Closure of the Former Drum Storage Area Hanging Rock Plant Ironton, Ohio

Prepared for:
The Dow Chemical Company
Hanging Rock, Ohio

Prepared by:
Radian International LLC
Pittsburgh, Pennsylvania

Radian Project No. 007015.70

February 1997

RADIAN INTERNATIONAL LLC

OhioEPA
State of Ohio Environmental Protection Agency

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April 7, 1997

Completion of Closure
Dow Chemical, Hanging Rock Plant
U.S. EPA ID No.: OHD 039 128 913

Dow Chemical Company, Hanging Rock Plant
Attn: Mr. Dennis Stanley
925 County Road 1A
Ironton, Ohio 45638

Dear Mr. Stanley:

According to Ohio EPA records, on September 30, 1996, the Director of the Ohio EPA approved a closure plan for Dow Chemical, Hanging Rock Plant, 925 County Road 1A, Ironton, Ohio. The plan concerned the Old Drum Storage Area unit at the facility. The Ohio EPA has also received certification documents stating that the unit had been closed according to the specifications in the approved closure plan. Ohio EPA District Office personnel completed a closure inspection and a review of documents pertaining to the drum storage area on March 10, 1997.

Based on this inspection and review, the Ohio EPA has determined that the old hazardous waste drum storage area has been closed in accordance with the approved closure plan and Rules 3745-66-12 through 3745-66-15 of the Ohio Administrative Code (OAC). Moreover, Dow Chemical, Hanging Rock Plant, is no longer a hazardous waste treatment, storage & disposal facility (TSD); however, Dow Chemical, Hanging Rock Plant, remains a large quantity generator (LQG) of hazardous waste.

As specified in OAC Rule 3745-66-40, Dow Chemical, Hanging Rock Plant, will not be required to maintain financial assurance for closure costs and liability coverage for accidental occurrences at this location, in accordance with OAC Rules 3745-66-43(H) and 3745-66-47(E).

Please note that this letter does not relieve the facility of any corrective action responsibilities that may be required.

If you have any questions concerning the closure process or the current status of the facility, please contact the Ohio EPA, Southeast District Office, Attn: Mike Moschell, 2195 Front Sreet, Logan, Ohio 43138, tel.: 614-385-8501.

Sincerely yours,

Thomas E. Crepeau

Thomas E. Crepeau, Manager
Data Management Section
Division of Hazardous Waste Management

cc: Mike Moschell, SEDO

Maria Velalis, DMS, DHWM

George V. Voinovich, Governor
Nancy P. Hollister, Lt. Governor
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13 February 1997

Mr. Dennis Stanley
Environmental Compliance Leader
The Dow Chemical Company
Hanging Rock Plant
925 County Road 1A
Ironton, OH 45038

Subject: Closure Report for the Former Drum Storage Area

Dear Mr. Stanley:

Enclosed are 4 copies of a report entitled: Closure of the Former Drum Storage Area, Hanging Rock Plant, Ironton, Ohio. Please sign on the Closure Certification (page 3-13) before releasing this document to Ohio EPA.

Please feel free to call me if you have any questions.

Very truly yours,

Amiram Roffman

Amiram Roffman, Ph.D
Project Manager

AR:tr

Enclosures

PGH-97-AR-108

RADIAN INTERNATIONAL LLC

DCN: 97-007015-02

Closure of the
Former Drum Storage Area
Hanging Rock Plant
Ironton, Ohio

Prepared for:
The Dow Chemical Company
Hanging Rock, Ohio

Prepared by:
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February 1997

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1.0 Introduction and Summary

1.1 Introduction

A Closure of the Former Drum Storage Area at The Dow Chemical Company (Dow) Hanging Rock Plant, located on Gilruth Lane, Ironton, Ohio 45038, was completed on December 23, 1996. The Closure was implemented in accordance with the July 1996 Amended Closure Plan[1] which was approved by the Ohio Environmental Protection Agency (Ohio EPA) on September 30, 1996 (Appendix A). The Amended Closure Plan was approved for both an industrial and a residential soil cleanup standard, pursuant to the Ohio EPA Closure Plan Review Guidance for RCRA Facilities[2], and based on soil saturation values from the U.S. EPA Soil Screening Guidance: Technical Background Document[3].

This closure report details the closure activities including:

- Soil excavation;
- Sewer line removal;
- Post-excavation sampling and analysis to demonstrate compliance with the approved cleanup standards;
- Transportation and disposal including name of the disposal facility, quantities of soil and sewer line debris, and certificates of disposal;
- Closure certification by an Ohio Registered Professional Engineer (P.E.); and
- A survey of the closure area.

This report also demonstrates compliance with the residential cleanup standards for soil in the approved Amended Closure Plan. The site background is given in Section 2.0 and the closure activities are described in Section 3.0.

1.2 Summary

The closure of the Former Drum Storage Area met the following performance requirements:

- A closure action which is consistent with the Amended Closure Plan as approved by Ohio EPA and meets the residential cleanup standards set forth in the approved Amended Closure Plan;
- A closure action which is consistent with the regulatory requirements of Ohio EPA;
- Excavation and disposal of approximately 100 cubic yards of soil and sewer line debris, or approximately 154 tons;
- Characterization of the waste prior to disposal in an approved landfill;
- Transportation and disposal of soils and debris in accordance with state and federal applicable requirements;
- Post-excavation sampling and analysis which is consistent with the approved Amended Closure Plan. Soil sample analysis was performed by an Ohio EPA certified laboratory to ensure the integrity of the analytical results; and
- Closure certification by an Ohio Registered Professional Engineer and a survey of the area closed.

The excavated soil was transported and disposed off-site at the Michigan Disposal, Inc. landfill located on 49350 North I-94 Service Drive, Belleville, Michigan, as hazardous waste, although approximately one-half of the soil quantity which was near or below the sewer line, including the sewer line, was judged by Ohio EPA as soil that "does not contain a hazardous waste and may be disposed of at a non-hazardous waste disposal facility". (See Appendix B).

Post-excavation soil samples were collected from 18 locations in the excavation areas, 15 along the sewer line excavation trench and 3 in other areas where discretionary excavation was performed pursuant to good engineering practice. The soil samples were analyzed for constituents detected in the Former Drum Area in previous investigations. These included acrylonitrile (AN), ethylbenzene (EB), methylene chloride (MC), and styrene (ST). Laboratory analyses were performed using the U.S. EPA SW-846 Method 8240 (Gas Chromatography [GC])/[Mass

Spectrometry [MS]). Results of the analysis indicated that except for three locations, constituent concentrations were below the residential soil cleanup levels in the approved Amended Closure Plan. Additional excavation was performed at these three locations and soil samples collected after this additional soil excavation revealed that the residential soil cleanup levels were met for the entire Former Drum Storage Area.

The closure of the area was completed with backfill of the excavated area with clean soil and the survey of the area in question.

2.0 Site Background

This section provides an overview of the plant background including: location description, area to be closed, and past investigations. Details are included in the Amended Closure Plan[1].

