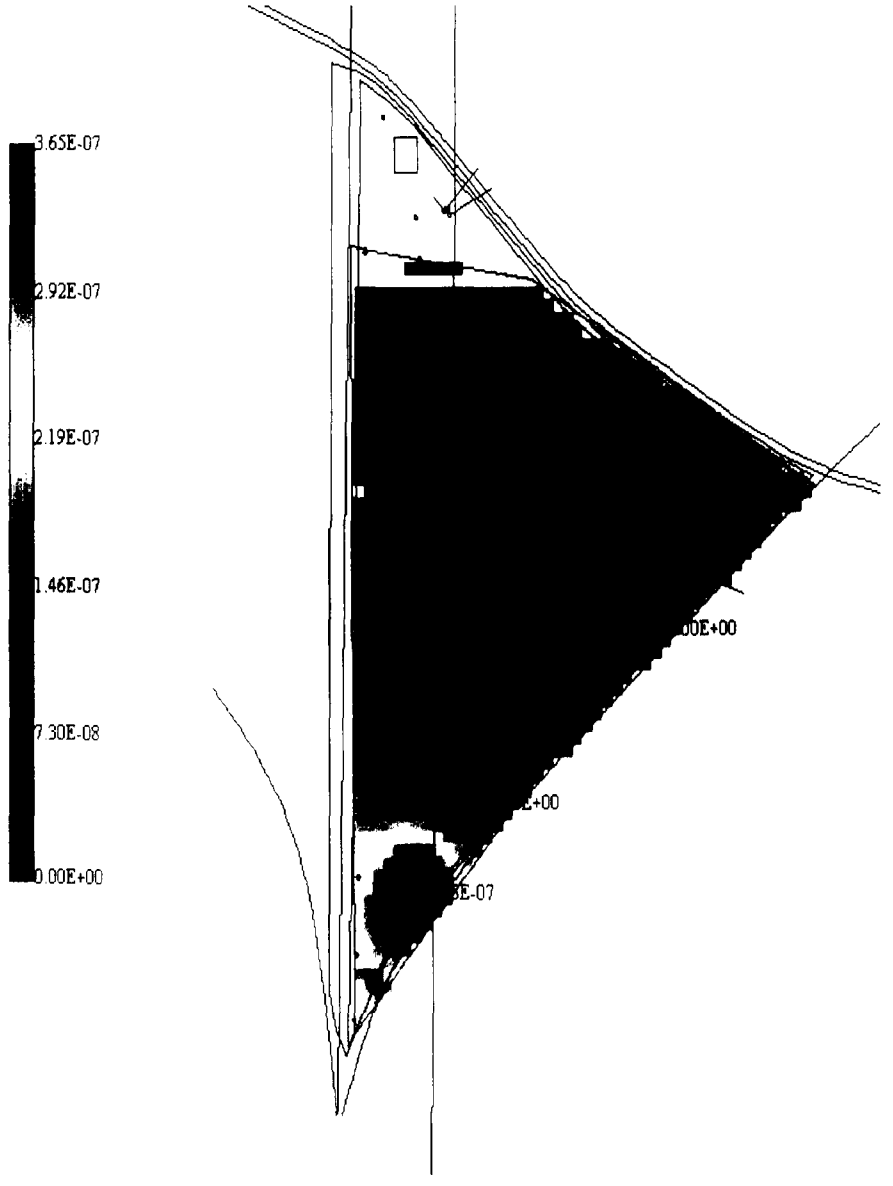
Calumet Container Site
SADA Plot
Human Health Risk:

Ethylbenzene (Residential/Non-Carcinogenic/Ingestion risk index)



Calumet Container Site
SADA Plot
Human Health Risk:

Benzene
(Residential/Carcinogenic/Ingestion
risk index)

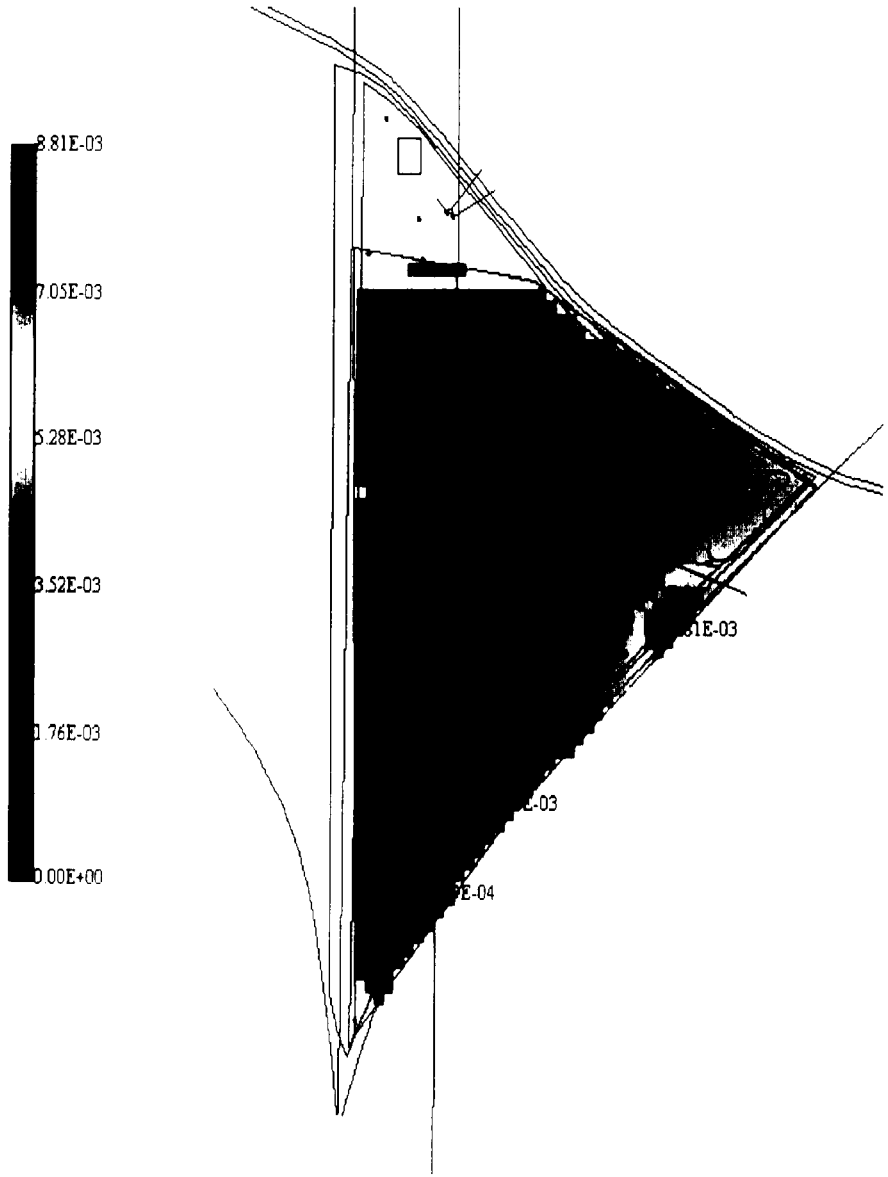


Calumet Container Site
SADA Plot
Human Health Risk:

m-p Xylene (Residential/Non-Carcinogenic/Ingestion risk index)