2.1 Plant Location

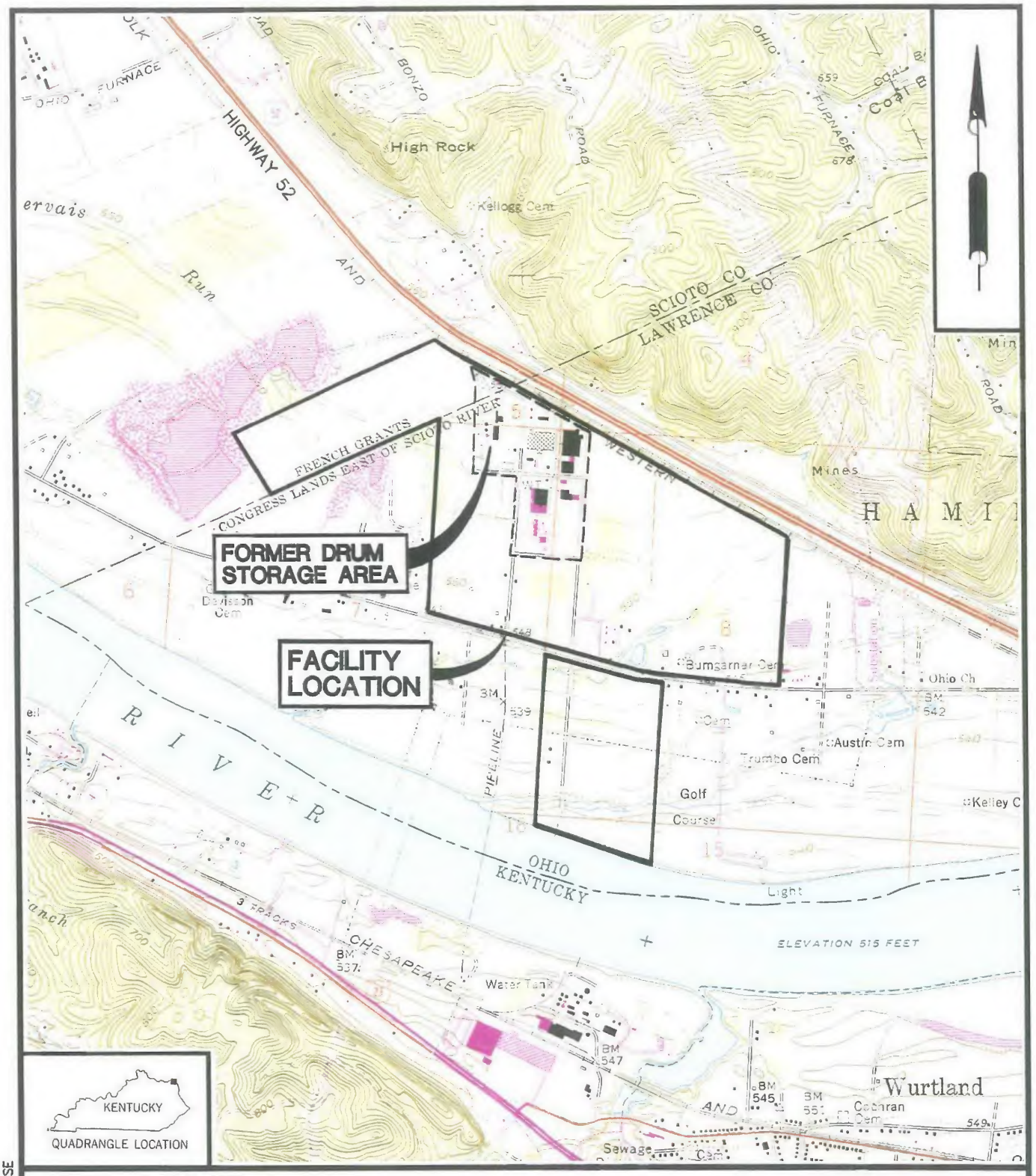
The Dow Hanging Rock Plant is located in Southeastern Ohio, approximately four miles northwest of Ironton (Figure 1). Shown in Figure 1 are the Dow property line and plant area, which occupies only a small portion of property. The plant is located on a 750-acre property in Hamilton Township in southeast Lawrence County. The property owned by Dow is bounded to the north by wooded hills beyond State Highway 52, to the south by the Ohio River, to the east by farmland, and to the west by the Lawrence-Scioto County line. The Big Thief Creek flows east to west through the southern portion of Dow's property, joining the Ohio River approximately 1,000 feet outside the property line.

The plant address is:

The Dow Chemical Company
Hanging Rock Plant
Gilruth Lane
Ironton, Ohio 45038

2.2 Plant Description

The Dow Hanging Rock Plant was constructed in 1957. The plant currently manufactures and ships polymeric beads and foams. Three plants are presently operating at the Hanging Rock Site: the Styron plant, the Styrofoam plant, and the Ethafoam plant. The Styron plant began operations in 1968. The plant produces bulk quantities of high impact polystyrene using the trade name of Styron™, acrylonitrile butadiene styrene (ABS) co-polymer using the trade name Magnum™, and general purpose polystyrene (GP). The products consist of ⅛-inch to ¼-inch beads, and are typically shipped by railcar.



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SCALE IN FEET

REFERENCE:
BASE MAP IS A PORTION OF THE U.S.G.S. 7.5 MINUTE TOPOGRAPHIC SERIES GREENUP, KY–OHIO QUADRANGLE. DATED: 1972, PHOTOREVISED: 1985. SCALE: 1" = 2000', CONTOUR INTERVAL IS 20 FEET.

FILE: \7015\2000BASE

RADIAN INTERNATIONAL LLC

PLANT LOCATION, PROPERTY LINE AND PLANT AREA

HANGING ROCK PLANT — IRONTON, OHIO

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015	
SCALE: AS SHOWN	FIGURE NUMBER 1		REV 0

The Styrofoam plant began operations in 1957. This plant produces polystyrene foam using the trade name Styrofoam™ which has excellent insulating properties and is primarily used by the construction industry. The products range in thickness from ⅛-inch to 3-inches, and have various lengths and widths.

The Ethafoam plant produces polyethylene foam using the trade name Ethafoam™. Ethafoam is a dynamic cushioning material with some elastic properties. It requires further processing from fabricators, one typical use being to protect computers or other shock-sensitive products during shipping. A final Ethafoam product is Seal Sil. It consists of 50-foot, 6-inch-wide rolls of foam, which are used to seal house foundations.