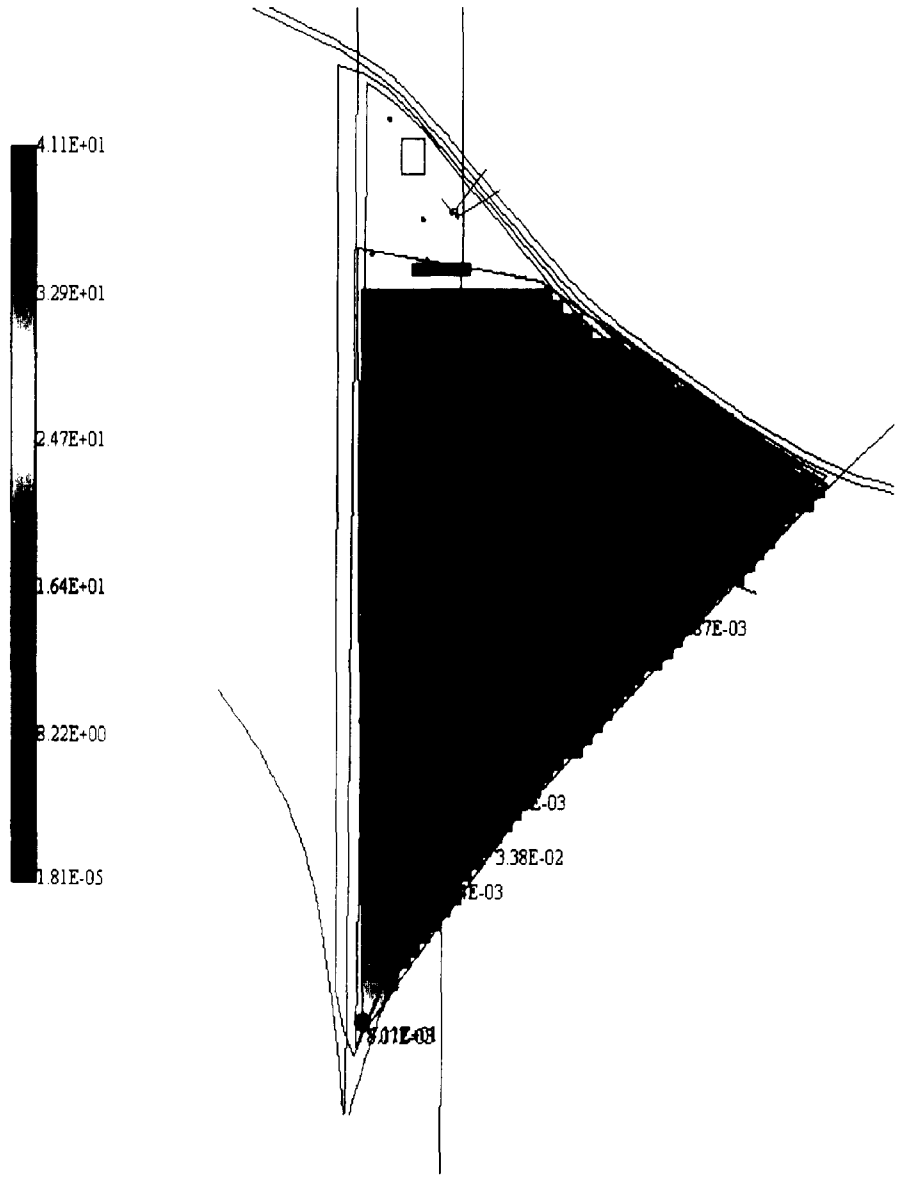
Calumet Container Site
SADA Plot
Human Health Risk:

o-Xylene (Residential/Non-Carcinogenic/Ingestion risk index)



Calumet Container Site
SADA Plot
Human Health Risk:

Toluene (Residential/Non-Carcinogenic/Ingestion risk index)

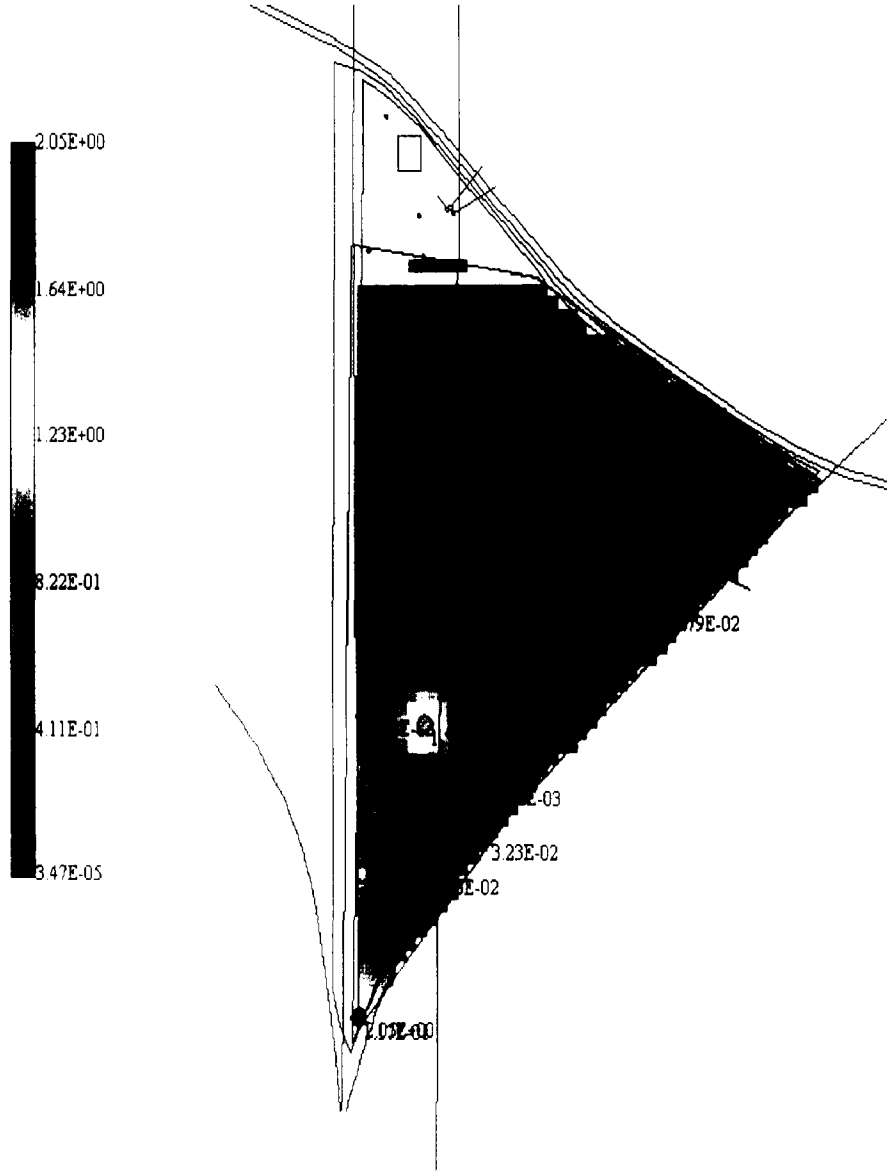


APPENDIX F

SADA HUMAN HEALTH RISK PLOTS

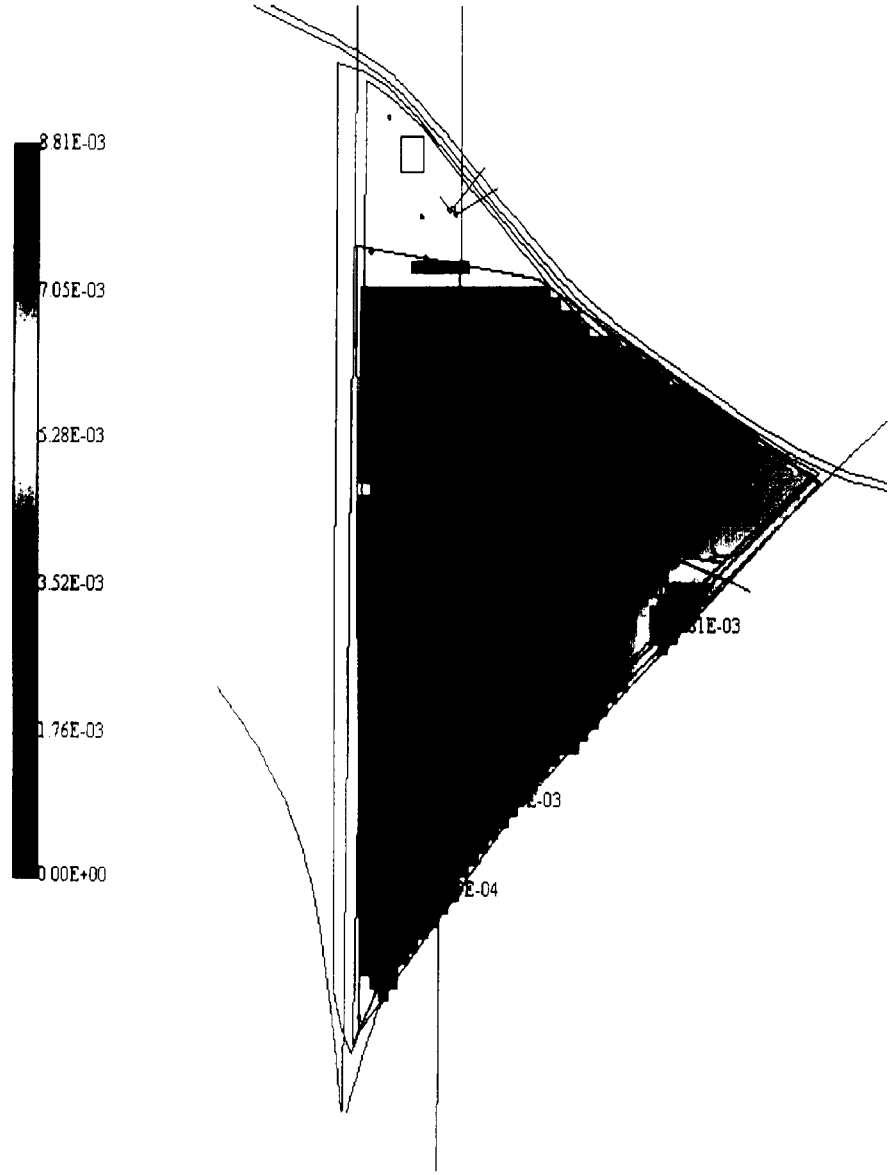
Calumet Container Site
SADA Plot
Human Health Risk:

m-p Xylene (Residential/Non-Carcinogenic/Ingestion risk index)



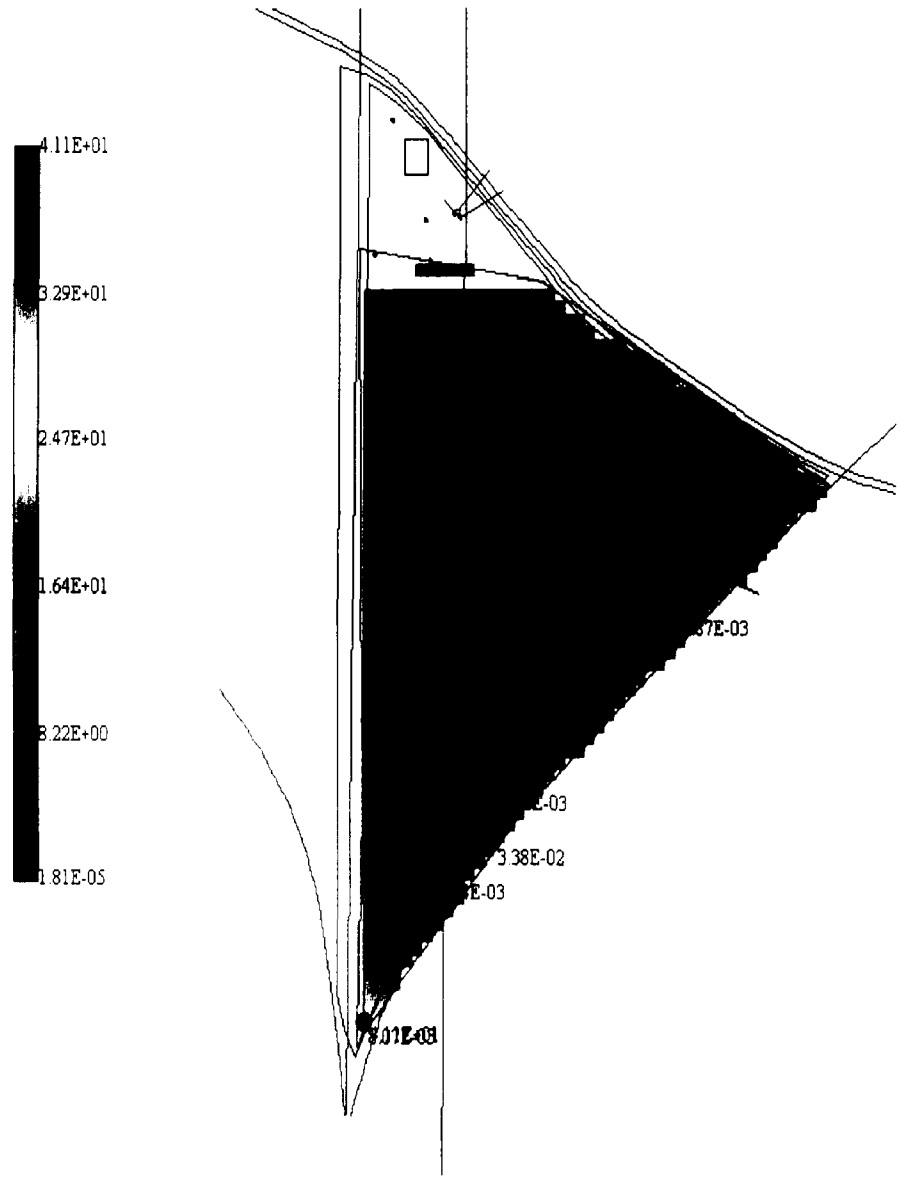
Calumet Container Site
SADA Plot
Human Health Risk:

o-Xylene (Residential/Non-Carcinogenic/Ingestion risk index)



Calumet Container Site
SADA Plot
Human Health Risk:

Toluene (Residential/Non-Carcinogenic/Ingestion risk index)



APPENDIX G

SADA HUMAN HEALTH DOCUMENTATION

(*Spatial Analysis and Decision Assistance (SADA) Version 2.3 User Guide.* **January 2002.**
http://www.tiem.utk.edu/~sada/).