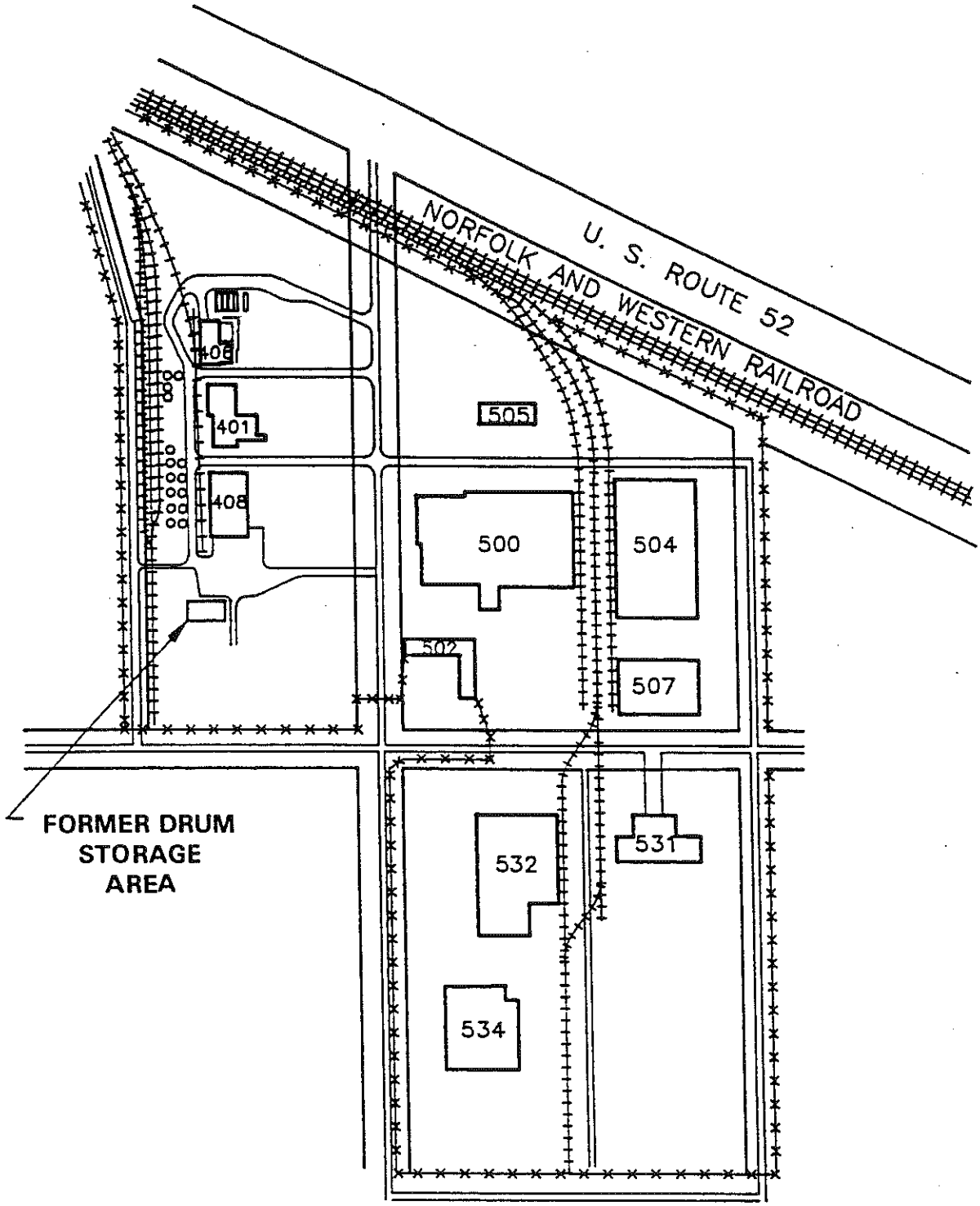
The raw materials used in the production of the plant products include liquid styrene, ethylbenzene, acrylonitrile, polyethylene, various catalysts and blowing agents, and butadiene rubber. The three main operations have the necessary support facilities including process boilers, cooling towers, materials Storage and handling, collection sumps, a wastewater treatment system, and miscellaneous auxiliary operations.

2.3 The Area to be Closed

The Former Drum Storage Area which consists of approximately 50 by 100-foot area and is located to the southwest of the Styron plant (Figure 2) was the subject of this closure. This area was used between 1978 and 1980 to store 55-gallon drums of ignitable wastes (D001) generated in the polystyrene production area. The drums were stored on wooden pallets. Storage of drums ceased in 1980 and before closure activities occured the area was partially covered with grass.

Wastes stored in these drums consisted mostly of liquid ignitable wastes generated in the polystyrene plant. These wastes may have contained styrene, ethylbenzene, and partially polymerized polystyrene. Between 1978 and 1980, the contents of the drums were pumped into trucks and railcars for transporting to offsite incineration. The empty drums were crushed in the area with a backhoe and transported to the Hanging Rock Landfill for deposition.

Constituents identified in the Part A permit application were those typically found in drums stored in the Former Drum Storage Area. They include AC, EB, Mc, and ST. Additional details of this area and its history are provided in the Closure Plan.



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SCALE IN FEET

NOTE: ONLY MAIN FEATURES ARE SHOWN ON THIS PLAN.

FILE: \7015\2-SHELL

RADIAN INTERNATIONAL LLC

FORMER DRUM STORAGE AREA LOCATION

HANGING ROCK PLANT — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY — JOB NUMBER: 7015-700

SCALE: AS SHOWN — FIGURE NUMBER 2 — REV 0

2.4 Regulatory Requirements

A Closure Plan was developed in May 1991 and was revised to include additional information on the level and extent of constituents in soil in the Former Drum Storage Area. Details of the activities leading to the approved Closure Plan are provided in Section 2.4 of the Amended Closure Plan[1]. A summary of the closure activities for the Former Drum Storage Area is provided in Table 1. Based on the findings from the various investigations, the Ohio EPA approved a risk-based cleanup for this area which considers exposure to constituents in soil via inhalation, ingestion, and dermal contact and excluded the groundwater pathways.

The Amended Closure Plan was prepared and submitted to Ohio EPA in July 1996. The plan was based on the findings from the various phases of investigation and focused on excavating and disposing of soil with constituent concentrations exceeding the risk-based cleanup standards for soil.

Table 2 includes the risk-based industrial and residential soil cleanup levels for soil for the Former Drum Storage Area. These cleanup levels were derived based on the Ohio EPA Closure Plan Review Guidance for RCRA Facilities[2] and soil saturation values from the U.S. EPA Soil Screening Guidance: Technical Background Document (EPA/540/R-95/128, May, 1996)[3]. The lower or most conservative of the two values was included in Table 2. Multi-constituent multi-pathway, cumulative and additive exposure scenarios have been used to establish the standards for both the industrial and residential scenarios. Appendix E of the Closure Plan includes details of the methodology and assumptions used in developing these soil cleanup criteria.

This report addresses the closure of the Former Drum Storage Area including excavation and removal of a section of the process sewer line underlaying this area. A separate document will address the Voluntary Closure of other sections of the process sewer line including the section to the north of the Former Drum Storage Area extending to manhole No. 3, and a section to the south extending approximately 60 feet to the asphalt road[4].

2.5 Proposed Excavation

Estimates of soil excavation were made based on the results of the various investigations and other data regarding the proposed construction of a new sump to the south of the Former

Table 1. A Summary of Closure Activities for the Former Drum Storage Area Dow Hanging Rock Plant

Date	Description of Activity
April 26, 1991:	Ohio EPA issued an order to perform a final closure of the Former Drum Storage Area.
May 31, 1991:	A closure plan for the Former Drum Storage Area was prepared by OHM Remediation Service Corp. (OHM) and submitted to Ohio EPA.
November 4, 1991:	Ohio EPA approved the closure plan.
May, 1992:	Phase I field closure activities were performed by OHM (collection of 22 soil samples and analyses for VOCs).
June, 1992:	Phase II field closure activities were performed by OHM (excavation of two 16-foot x 16-foot areas to a depth of 1 to 1.5 feet and collection of three confirmatory soil samples).
February, 1993:	Phase III field closure activities were performed by OHM (collection of 72 soil samples for soil-vapor analyses to determine the extent of constituents in the Former Drum Storage Area). The proposed activities were included in a February 19, 1993 Amended RCRA Closure Plan that was submitted to Ohio EPA.
May, 1993:	OHM Phase III soil-vapor data were interpreted by Dow Environmental, Inc. (DEI, formerly AWD Technologies) to identify a surface source (i.e., the Former Drum Storage Area) and a subsurface source (i.e., the process sewer line underlaying the Former Drum Storage Area).
July 21, 1993:	Process sewer line investigation was performed and confirmed the DEI interpretation of the soil-vapor data.
August 10, 1993:	OHM prepared a preliminary report for the RCRA closure activities, which summarized Phase I, II, and III soil sampling and analysis.
August 25, 1993:	Ohio EPA recommended that Dow submit a closure plan modification.