In SADA, four land use scenarios are considered: residential, recreational, industrial, and agricultural. The exposure pathways are grouped by soil-based exposure pathways (soil, and sediment) and by water-based exposure pathways (surface water and groundwater). The tables presented for each pathway list the default values that are in SADA. They can be changed by the user as needed to reflect updated guidance or site-specific conditions.

1 Land Use Scenarios

The four land use scenarios considered in SADA are future unrestricted industrial, residential, recreational, and agricultural exposures. The purpose of evaluating future land use scenarios as part of the risk assessment is to establish whether remedial action is necessary for alternate land uses by determining if the cumulative risk or hazard index from the source areas could exceed levels of concern. The future land use scenarios are based on the assumption that unrestricted industrial workers, residents, farmers, or recreational users of the area could be exposed. Current contaminant concentrations are used for the on-site assessment of future exposure. This represents a maximum exposure to contaminants in the area and will serve to define the potential human health risks that would exist if residential, unrestricted industrial, or recreational occupation were to begin within a short time frame.

Under the industrial scenario, industrial workers are expected to be routinely exposed to contaminated media within a commercial area or industrial site. The future industrial scenario is evaluated using industrial default occupational values provided in EPA. Pathways are evaluated for exposures to surface soil, sediment, and surface water. The exposures are based on the potential for the use of heavy equipment and related traffic in and around the contaminated soil and sediment in an unrestricted industrial scenario. Therefore, soils and sediment could be disturbed, thereby producing particulate emissions which could then be inhaled by the industrial worker. It should be noted that the assumptions and default parameters for the industrial land use scenario do not reflect the use of protective clothing or other safety precautions. The drinking water pathway to surface water (based on 1 L/day ingestion) is also evaluated for future industrial land use, though it is unlikely.

Under the residential land use scenario, future residents are expected to be in frequent, repeated contact with contaminated media. The assumptions in this scenario account for daily exposure over the long term and generally result in the highest potential exposures and risk. In an industrial area where redevelopment for homes is not feasible now or in the foreseeable future, future land use planning scenarios would be more accurately reflected as industrial rather than residential. However, to provide a conservative assessment of risk, a residential land use scenario is assumed as one of the potential receptors for this assessment. Consequently, appropriate default parameters and equations for residential land use were evaluated.

Under the residential land use scenario, residents are expected to be continuously exposed to contaminated media. Exposure is higher than that under the industrial scenarios because exposure is more frequent and lasts for a longer duration of time. Exposure is calculated for a lifetime, which includes exposures for the receptor as both child and adult. Pathways are evaluated for exposures to surface soil, sediment, and surface water.

The recreational scenario addresses exposure to children and adults who spend a limited amount of time at or near the site while engaging in outdoor activities. The recreational land use scenario is also referred to as the "trespasser" or "site visitor" scenario. Pathways are evaluated for exposures to surface

soil, sediment, and surface water.

The agricultural scenario assumes a resident is also exposed to homegrown farm products. Exposure routes considered in addition to the residential pathways include the consumption of vegetables, the consumption of whole milk, and the consumption of beef.

2 Soil/ Sediment Exposure Pathways

Exposure pathways evaluated for soil and sediment include incidental ingestion, inhalation, dermal contact, and agricultural pathways.

2.1 Incidental Soil/Sediment Ingestion

The incidental ingestion of soil is a potentially significant source of exposure. Equation 1(non-radionuclides), Equation 2 (radionuclides), and Table 1 present the exposure variables for the soil/sediment ingestion pathway for the residential, industrial, recreational, and agricultural scenarios. The potential for exposure to children is greater due to behavioral patterns present during childhood. The higher value for children under the non-industrial scenarios are based on fecal tracer studies and account for the ingestion of both indoor and outdoor dust.

$$Nonrad\ Intake_{ing} = \frac{C_{sn}\ CF_1\ EF\ FI\ ED\ IR_{a,c}}{CF_2\ BW_{a,c}\ AT} \qquad \text{Eq. 1}$$

$$Rad\ Intake_{ing} = C_{sr}\ CF_8\ EF\ FI\ ED\ IR \qquad \text{Eq. 2}$$

Table 1. Soil/Sediment Ingestion Parameters

Parameter	Units	Residential	Industrial	Recreational	Agricultural
Non-radionuclide chemical concentration in soil = C_{sn}	mg/kg	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Radionuclide chemical concentration in soil = C_{sr}	pCi/g	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Conversion factor = CF_1	kg/mg	10^{-6}	10^{-6}	10^{-6}	10^{-6}
Exposure frequency = **EF**	days/yr	350 (EPA 1989a)	250 (EPA 1991a)	40 (EPA 1992)	350 (EPA 1989a)
Fraction ingested = **FI**	unitless	1	1	1	1
Exposure duration = **ED**	years	24 (adult) 6 (child) (EPA 1989a)	25 (adult) (EPA 1991a)	24 (adult) 6 (child) (EPA 1989a)	24 (adult) 6 (child) (EPA 1989a)
Conversion factor = CF_8	g/mg	10^{-3}	10^{-3}	10^{-3}	10^{-3}
Ingestion rate of soil = **IR**	mg/d	100 (adult) 200 (child) (EPA 1989a)	200 (adult) (EPA 1989a)	100 (adult) 200 (child) (EPA 1989a)	100 (adult) 200 (child) (EPA 1989a)

Body weight = **BW**	kg	70 (adult) 15 (child) (EPA 1991a)	70 (adult) (EPA 1991a)	70 (adult) 15 (child) (EPA 1991a)	70 (adult) 15 (child) (EPA 1991a)
Conversion Factor = CF_2	days/yr	365	365	365	365
Lifetime = **LT**	years	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)
Averaging time = **AT**	years	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)

2.2 Soil/Sediment Inhalation (Residential, Industrial, Recreational)

Equation 3 (non-radionuclides), equation 4 (radionuclides), and Table 2 present the exposure variables for the soil/sediment inhalation pathway for the residential, industrial, recreational, and agricultural scenarios. The particulate emission factor (PEF) is represented by the term that includes V, U_m/U_t, F(x), Q/C, and CF_3. The default PEF in SADA is 1.32E+9 (EPA 1996). The 1/VF term is only present in equation 2 if the contaminant is a volatile.

$$Nonrad\ Intake_{inh} = \frac{C_{sn}\ EF\ ED\left(\frac{1}{VF} + \frac{0.036\ (1-V)\ (U_m/U_t)^3\ F(x)}{(Q/C)\ CF_3}\right)}{CF_2\ AT} \qquad \text{Eq. 3}$$

$$Rad\ Intake_{inh} = C_{sr}\ CF_5\ EF\ ED\left(\frac{1}{VF} + \frac{0.036\ (1-V)\ (U_m/U_t)^3\ F(x)}{(Q/C)\ CF_3}\right) IR_{air} \qquad \text{Eq. 4}$$

Table 2. Soil/Sediment Inhalation Parameters

Parameter	Units	Residential	Industrial	Recreational	Agricultural
Non-radionuclide chemical concentration in soil = C_{sn}	mg/kg	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Radionuclide chemical concentration in soil = C_{sr}	pCi/g	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Exposure frequency = **EF**	day/year	350 (EPA 1989a)	250 (EPA 1991a)	40 (EPA 1992)	350 (EPA 1989a)
Exposure duration = **ED**	years	30 (EPA 1989a)	25 (EPA 1991a)	30 (EPA 1989a)	30 (EPA 1989a)
Conversion factor = CF_5	g/kg	1000	1000	1000	1000
Volatilization factor = **VF**	m^3/kg	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Fraction of vegetative cover = **V**	unitless	0.5 (EPA 1996)	0.5 (EPA 1996)	0.5 (EPA 1996)	0.5 (EPA 1996)

Mean annual windspeed = U_m	m/s	4.69 (EPA 1996)	4.69 (EPA 1996)	4.69 (EPA 1996)	4.69 (EPA 1996)
Equivalent threshold value of windpeed at 7 m = U_t	m/s	11.32 (EPA 1996)	11.32 (EPA 1996)	11.32 (EPA 1996)	11.32 (EPA 1996)
Function dependent on U_m/U_t= F(x)	unitless	0.194 (Cowherd 1985)	0.194 (Cowherd 1985)	0.194 (Cowherd 1985)	0.194 (Cowherd 1985)
Inverse of the mean concentration at the center of a 0.5 acre-square source = Q/C	(g m^3)/ (m^2 s kg)	90.8 (EPA 1996)	90.8 (EPA 1996)	90.8 (EPA 1996)	90.8 (EPA 1996)
Seconds in an hour = CF_3	s/h	3600	3600	3600	3600
Total inhalation rate = IR_{air}	m^3/day	20 (EPA 1989a)	20 (EPA 1989a)	6.7 (8 hours) (EPA 1992)	20 (EPA 1989a)
Conversion Factor = CF_2	days/yr	365	365	365	365
Body weight = BW	kg	70 (adult) (EPA 1991a)	70 (adult) (EPA 1991a)	70 (adult) (EPA 1991a)	70 (adult) (EPA 1991a)
Lifetime = LT	years	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)
Averaging time = AT	years	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)

2.3 Soil/Sediment Dermal Contact (Residential, Industrial, Recreational)

Equation 5 (non-radionuclides) and Table 3 present the exposure variables for the soil/sediment dermal contact pathway for the residential, industrial, and recreational scenarios.

$$Nonrad\ Intake_{der} = \frac{C_{sn}\ CF_4\ SA\ AF\ ABS\ EF\ ED}{CF_2\ BW\ AT} \qquad \text{Eq. 5}$$

Table 3. Soil/Sediment Dermal Contact Parameters

Parameter	Units	Residential	Industrial	Recreational	Agricultutal
Non-radionuclide chemical concentration in soil = C_{sn}	mg/kg	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Conversion factor = CF_4	(kg-cm^2)/ (mg-m^2)	0.01	0.01	0.01	0.01
Surface area = SA	m^2/day	0.53 Hand, forearms, head lower legs (EPA 1992)	0.316 Hands, forearms, head (EPA 1992)	0.53 Hand, forearms, head lower legs (EPA 1992)	0.53 Hand, forearms, head lower legs (EPA 1992)
Adherence factor = AF	mg/cm^2	1 (EPA 1992)	1 (EPA 1992)	1 (EPA 1992)	1 (EPA 1992)
Absorption factor = ABS	unitless	0.01 (organic) 0.001 (inorganic) (EPA 1995)	0.01 (organic) 0.001 (inorganic) (EPA 1995)	0.01 (organic) 0.001 (inorganic) (EPA 1995)	0.01 (organic) 0.001 (inorganic) (EPA 1995)
Exposure frequency = EF	day/yr	350 (EPA 1991)	250 (EPA 1991a)	40 (EPA 1992)	350 (EPA 1991)

Exposure duration = **ED**	years	30 (EPA 1989a)	25 (EPA 1991a)	30 (EPA 1989a)	30 (EPA 1989a)
Body weight = **BW**	kg	70 (adult) (EPA 1991a)	70 (adult) (EPA 1991a)	70 (adult) (EPA 1991a)	70 (adult) (EPA 1991a)
Conversion Factor = $\mathbf{CF_2}$	days/yr	365	365	365	365
Lifetime = **LT**	years	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)
Averaging time = **AT**	years	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)

2.4 Soil/Sediment Produce Ingestion (Agricultural)

Equation 6 (non-radionuclides), equation 7 (radionuclides), and Table 4 present the exposure variables for the soil/sediment produce ingestion pathway. The produce ingestion pathway is conducted for the agricultural scenario only.

$$Nonrad\ Intake_{pr\ ing} = \frac{C_{sn}\ (BV_{wet} \times MLF)\ FI_v\ IR_v\ EF\ ED}{CF_2\ BW\ AT} \qquad \text{Eq. 6}$$

$$Rad\ Intake_{pr\ ing} = C_{sr}\ (BV_{wet} \times MLF)\ CF_5\ FI_v\ IR_v\ EF\ ED \qquad \text{Eq. 7}$$

Table 4. Soil/Sediment Produce Ingestion Parameters

Parameter	Units	Agricultural
Non-radionuclide chemical concentration in soil = $\mathbf{C_{sn}}$	mg/kg	Chemical-specific
Radionuclide chemical concentration in soil = $\mathbf{C_{sr}}$	pCi/g	Chemical-specific
Soil to plant uptake factor (wet) = $\mathbf{BV_{wet}}$	kg/kg	Chemical-specific
Mass loading factor = **MLF**	unitless	0.26 (Pinder and McLeod 1989)
Conversion factor = $\mathbf{CF_5}$	g/kg	1000
Diet fraction = $\mathbf{FI_v}$	unitless	0.4 (EPA 1989b)
Ingestion rate = $\mathbf{IR_v}$	kg/d	0.2 (EPA 1989b)
Exposure frequency = **EF**	d/year	350 (EPA 1989a)
Exposure duration = **ED**	years	30 (EPA 1989a)
Conversion Factor = $\mathbf{CF_2}$	days/yr	365