Table 1. A Summary of Closure Activities for the Former Drum Storage Area Dow Hanging Rock Plant (Continued)

Date	Description of Activity
September, 1993:	A closure plan modification, prepared by DEI, was submitted to Ohio EPA.
August, 1994:	Draft revisions to the Closure Plan were prepared by DEI and submitted to Ohio EPA based on comments received from them.
September, 1994:	Ohio EPA requested that the extent at AN, EB, MC, and ST in soil be adequately defined, based on a review of the Draft Revisions to the Closure Plan.
October, 1994:	Phase IV field closure activities were performed by DEI (78 soil samples were collected and 67 were analyzed for AN, EB, MC, and ST). A report was submitted in February 1995.
October, 1995:	Ohio EPA requested that additional soil sampling be done to assess the horizontal and vertical extent of constituents in soil adjacent to the process sewer line to the north of the Former Drum Storage Area, based on a review of the February 1995 Phase IV Sampling Report.
January, 1996:	Supplemental Phase IV Sampling Program was implemented by DEI. A summary report was submitted to Ohio EPA in March 1996.
April, 1996:	Dow proposed a closure for the Former Drum Storage Area which included excavation and disposal of soil from the area of the process sewer line, an additional soil excavation to provide a space for a collection sump, and completion of the closure activities based on risk-based cleanup levels excluding the groundwater exposure pathways. This was based on results of the January 1996 study which showed no presence of groundwater to the entire depth of sub-surface soil investigation. In addition, Dow proposed a voluntary closure of a section of the process sewer line extending to the north of the Former Drum Storage Area to manhole No. 3.

Table 1. A Summary of Closure Activities for the Former Drum Storage Area Dow Hanging Rock Plant (Continued)

Date	Description of Activity
May, 1996:	Ohio EPA concurred with the April 1996 Dow proposed approach and agreed that the groundwater pathway need not be considered in the development of risk-based soil cleanup levels. The Ohio EPA letter led to the preparation of the Closure Plan just implemented.
July, 1996:	Dow submits an Amended Closure Plan.
September 30, 1996:	Ohio EPA approves the Amended Closure Plan.

Table 2. Risk-Based Soil Cleanup Levels for the Former Drum Storage Area Dow, Hanging Rock Plant

Constituent	Industrial Land Use Cleanup Level (mg/kg)*	Residential Land Use Cleanup Level (mg/kg)**
Acrylonitrile	2.5*	1.0*
Ethylbenzene	400**	400**
Methylene Chloride	50*	20*
Styrene	1,200*	450*

* Derived based on the Ohio EPA Closure Plan Review for RCRA Facilities.[2]

** Based on soil saturation values from the U.S. EPA Soil Screening Guidance: Technical Background Document.[3]

Drum Storage Area. Section 3.1.3 of the Amended Closure Plan[1] outlined the excavation areas including the estimated volume of soil to be removed. These estimates were based on the assumption that a portion of the proposed collection sump would be located on the Former Drum Storage Area. A detailed engineering evaluation of the proposed sump area identified an underground fire protectin line (FPL) in the section of the Former Drum Storage Area which was proposed for the collection sump.

As a result, Dow decided to move the sump south of the Former Drum Storage Area and eliminate any construction activities related to the sump in this area. Therefore, the only construction activities to take place in the Former Drum Storage Area were to be associated with replacement of a section of the process sewer line.

The proposed excavation for the Former Drum Storage Area included:

- Area along the process sewer line: 90 cubic yards (cy), from a 50 ft x 4 ft area to a depth of up to 12 feet; and
- Areas of discretionary excavation: up to 50 cy based on visual observations of stained soil, exceedance of the soil cleanup criteria and excavation pursuant to good engineering practices.

The estimated total volume of soil to be excavated was 140 cy. Assuming a fluff factor of 1.3, the quantity of soil to be disposed of was approximately 180 cy.

3.0 Closure Activities

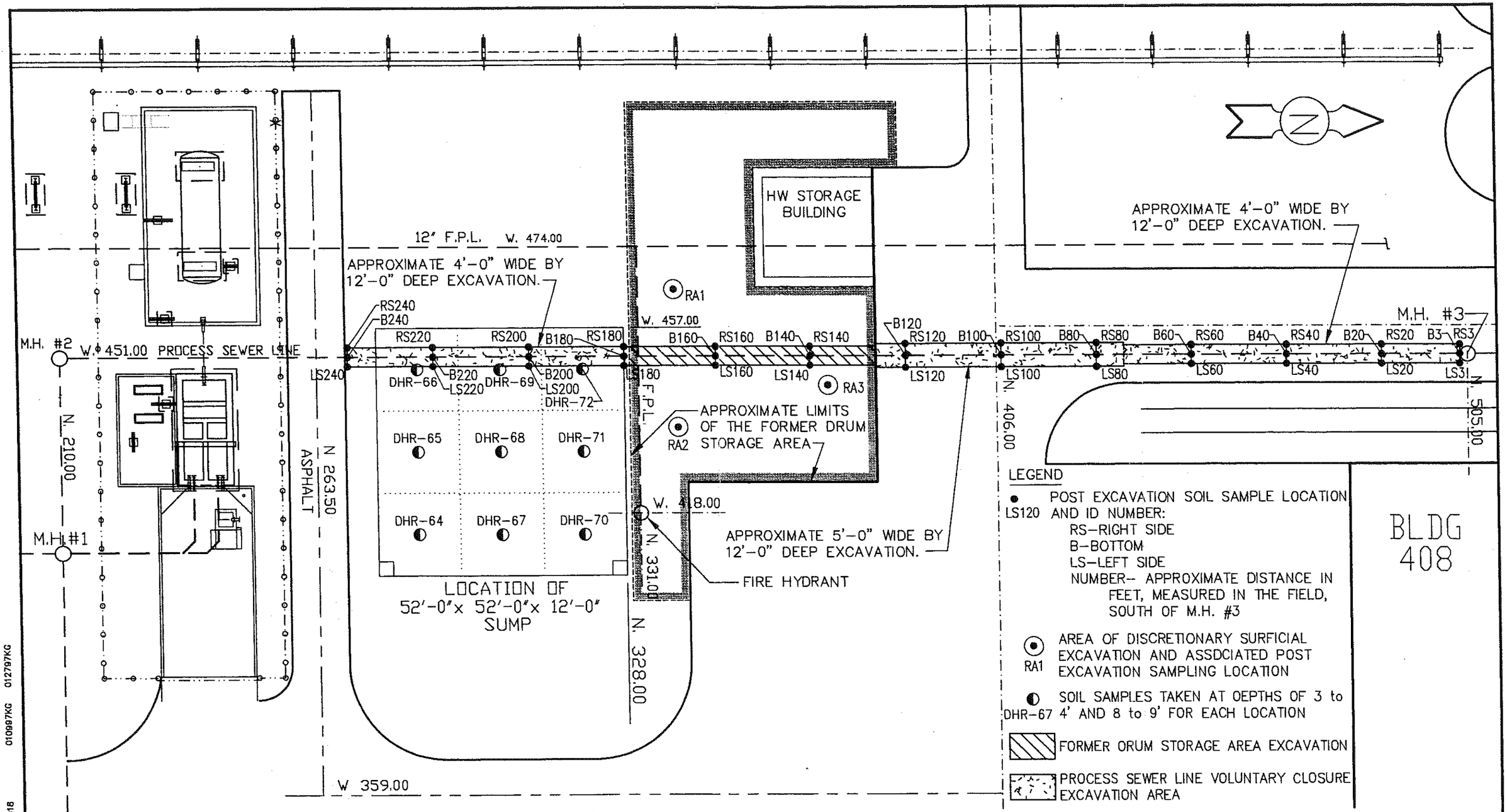
Closure activities included excavation, sewer line removal, post-excavation sampling and analysis, waste characterization, transportation and off-site disposal, backfilling and restoration of the excavated areas. This section addresses these activities.

3.1 Excavation

Soil excavation started from manhole No. 3 and proceeded southward along the process sewer line to the asphalt road located to the south of the Former Drum Storage Area. Figure 3 shows the excavation areas. Also shown is the revised location for the collection sump.

A total of 235 linear feet were excavated along the process sewer line. The average width of the excavation was 4 feet with the exception of a section of 52 feet in length which was excavated to a width of 5 feet. The average depth was 12 feet with the exception of several 10-foot sections which were excavated to a depth of 14 and 15 feet. Approximately 692 tons of soil were excavated and disposed of in off-site landfills.

Of the total 692 tons, approximately 150 tons were excavated from the Former Drum Storage Area and were disposed of as hazardous waste. The remaining 542 tons of soil were excavated and disposed of under a voluntary closure of sections of the process sewer line will be discussed in a separate document for the voluntary closure of the process sewer line. It should be noted that approximately 216 tons of the soil excavated voluntarily, were disposed of as hazardous waste based on a management measure taken by Dow for areas adjacent to the former Drum Storage Area. Based on discussions with Ohio EPA and their response (see Appendix B), the entire 542 tons of soil excavated from the section of the process sewer line could have been disposed of as non-hazardous waste. This included approximately 4 tons of the sewer line debris from the Former Drum Storage Area.



REFERENCE:
BASE MAP IS A PORTION OF CAD FILE NAME B7005.DNG, DRAWING NUMBER B7-005-220647, REVISION A, ISSUE NO. 2, DATED AUGUST 30, 1996. FILE PROVIDED BY THE DOW CHEMICAL COMPANY, CONTINENTAL OPERATIONS, HANGING ROCK, OHIO.

SCALE: 1 Inch = 20 Feet	DESIGNED BY: PA	DATE: 11OCT96	AREA OF EXCAVATION AND CONFIRMATORY SAMPLING LOCATIONS FOR FORMER DRUM STORAGE AREA CLOSURE, AND VOLUNTARY CLOSURE OF PROCESS SEWER LINE PREPARED FOR THE DOW CHEMICAL COMPANY HANGING ROCK FACILITY – IRONTON, OHIO
CONFIDENTIAL-ALL RIGHTS RESERVED-PROPERTY OF	DRAWN BY: KG	DATE: 09JAN97	
Radian Engineering Inc.	CHECKED BY: ML	DATE: 24JAN97	
PITTSBURGH, PENNSYLVANIA 15276	APPROVED BY: AR	DATE: 27JAN97	CONTRACT NO. 007015.70 / FIGURE NO. 3 / REV. 0

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In the Former Drum Storage Area, the actual excavation included the following:

- A section approximately 10 ft long x 4 ft wide x 15 ft depth;
- A section approximately 20 ft long x 4 ft wide x 14 ft depth; Area of Excavation and Confirmatory Sampling Locations for Former Drum Storage Area Closure, and Voluntary Closure of Process Sewer Line;
- A section approximately 20 ft long x 4 ft wide x 12 ft depth; and
- A discretionary surficial excavation at three locations of approximately 4 ft long x 4 ft wide x 2 ft depth, each pursuant to good engineering practice.

This corresponds to approximately 150 tons which were disposed of as hazardous waste.

The section of the process sewer line underlaying the Former Drum Storage Area was also removed and disposed off-site.

Post-excavation soil samples were collected and sent for laboratory analysis with a turnaround time of 48 hours. The laboratory results addressed in Section 3.2 were evaluated to determine compliance with the residential soil cleanup standard in Table 2. Areas that exhibited concentrations of constituents below the cleanup criteria were considered "clean", while areas that exhibited concentrations of constituents higher than the cleanup criteria were subjected to additional excavation. A second round of soil samples were collected at the completion of the additional excavation and were sent off-site for laboratory analysis. Once the results were below the cleanup criteria concentrations, the grid area was considered clean. This process was applied to all areas that were excavated until a determination was made that constituent concentrations in soil met the cleanup objectives.

This procedure led to an additional excavation of approximately 18 tons of soil from the Former Drum Storage Area and sections of the process sewer line. The areas that required additional excavation were approximately 120 feet and 160 feet to the south of manhole No. 3 along the process sewer line. The excavation depths in these areas increased from an average of 12 feet to a depth of 14 to 16 feet. Additional excavation was also required from the right side

wall approximately 120 feet to the south of manhole No. 3 along the process sewer line. The areas that were subjected to additional excavation were resampled. The concentration of constituents in soil samples collected from these areas were found "clean", i.e., below the cleanup standards.

3.2 Post-Excavation Sampling and Analysis

Excavation continued until all soil sample results met the residential cleanup levels for soil (Table 2). The post-excavation sampling grid was in accordance with the Ohio EPA Approved Amended Closure Plan. The collection of soil samples included 20-foot grid increments as follows:

- One sample from the bottom or near the bottom of the excavation and one sample each from each side wall of the excavation.

In addition, one sample was collected from the bottom of each discretionary surficial excavation area.

The approximate sampling locations are shown on Figure 3. Samples were designated as follows:

- Site Identification – DHR (Dow Hanging Rock);
- Sample No. – CS (confirmatory soil sampling) followed by a numerical number, for example, 1 stands for sample No. 1;
- Sample location designated by letters RS for right side wall, LS for left side wall, and B for bottom sample. (Left side wall is the east side of the excavation and right side wall is the west side of the excavation);
- Distance from manhole No. 3, for example, 200 means 200 feet to the south from manhole No. 3;
- Sample location for samples collected from a discretionary excavation area by letters RA for remedial action followed by location number, for example 1, and the depth, for example, 2 feet;

- Sample depth designated by the number of feet, for example, B 120-16 means bottom sample at 120 feet south of manhole No. 3 at a depth of 16 feet, RS 120-6 means right or western side wall sample at 120 feet south of manhole No. 3 at a depth of 6 feet;

- Sample collection date including month, day and year, for example, 102496 means October 24, 1996; and

- DUP stands for duplicate sample, i.e., quality control sample.

For example, DHR-CS-39-RS-220-10-102496 means: Dow Hanging Rock Confirmatory Sample No. 39, Right or Western Side Wall, 220 feet south of manhole No. 3, to a depth 10 feet, sampled October 24, 1996.

Samples that were collected from areas that required additional excavation and resampling were identified instead of DHR-CS..., as DHR CRS, i.e., confirmatory resampling.

A total of 20 post-excavation soil samples were collected from the Former Drum Storage Area. This included:

- Three (3) samples (right and left side walls and bottom) at each of the four (4) sampling grid distances, 120, 140, 160 and 180 feet south of manhole No. 3, i.e., a total of 12 samples;

- Three (3) samples following an additional soil excavation at areas that exceeded the soil cleanup levels in Table 2. This included excavation of the right side wall and the bottom of the excavation ditch approximately 120 feet south of manhole No. 3. The bottom of the ditch was excavated from 120 feet south of manhole No. 3 to approximately 160 feet south of manhole No. 3 to an average depth of 14 or 15 feet. The estimated additional excavation resulted in 18 tons of soil;

- Three (3) samples from surficial discretionary excavation that was performed pursuant to good engineering practices; and

- Two (2) Quality Assurance (QA)/Quality Control (QC) samples.

The sampling locations, QA/QC and sample handling procedures, and laboratory analysis were in accordance with Sections 4.4 and 4.7 of the Amended Closure Plan[1]. The soil samples

were analyzed in accordance with the U.S. EPA SW-846 Test Method 8260 for acrylonitrile (AN), ethylbenzene (EB), styrene (ST), and methylene chloride (MC).

Results of the analysis are summarized in Table 3. Laboratory data sheets containing results of all post-excavation sample analysis including data validation letters are included in Appendix C. These validation letters also include chemical analytical results reported by the laboratory for samples collected for sections of the process sewer line which were closed voluntarily.

The data reported on the laboratory data sheets and subsequently in Table 3 show that the post-excavation constituent concentrations remaining in soil including those of the resampled locations are below the residential soil cleanup levels in Table 2. The data in Table 3 show that the soil in the Former Drum Storage Area was cleaned in accordance with the cleanup requirements in the Approved Amended Closure Plan.