Body weight (adult) = **BW**	kg	70 (EPA 1989a)
Lifetime = **LT**	years	70 (EPA 1989a)
Averaging time = **AT**	years	LT (carcinogen) ED (noncarcinogen)

2.5 Soil/Sediment Beef Ingestion (Agricultural)

Equation 8 (non-radionuclides), equation 9 (radionuclides), and Table 5 present the exposure variables for the soil/sediment beef ingestion pathway. The beef ingestion pathway is conducted for the agricultural scenario only.

$$Nonrad\ Intake_{beef\ ing} = \frac{F_f\ C_{sn}\ f_p\ (Q_p\ f_s\ (BV_{dry} \times MLF) + Q_s)\ IR_f\ FI\ EF\ ED}{CF_2\ BW\ AT} \qquad \text{Eq. 8}$$

$$Rad\ Intake_{beef\ ing} = F_f\ C_{sr}\ f_p\ (Q_p\ f_s\ (BV_{dry} \times MLF) + Q_s)\ CF_5\ IR_f\ FI\ EF\ ED \qquad \text{Eq. 9}$$

Table 5. Soil/Sediment Beef Ingestion Parameters

Parameter	Units	Agricultural
Non-radionuclide chemical concentration in soil = $\mathbf{C_{sn}}$	mg/kg	Chemical-specific
Radionuclide chemical concentration in soil = $\mathbf{C_{sr}}$	pCi/g	Chemical-specific
Beef transfer coefficient = $\mathbf{F_f}$	day/kg	Chemical-specific
Fraction of year animal is on site = $\mathbf{f_p}$	unitless	1 (Site-specific)
Soil to plant uptake factor (dry) = $\mathbf{BV_{dry}}$	kg/kg	Chemical-specific
Mass loading factor = **MLF**	unitless	0.26 (Pinder and McLeod 1989)
Quantity of pasture ingested = $\mathbf{Q_p}$	kg/day	7.2 (IAEA 1994)
Quantity of soil ingested = $\mathbf{Q_s}$	kg/day	1 (Darwin 1990)
Fraction of animal feed from site = $\mathbf{f_s}$	unitless	1 (Site-specific)
Beef ingestion rate[c] = $\mathbf{IR_f}$	kg/day	0.075 (EPA 1989b)
Conversion factor = $\mathbf{CF_5}$	g/kg	1000

Diet fraction = **FI**	unitless	1 (Site-specific)
Exposure frequency = **EF**	day/yr	350 (EPA 1989a)
Exposure duration = **ED**	years	30 (EPA 1989a
Conversion Factor = $\mathbf{CF_2}$	days/yr	365
Body weight = **BW**	kg	70 (EPA 1989a)
Lifetime = **LT**	years	70 (EPA 1989a)
Averaging time = **AT**	years	LT (carcinogen) ED (noncarcinogen)

2.6 Soil/Sediment Milk Ingestion (Agricultural)

Equation 10 (non-radionuclides), equation 11 (radionuclides), and Table 6 present the exposure variables for the soil/sediment milk ingestion pathway. The milk ingestion pathway is conducted for the agricultural pathway only.

$$Nonrad\ Intake_{milk\ ing} = \frac{F_m\ C_{sn}\ f_p\ (Q_p\ f_s\ (BV_{dry} \times MLF) + Q_s)\ IR_m\ FI\ EF\ ED}{CF_2\ BW\ AT} \qquad \text{Eq. 10}$$

$$Rad\ Intake_{milk\ ing} = F_m\ C_{sr}\ f_p\ (Q_p\ f_s\ (BV_{dry} \times MLF) + Q_s)\ CF_5\ IR_m\ FI\ EF\ ED \qquad \text{Eq. 11}$$

Table 6. Soil/Sediment Milk Ingestion Parameters

Parameter	Units	Agricultural
Non-radionuclide chemical concentration in soil = $\mathbf{C_{sn}}$	mg/kg	Chemical-specific
Radionuclide chemical concentration in soil = $\mathbf{C_{sr}}$	pCi/g	Chemical-specific
Milk transfer coefficient = $\mathbf{F_m}$	day/L	Chemical-specific
Fraction of year animal is on site = $\mathbf{f_p}$	unitless	1 (Site-specific)
Soil to plant uptake factor (dry) = $\mathbf{BV_{dry}}$	kg/kg	Chemical-specific
Mass loading factor = **MLF**	unitless	0.26 (Pinder and McLeod 1989)
Quantity of pasture ingested = $\mathbf{Q_p}$	kg/day	7.2 (IAEA 1994)

Quantity of soil ingested = Q_s	kg/day	1 (Darwin 1990)
Fraction of animal feed from site = f_s	unitless	1 (Site-specific)
Conversion factor = CF_5	g/kg	1000
Diet fraction = **FI**	unitless	1 (Site-specific)
Ingestion Rate = IR_w	L/d	0.509 (adult) 0.305 (child) (EPA 1989b)
Exposure frequency = **EF**	d/year	350 (EPA 1989a)
Exposure duration = **ED**	years	24 (adult) 6 (child) (EPA 1989a)
Body weight = **BW**	kg	70 (adult) 15 (child) (EPA 1991a)
Lifetime = **LT**	years	70 (EPA 1989a)
Averaging time = **AT**	yr × day/yr	70 × 365 (carcinogen) ED × 365 (noncarcinogen)

3 Surface Water/ Groundwater Exposure Pathways

Exposure pathways evaluated for surface water and groundwater include ingestion, indoor inhalation, dermal contact, and agricultural pathways.

3.1 Surface Water/Groundwater Ingestion (Residential, Industrial, Recreational)

Equation 12 (non-radionuclides), equation 13 (radionuclides), and Table 7 present the exposure variables for the surface water/groundwater ingestion pathway. This pathway is conducted for the residential, industrial, and inhalation pathways.

$$Nonrad\ Intake_{ing} = \frac{C_{wn}\ IR_w E\ F\ ED}{CF_2\ BW\ AT} \qquad \text{Eq. 12}$$

$$Rad\ Intake_{ing} = C_{wr}\ IR_w\ EF\ ED \qquad \text{Eq. 13}$$

Table 7. Surface Water/Groundwater Ingestion Parameters

Parameter	Units	Residential	Industrial	Recreational	Agricultural

Non-radionuclide chemical concentration in water = C_{wn}	mg/L	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Radionuclide chemical concentration in water = C_{wr}	pCi/L	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Ingestion Rate = IR_w	L/d	2 (EPA 1989a)	1 (EPA 1991a)	.05 (EPA 1995)	2 (EPA 1989)
Exposure frequency = **EF**	d/year	350 (EPA 1989a)	250 (EPA 1991a)	7 (EPA 1992)	350 (EPA 1989a)
Exposure duration = **ED**	years	30 (EPA 1989a)	25 (EPA 1991a)	30 (EPA 1989a)	30 (EPA 1989a)
Body weight = **BW**	kg	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)
Conversion Factor = CF_2	days/yr	365	365	365	365
Lifetime = **LT**	years	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)
Averaging time = **AT**	years	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)