3.3 Transportation and Disposal

Excavated soil was transported for offsite disposal by:

Wills Trucking Inc.
3185 Columbus Road
Richfield, Ohio 44286

The transportation was done in accordance with applicable state and federal requirements. Soil that was classified as hazardous waste was disposed of at the:

Michigan Disposal Inc.
49350 N, I-94 Service Drive
Bellville, Michigan 48111

and soil that was classified as non-hazardous was disposed of at the:

Wayne Disposal-Canton Inc.
Sauk Trail Hills Landfill
Soll S. Lilly Road
Canton, Michigan 48188

Table 3. Post-Excavation Soil Analysis and the Applicable Cleanup Standards
Former Drum Storage Area Closure
Dow, Hanging Rock Plant

Sample Identification	Constituent Concentration in Soil (mg/kg) for the Indicated Sampling Grid Location			
	Acrylonitrile**	Ethyl Benzene	Styrene	Methylene Chloride
DHR-CS19-LS120-6-102396*	ND	120	110	ND
DHR-CS20-B120-10-102396*	ND	6200	1400	ND
DHR-CRS8-B120-16-102996*	ND	23***	12***	ND
DHR-CS21-RS120-6-102396	ND	890	250	ND
DHR-CRS9-RS120-10-102996	ND	0.036***	ND	ND
DHR-CS22-LS140-6-102396	ND	32	3.7	ND
DHR-CS23-B140-12-102396	ND	4.9	1.3	ND
DHR-CS24-RS140-6-102396	ND	2.31	ND	ND
DHR-CS25-LS160-6-102396	ND	2.7	ND	ND
DHR-CS26-B160-102396	ND	520	ND	ND
DHR-CRS1-B160-14-102996	ND	ND***	ND	ND
DHR-CS27-RS160-6-102396	ND	10	2.1	ND
DHR-CS28-LS180-6-102496*	ND	39	23	ND
DHR-CS29-B180-102496*	ND	ND	ND	ND
DHR-CS30-RS180-6-102496*	ND	6.4	1.9	ND
DHR-CS31-RA1-2-102496	ND	4.6	4.7	ND

* These samples were collected approximately 5 feet north of the Former Drum Storage Area and approximately 2 feet to the south. They are included here to show that the cleanup levels were achieved also to the north and south of the closure area.

** Acrylonitrile has been quantified and qualified between the method detection limit of 2.22 μg/kg and the reporting limit. Any positive results below the reporting limit have been reported with a "J" flag. The non-presence of the "J" flag indicates the target analyte is not present between the MDL multiplied by the dilution factor and the reported limit.

*** Samples that were collected from locations where additional excavation and resampling were required, because constituent(s) concentration(s) in soil exceeded the cleanup levels in Table 2.

Table 3. Post-Excavation Soil Analysis and the Applicable Cleanup Standards
Former Drum Storage Area Closure
Dow, Hanging Rock Plant (Continued)

Sample Identification	Constituent Concentration in Soil (mg/kg) for the Indicated Sampling Grid Location			
	Acrylonitrile**	Ethyl Benzene	Styrene	Methylene Chloride
DHR-CS32-RA2-6-102496	ND	ND	ND	ND
DHR-CS33-RA3-6-102496	ND	ND	ND	ND
DUP#1	ND	10	1.8	ND
DUP#2	ND	11	1.2	ND
Industrial Land Use Cleanup Standards (mg/kg)	2.5	400	1200	50
Residential Land Use Cleanup Standards (mg/kg)	1.0	400	450	20

* These samples were collected approximately 5 feet north of the Former Drum Storage Area and approximately 2 feet to the south. They are included here to show that the cleanup levels were achieved also to the north and south of the closure area.

** Acrylonitrile has been quantified and qualified between the method detection limit of 2.22 μg/kg and the reporting limit. Any positive results below the reporting limit have been reported with a "J" flag. The non-presence of the "J" flag indicates the target analyte is not present between the MDL multiplied by the dilution factor and the reported limit.

*** Samples that were collected from locations where additional excavation and resampling were required, because constituent(s) concentration(s) in soil exceeded the cleanup levels in Table 2.

As stated in Section 3.1, the total soil excavated from the Former Drum Storage Area, approximately 150 tons, was disposed of as hazardous waste, although approximately half of this quantity which came from the sides and below the process sewer line area and could be disposed as non-hazardous waste. This non-hazardous waste classification is based on the October 17, 1996 letter from Ohio EPA to Dow stating that soil associated with the process sewer line is considered non-hazardous. The disposal of the soil excavated from the Former Drum Storage Area as hazardous waste was based on a Dow management decision as a conservative measure. The only non-hazardous disposal from this area was approximately 4 tons of process sewer line debris.

Appendix D includes the certificates of disposal and associated manifests for the soil disposed as hazardous waste. This includes approximately 150 tons from the Former Drum Storage Area and approximately 216 tons of soil which was excavated along sections of the process sewer line to the north and south of this area.

Soil sample were collected for waste characterization prior to the initiation of closure activities. These samples were collected from the area that exhibited the highest measured constituent concentrations in previous site investigations. Results of the waste characterization are included in Appendix E. These results show that the soil is characterized non-hazardous.

3.4 Area Restoration

The excavated area in the Former Drum Storage Area was restored at the completion of the construction of the new collection sump and the replacement of a section of the process sewer line.

Restoration activities included backfilling with clean soil and compaction of the soil. Clean soil was obtained from two sources:

- Off-site river bed clean soil; and
- On-site clean soil.

The onsite clean soil came from the soil excavation for the collection sump installation. A total of 18 soil samples were collected and analyzed for AC, EB, ST, and MC. The sampling grid is shown in Figure 3. Sample designation included:

- Site identification – DHR (Dow Hanging Rock);
- Sample number – consists of two digits, for example: 64;
- Sample depth – consists of two digits, for example: 34 for sample depth between 3 to 4 feet and 89 for sample depth between 8 to 9 feet; and
- Sample collection date including month, day, and year.

Results of the laboratory analysis are summarized in Table 4 showing that except for one location that exhibited minute concentrations of acrylonitrite (approximately 5 μg/kg), none of the analyzed constituents were detected in the soil. Appendix F includes the laboratory data sheets and a validation letter. Based on these results, the decision was made to use the soil to be excavated during the construction of the collection sump as a backfill material during the closure of the Former Drum Storage Area and sections of the process sewer line.

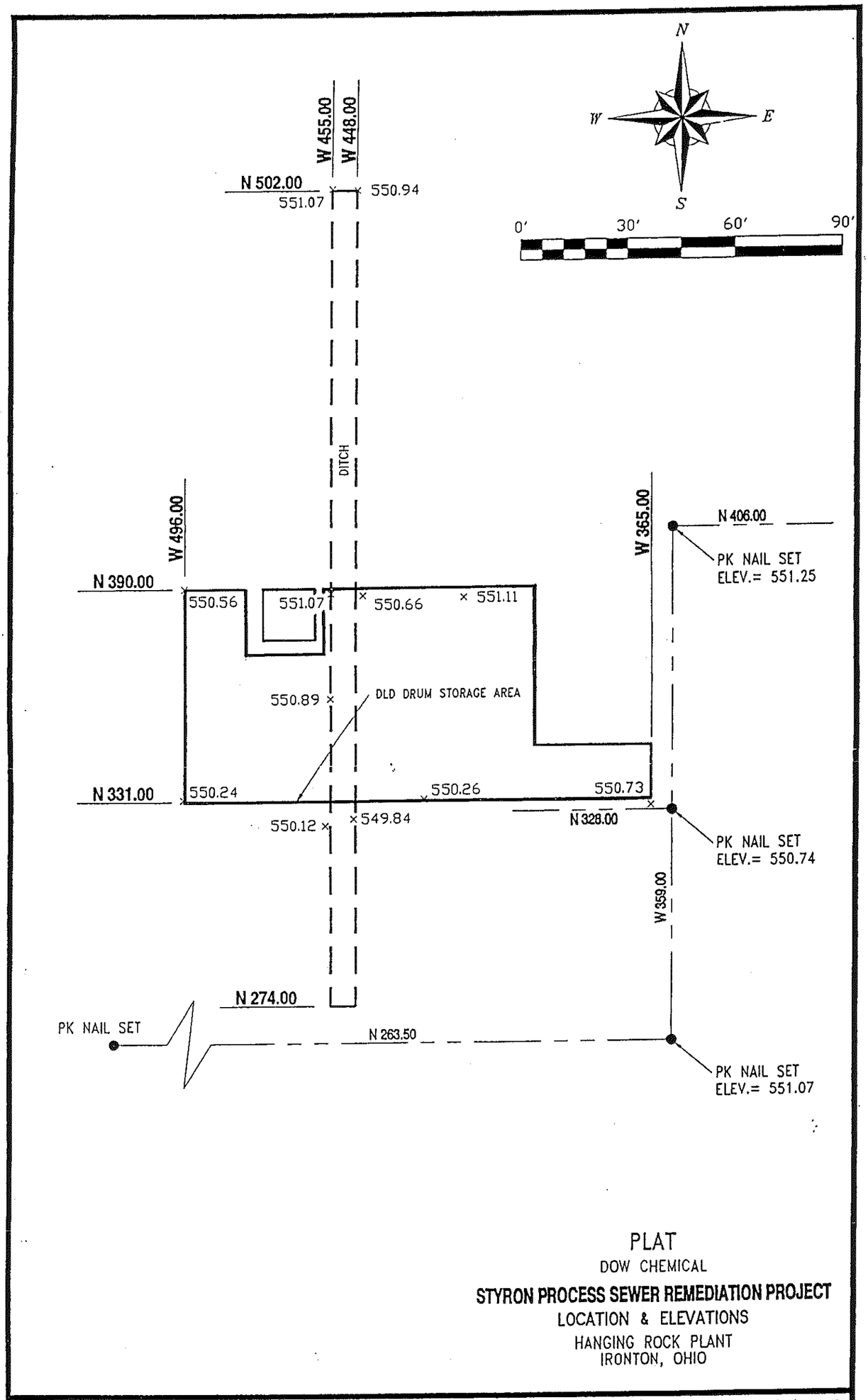
The area that was restored and closed was surveyed by a professional surveyor. This includes the Former Drum Storage Area and sections of the process sewer line to the north and south of this area. Figure 4 is a copy of the survey plat.

Table 4. Laboratory Results of Soil Samples Analysis for the Collection Sump Area Dow, Hanging Rock Plant

Sample Identification	Constituent Concentration in Soil (mg/kg) for Indicated Sampling Grid Locations			
	Acrylonitrile	Ethyl Benzene	Styrene	Methylene Chloride
DHR-64-34-101696	ND	ND	ND	ND
DHR-64-89-101696	ND	ND	ND	ND
DHR-65-34-101696	ND	ND	ND	ND
DHR-65-89-101696	0.0049*	ND	ND	ND
DHR-66-34-101696	ND	ND	ND	ND
DHR-66-89-101696	ND	ND	ND	ND
DHR-67-34-101696	ND	ND	ND	ND
DHR-67-89-101696	ND	ND	ND	ND
DHR-68-34-101696	ND	ND	ND	ND
DHR-68-89-101696	ND	ND	ND	ND
DHR-69-34-101696	ND	ND	ND	ND
DHR-69-89-101696	ND	ND	ND	ND
DHR-70-34-101696	ND	ND	ND	ND
DHR-70-89-101696	ND	ND	ND	ND
DHR-71-34-101696	ND	ND	ND	ND
DHR-71-89-101696	ND	ND	ND	ND
DHR-72-34-101696	ND	ND	ND	ND
DHR-72-89-101696	ND	ND	ND	ND

* Acrylonitrile has been quantified and qualified between the method detection limit and the reporting limit. Any positive result below the reporting limit have been reported with a "J" flag. The non-presence of the "J" flag indicates the target analyte is not present between the MDL multiplied by the dilution factor and the reported limit.

FILE: \DWGS\DOW\HANGROCK\7015-019 C & P



PLAT
DOW CHEMICAL
STYRON PROCESS SEWER REMEDIATION PROJECT
LOCATION & ELEVATIONS
HANGING ROCK PLANT
IRONTON, OHIO

P.O. Box 220
1606 Dogwood Ridge Road
Wheelersburg, Ohio 45694

PURDOM, KASKEY & ASSOCIATES, INC.
ENGINEERS & SURVEYORS

Phone: (614) 574-2534
Fax: (614) 574-6009

RADIAN INTERNATIONAL LLC

SURVEY PLAT OF THE FORMER DRUM STORAGE AREA CLOSURE AND OF SECTIONS OF THE PROCESS SEWER LINE VOLUNTARY CLOSURE

HANGING ROCK PLANT — IRONTON, OH

CLIENT: THE DOW CHEMICAL COMPANY	JOB NUMBER: 007015.70	
SCALE: AS SHOWN	FIGURE NUMBER 4	REV 0

00 22 11 32 99 77 KK GG

3.5 Independent Closure Certification

An independent registered professional engineer licensed in Ohio:

Dr. Avi N. Patkar, P.E.
P.E. License No. E-45228

performed the closure certification in accordance with Ohio EPA requirements. As stated under OAC 3745-50-401(D):

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Mr. David Shaffer
Site Manager
The Dow Chemical Company

Dr. Avi N. Patkar, P.E. No. E-45228, Ohio
President
ILA Consultants

4.0 References

1. Radian International LLC, *Amended Closure Plan for the Former Drum Storage Area,* Hanging Rock Plant, Ironton, Ohio, Prepared for the Dow Chemical Company, Hanging Rock, Ohio, Project No. 7015-700, July, 1996.

2. Ohio EPA, *Closure Plan Review Guidance for RCRA Facilities*, Interim Final, September 1, 1993.

3. U.S. EPA Soil Screening Guidance, Technical Background Document EPA/540/R-95/128, May 1996.

APPENDIX A

OHIO EPA APPROVAL LETTER

Amended Closure Plan
Former Drum Storage Area
Dow Hanging Rock Plant

OhioEPA
State of Ohio Environmental Protection Agency

STREET ADDRESS
1800 WaterMark Drive
Columbus, OH 43215-1099

TELE: (614) 644-3020 FAX: (614) 644-2329

MAILING ADDRESS
P.O. Box 1049
Columbus, OH 43216-1049

CLOSURE PLAN APPROVAL

CERTIFIED MAIL

Re: ***CLOSURE PLAN***
Dow Hanging Rock Plant
OHD 039 128 913

September 30, 1996

Mr. Dennis Stanley
The Dow Chemical Company
Hanging Rock Plant
925 County Road 1A
Ironton, Ohio 45638

Dear Mr. Stanley:

On August 9, 1996, the Dow Chemical Company, Hanging Rock Plant, (Dow) submitted to Ohio EPA an amended closure plan for the former drum storage area located at 925 County Road 1A, Ironton, Ohio. An addendum to the amended closure plan was received on September 25, 1996. The amended closure plan was submitted pursuant to Rule(s) 3745-66-12 of the Ohio Administrative Code (OAC) in order to demonstrate that Dow's proposal for closure complies with the requirements of OAC Rules 3745-66-11 and 3745-66-12.

The public was given the opportunity to submit written comments regarding the amended closure plan of Dow in accordance with OAC Rule 3745-66-12. No comments were received by Ohio EPA in this matter.

Based upon review of Dow's submittal and subsequent revisions, I conclude that the amended closure plan for the hazardous waste facility at 925 County Road 1A, Ironton, Ohio, as modified herein, meets the performance standard contained in OAC Rule 3745-66-11 and complies with the pertinent parts of OAC Rule(s) 3745-66-12.