3.2 Surface Water/Groundwater Indoor Inhalation (Residential)

Equation 14 (non-radionuclides), equation 15 (radionuclides), and Table 8 present the exposure variables for the surface water/groundwater inhalation pathway from showering and from indoor water use. This pathway is conducted for the residential and agricultural scenarios only. The industrial and recreational default intake rates are set to 0 m^3/day.

$$Nonrad\ Intake_{inh} = \frac{C_{wn}\ VF\ EF\ ED}{CF_2\ AT} \qquad \text{Eq. 14}$$

$$Rad\ Intake_{inh} = C_{wr}\ IR_{air}\ CF_9\ IEF\ EF\ ED \qquad \text{Eq. 15}$$

Table 8. Surface Water/Groundwater Inhalation while Showering Parameters

Parameter	Units	Residential	Industrial	Recreational	Agricultural
Non-radionuclide chemical concentration in water = C_{wn}	mg/L	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Radionuclide chemical concentration in water = C_{wr}	pCi/L	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Volatilization Factor = **VF**	L/m^3	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific

Inhalation rate = IR_{air}	m^3/hour	20 (EPA 1989a)	0	0	20 (EPA 1989a)
Exposure frequency = **EF**	day/year	350 (EPA 1991)	250 (EPA 1991a)	40 (EPA 1992)	350 (EPA 1991)
Exposure duration = **ED**	years	30 (EPA 1989a)	25 (EPA 1991a)	30 (EPA 1989a)	30 (EPA 1989a)
Inhalation exposure factor = **IEF**	(L hr)/ (m^3 day)	0.2802 (Tritium) 7.603 (Radon) 0 (other radionuclides)	0.2802 (Tritium) 7.603 (Radon) 0 (other radionuclides)	0.2802 (Tritium) 7.603 (Radon) 0 (other radionuclides)	0.2802 (Tritium) 7.603 (Radon) 0 (other radionuclides)
Body weight = **BW**	kg	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)
Conversion Factor = CF_6	days/hr	1/24	1/24	1/24	1/24
Conversion Factor = CF_2	days/yr	365	365	365	365
Lifetime = **LT**	years	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)
Averaging time = **AT**	years	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)

3.3 Surface Water/Groundwater Dermal Contact (Residential, Recreational)

Equation 16 (non-radionuclides), equation 17 (radionuclides), and Table 10 present the exposure variables for the surface water/groundwater dermal contact pathway for groundwater or surface water. This pathway is conducted for the residential, recreational, and agricultural scenarios only. The industrial scenario has the skin surface area exposed set to 0 m^3 and the exposure time is set to 0 hours.

$$Nonrad\ Intake_{der} = \frac{C_{wn}\ SA\ P_c\ CF_6\ ED\ EF\ ET}{CF_2\ BW\ AT} \qquad \text{Eq. 16}$$

$$Rad\ Intake_{der} = C_{wr}\ SA\ P_c\ CF_6\ ED\ EF\ ET \qquad \text{Eq. 17}$$

Table 10. Surface Water/Groundwater Dermal Contact Parameters

Parameter	Units	Residential	Industrial	Recreational	Agricultural
Non-radionuclide chemical concentration in water = C_{wn}	mg/L	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Radionuclide chemical concentration in water = C_{wr}	pCi/L	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Skin surface area exposed = **SA**	m^2	1.94 (EPA 1989a)	0	1.94 (EPA 1989a)	1.94 (EPA 1989a)

Skin permeability constant = P_c	cm/hr	Chemical-specific	Chemical-specific	Chemical-specific	Chemical-specific
Conversion Factor = CF_4	(L-m)/ (cm-m^3)	10	10	10	10
Exposure duration = **ED**	years	30 (EPA 1989a)	25 (EPA 1991a)	30 (EPA 1989a)	30 (EPA 1989a)
Exposure frequency = **EF**	events/yr	350 (EPA 1989a)	250 (EPA 1991a)	7 (EPA 1992)	350 (EPA 1989a)
Exposure time = **ET**	hrs/event	0.2 (EPA 1992)	0	2.6 (EPA 1989a)	0.2 (EPA 1992)
Body weight = **BW**	kg	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)
Conversion Factor = CF_2	days/yr	365	365	365	365
Lifetime = **LT**	years	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)	70 (EPA 1989a)
Averaging time = **AT**	years	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)	LT (carcinogen) ED (noncarcinogen)

3.4 Surface Water/Groundwater Produce Ingestion (Agricultural)

Equation 18 (non-radionuclides), equation 19 (radionuclides), and Table 11 present the exposure variables for the surface water/groundwater produce ingestion pathway. The produce ingestion pathway is conducted for the agricultural pathway only.

$$Nonrad\ Intake_{pro\ ing} = \frac{C_{wn}\ r_{irr}\ f_{irr}\left[\frac{(BV_{wet} \times MLF)\ (1-\exp(-?_l\ t_b))}{P\ ?_l} + \frac{I_f\ T\ (1-\exp(-?_E\ t_v))}{Y_v\ ?_E}\right] FI_v\ IR_v\ EF\ ED}{CF_2\ BW\ AT} \quad \text{Eq. 18}$$

$$Rad\ Intake_{pro\ ing} = C_{wr}\ r_{irr}\ f_{irr}\left[\frac{(BV_{wet} \times MLF)\ (1-\exp(-?_l\ t_b))}{P\ ?_l} + \frac{I_f\ T\ (1-\exp(-?_E t_v))}{Y_v\ ?_E}\right] FI_v\ IR_v\ EF\ ED \quad \text{Eq. 19}$$

Table 11. Surface Water/Groundwater Produce Ingestion Parameters

Parameter	Units	Agricultural
Non-radionuclide chemical concentration in water = C_{wn}	mg/L	Chemical-specific
Radionuclide chemical concentration in water = C_{wr}	pCi/L	Chemical-specific
Irrigation rate = r_{irr}	L/m^2 day	2.08 (Kennedy and Strenge 1992)
Irrigation period = f_{irr}	unitless	0.25 (3 months)

Soil to plant uptake factor (wet) = BV_{wet}	kg/kg	Chemical-specific
Mass loading factor = **MLF**	unitless	0.26 (Pinder and McLeod 1989)
Effective removal rate = $?_r$	1/day	$?_l+?_M$
Soil leaching rate = $?_l$	1/day	2.7E-5 (NCRP 1989)
Radionuclide half-life = $?_M$	1/day	Chemical-specific
Long-term deposition and buildup = t_b	day	10950 (NCRP 1985)
Areal density for root zone = **P**	kg/m^2	240 (Hoffman et al. 1982)
Interception fraction = I_f	unitless	0.42 (Miller 1980)
Translocation factor = **T**	unitless	1 (McKone 1994)
Decay for removal on produce = $?_E$	1/day	$?_l+0.693/t_w$ (NCRP 1989)
Weathering half-life = t_w	1/day	14 (NCRP 1985)
Above ground exposure time = t_v	days	60 (NCRP 1985)
Plant yield (wet) = Y_v	kg/m^2	2 (NCRP 1985)
Diet fraction = FI_v	unitless	0.4 (EPA 1989b)
Ingestion rate = IR_v	kg/d	0.2 (EPA 1989b)
Exposure frequency = **EF**	d/year	350 (EPA 1989a)
Exposure duration = **ED**	years	30 (EPA 1989a)
Body weight (adult) = **BW**	kg	70 (EPA 1989a)
Conversion Factor = CF_2	days/yr	365
Lifetime = **LT**	years	70 (EPA 1989a)
Averaging time = **AT**	years	LT (carcinogen) ED (noncarcinogen)

3.5 Surface Water/Groundwater Beef Ingestion (Agricultural)

Equation 20 (non-radionuclides), equation 21 (radionuclides), and Table 12 present the exposure variables for the surface water/groundwater beef ingestion pathway. The beef ingestion pathway is conducted for the agricultural pathway only.

$$Nonrad\ Intake_{beef\ ing} = \frac{C_{wn}\ Q_w B f\ IR\ FI\ EF\ ED}{CF_2\ BW\ AT} \qquad \text{Eq. 20}$$

$$Rad\ Intake_{beef\ ing} = C_{wr}\ Q_w\ Bf\ IR\ FI\ EF\ ED \qquad \text{Eq. 21}$$

Table 12. Surface Water/ Groundwater Beef Ingestion Parameters

Parameter	Units	Agricultural
Non-radionuclide chemical concentration in water = C_{wn}	mg/L	Chemical-specific
Radionuclide chemical concentration in water = C_{wr}	pCi/L	Chemical-specific
Quantity of water ingested (cattle) = Q_w	L/day	50 (IAEA 1994)
Beef transfer coefficient = **Bf**	day/kg	Chemical-specific
Ingestion rate[c] = **IR**	kg/day	0.075 (EPA 1989b)
Conversion factor = **CF**	g/kg	1000
Diet fraction = **FI**	unitless	1
Exposure frequency = **EF**	day/yr	350 (EPA 1989a)
Exposure duration = **ED**	years	30 (EPA 1989a)
Body weight = **BW**	kg	70 (EPA 1989a)
Conversion Factor = CF_2	days/yr	365
Lifetime = **LT**	years	70 (EPA 1989a)
Averaging time = **AT**	years	LT (carcinogen) ED (noncarcinogen)

3.6 Surface Water/Groundwater Milk Ingestion (Agricultural)

Equation 22 (non-radionuclides), equation 23 (radionuclides), and Table 13 present the exposure variables for the surface water/groundwater milk ingestion pathway. The milk ingestion pathway is conducted for the agricultural pathway only.

$$Nonrad\ Intake_{milk\ ing} = \frac{C_{wn}\ Bm\ Q_w IR_m\ FI\ EF\ ED}{CF_2\ BW\ AT} \qquad \text{Eq. 22}$$

$$Rad\ Intake_{milk\ ing} \square\ C_{wr}\ Bm\ Q_w\ IR_m\ FI\ EF\ ED \qquad \text{Eq. 23}$$

Table 13. Surface Water/Groundwater Milk Ingestion Parameters

Parameter	Units	Agricultural
Non-radionuclide chemical concentration in water = C_{wn}	mg/L	Chemical-specific
Radionuclide chemical concentration in water = C_{wr}	pCi/L	Chemical-specific
Quantity of water ingested (dairy) = Q_w	L/day	75 (IAEA 1994)
Milk transfer coefficient = **Bm**	day/L	Chemical-specific
Ingestion Rate = IR_m	L/d	0.305 (adult) (EPA 1989b) 0.509 (child) (Pao et al. 1982)
Exposure frequency = **EF**	d/year	350 (EPA 1989a)
Exposure duration = **ED**	years	24 (adult) 6 (child) (EPA 1989a)
Body weight = **BW**	kg	70 (adult) 15 (child) (EPA 1991a)
Conversion Factor = CF_2	days/yr	365
Lifetime = **LT**	years	70 (EPA 1989a)
Averaging time = **AT**	years	LT (carcinogen) ED (noncarcinogen)

3.7 Surface Water Fish Ingestion (Recreational)

Equation 24 (non-radionuclides), equation 25 (radionuclides), and Table 14 present the exposure variables for the surface water fish ingestion pathway. The fish ingestion pathway is conducted for the recreational pathway only.

$$Nonrad\ Intake_{milk\ ing} \square\ \frac{C_{wn}\ B_{fish}\ IR_{fish}\ FI\ EF\ ED}{CF_2\ BW\ AT} \qquad \text{Eq. 24}$$

$$Rad\ Intake_{milk\ ing} \square\ C_{wr}\ B_{fish}\ IR_{fish}\ FI\ EF\ ED \qquad \text{Eq. 25}$$

Table 14. Surface Water Fish Ingestion Parameters

Parameter	Units	Agricultural
Non-radionuclide chemical concentration in water = C_{wn}	mg/L	Chemical-specific
Radionuclide chemical concentration in water = C_{wr}	pCi/L	Chemical-specific
Fish transfer coefficient = B_{fish}	day/L	Chemical-specific
Ingestion Rate = IR_{ai}	kg/d	0.054 (adult) (EPA 1991a)
Exposure frequency = **EF**	d/year	45 (EPA 1995)
Exposure duration = **ED**	years	30 (EPA 1989a)
Body weight = **BW**	kg	70 (adult) (EPA 1991a)
Conversion Factor = CF_2	days/yr	365
Lifetime = **LT**	years	70 (EPA 1989a)
Averaging time = **AT**	years	LT (carcinogen) ED (noncarcinogen)

4. Toxicity Data

SADA accesses a database of chemical-specific toxicity values that contains the human health toxicological information needed to perform the risk assessments. This database contains toxicity information taken from the United States Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS), the Health Effects Assessment Summary Tables (HEAST), and other sources. The toxicity database contains a variety of information that is used to either calculate risks or hazards (e.g., cancer slope factors and reference doses, respectively) or to derive dose estimates (e.g., volatilization factor, particulate emission factor). Reference Doses (RfDs), Reference Concentrations (RfCs), slope factors (SFs), and inhalation unit risks (IUR) are values which are used to determine either the potential of a toxic effect (RfD and RfC) or the development of excess cancers (slope factors and unit risks) in a receptor.

4.1 Noncarcinogenic Hazard

RfDs (for ingestion and dermal contact) and RfCs (for inhalation) are used in SADA to determine the hazard quotient based on the intake calculations previously presented. Equation 26 shows how the intake is divided by the RfC or RfD to yield the hazard quotient for a given contaminant and pathway.

$$Hazard = \frac{Intake}{RfD \text{ or } RfC} \qquad \text{Eq. 26}$$

4.2 Carcinogenic Risk

Slope factors (for ingestion, radionuclide inhalation, dermal contact, and external exposure) and inhalation unit risks (for nonradionuclide inhalation) are used in SADA based on the intake calculations

previously presented. Equation 27 shows how the inake is multiplied by the slope factor or unit risk to determine the carcinogenic risk for a given contaminant and pathway.

$$Risk \square Intake\ (SF \square IUR) \qquad \text{Eq. 27}$$

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