The amended closure plan submitted to Ohio EPA on August 9, 1996 for Dow is hereby approved with the following modification(s):

OHIO E.P.A.

SEP 30 96

ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the original document as filed in the records of the Ohio Environmental Protection Agency.

By: Kara Yoder Date 9/30/96

George V. Voinovich, Governor
Nancy P. Hollister, Lt. Governor
Donald R. Schregardus, Director

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1. Section 3.1.2, Page 3-2, Table 7 of the Addendum to the Amended Closure Plan: This table is hereby stuck from the closure plan as it does not represent the correct soil clean-up levels established for the site. Dow has provided the correct risk-based soil clean-up levels for both an industrial scenario and a residential scenario in Attachment A of the Addendum to the Amended Closure Plan. These values shall be the established soil clean-up levels.

2. The statement in section 3.1.1 of the regarding potential exposure pathways for soil is hereby struck from the text. The inhalation, ingestion, and dermal pathways for soil have been considered when establishing the risk-based standards. A mult-constituent, multi-pathway, cumulative and additive exposure scenario have been used to establish clean-up standards for both the industrial and residential scenario for the site. Any text that indicates otherwise is hereby struck from the text.

Please be advised that approval of this amended closure plan does not release Dow from any responsibilities as required under the Hazardous and Solid Waste Amendments of 1984 regarding corrective action for all releases of hazardous waste or constituents from any solid waste management unit, regardless of the time at which waste was placed in the unit.

Notwithstanding compliance with the terms of the amended closure plan, the Director may, on the basis of any information that there is or has been a release of hazardous waste, hazardous constituents, or hazardous substances into the environment, issue an order pursuant to Section 3734.20 et seq of the Revised Code or Chapters 3734 or 6111 of the Revised Code requiring corrective action or such other response as deemed necessary; or initiate appropriate action; or seek any appropriate legal or equitable remedies to abate pollution or contamination or to protect public health or safety or the environment.

Nothing here shall waive the right of the Director to take action beyond the terms of the amended closure plan pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. §9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499 ("CERCLA") or to take any other action pursuant to applicable Federal or State law, including but not limited to the right to issue a permit with terms and conditions requiring corrective action pursuant to Chapters 3734 or 6111 of the Revised Code; the right to seek injunctive relief, monetary penalties and punitive damages, to undertake any removal, remedial, and/or response action relating to the facility, and to seek recovery for any costs incurred by the Director in undertaking such actions.

Strict compliance with each and every provision of this approved closure plan, especially including the modifications specified herein, is expected. The Ohio EPA will monitor such compliance. The Director expressly reserves the right to take action, pursuant to Chapters 3734 and 6111 of the Revised Code, and other applicable law, to enforce such compliance

OHIO E P A
SEP 30 '96
ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: [signature] Date 9/30/96

and to seek appropriate remedies in the event of noncompliance with the provisions and modifications of this approved closure plan.

You are notified that this action of the Director is final and may be appealed to the Environmental Board of Review pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed with the Environmental Board of Review within thirty (30) days after notice of the Director's action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Board. An appeal may be filed with the Environmental Board of Review at the following address: Environmental Board of Review, 236 East Town Street, Room 300, Columbus, Ohio 43266-0557.

When closure is completed, the Ohio Administrative Code Rule 3745-66-15 requires the owner or operator of a facility to submit to the Director of the Ohio EPA certification by the owner or operator and an independent, registered professional engineer that the facility has been closed in accordance with the approved closure plan. The certification by the owner or operator shall include the statement found in OAC 3745-50-42(D). These certifications should be submitted to: Ohio Environmental Protection Agency, Division of Hazardous Waste Management, Attn: Thomas Crepeau, Data Management Section, P.O. Box 1049, Columbus, Ohio 43216-1049.

Sincerely,

Donald R. Schregardus
Director

dowappSM.ao

cc: Tom Crepeau, DHWM Central File, Ohio EPA
Montee Suleiman, DHWM, Ohio EPA
Harriet Croke, Ohio Permit Section, USEPA - Region V
Michael Moschell, SEDO, Ohio EPA

I certify this to be a true and accurate copy of the original document as filed in the records of the Ohio Environmental Protection Agency.

By: _____ Date 9/30/96

OHIO E.P.A.

SEP 30 96

ENTERED DIRECTOR'S JOURNAL

APPENDIX B

OHIO EPA OPINION LETTER ON DISPOSAL OF SOIL FROM THE SECTION OF A PROCESS SEWER LINE AT THE DOW CHEMICAL COMPANY HANGING ROCK PLANT

OhioEPA
State of Ohio Environmental Protection Agency
Southeast District Office
2195 Front Street
Logan, Ohio 43138-9031
(614) 385-8501
FAX (614) 385-6490

George V. Voinovich
Governor

October 17, 1996

RE: LAWRENCE COUNTY
DOW CHEMICAL
RCRA - ST1,LQG
OHD039128913

Dr. Amiram Roffman
Radian International
Penn Central West
III Building, Suite 300
Pittsburgh, PA 15276

by Fax 412-788-1316

Dear Dr. Roffman:

You requested assistance in determining whether soil from a section of a process sewer line at the Dow Chemical Hanging Rock Plant which contains constituents that appear rule 3745-51-33 of the Ohio Administrative Code (OAC) is designated a listed hazardous waste due to the contained-in policy. The constituents of concern are styrene, ethylbenzene, and acrylonitrile. In summary, upon review of the facility RCRA closure plan and information provided during our conference call of October 16, 1996, we have concluded that the contaminated soil in question does not constitute a listed hazardous waste. Furthermore, using knowledge of the constituents of concern, the soil does not appear to exhibit a hazardous waste characteristic. Therefore, the soil may be disposed of at a non-hazardous waste disposal facility.

The information that you provided indicates that the DOW Chemical plant manufactures polymeric beads and foams. Raw materials used in the production of these products include liquid styrene, ethylbenzene, and acrylonitrile. A thorough investigation of the contaminated area in question was performed. Per this investigation, it was determined that an underground process sewer pipe, leading to a non-hazardous wastewater collection sump released process wastewater into the soil. The process wastewater was not a listed hazardous waste.

According to the contained-in policy, soil can only be designated a listed hazardous waste when contaminated by a listed hazardous waste (F or K waste code), an unused or off-specification commercial chemical product that appears in OAC rule 3745-51-33, or a chemical formulation that contains as the sole active ingredient a material that appears in OAC rule 3745-51-33 (P or U waste code). Per the information you provided, the material that contaminated the soil does not fit this criteria. Therefore, the contaminated soil is not a listed hazardous waste.

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Per OAC rule 3745-52-11, the generator of a waste is responsible for determining if the material exhibits a characteristic of a hazardous waste as defined in OAC rules 3745-51-21 to 3745-51-24. This determination may be accomplished using process knowledge or analytical methods. Using knowledge of the constituents of concern, it is concluded that the soil does not exhibit a characteristic of a hazardous waste.

Given the above, the soil does not contain a hazardous waste and may be disposed of into a non-hazardous waste disposal facility.

If you have additional questions or if we may be of further assistance, please do not hesitate to contact Mike Moschell at (614) 385-8501 or Karen Hale at (614) 644-2934.

Sincerely,

Mike Moschell

Mike Moschell
Inspector
Division of Hazardous Waste Management

M Moschell for

Karen L. Hale
Technical Support Unit
Division of Hazardous Waste Management, CO

MM/KLH/jg

cc: Dave Chenault, DHWM, SEDO
Jeff Mayhugh, DHWM, CO
Wendy Miller, DHWM, CO

APPENDIX C

POST-EXCAVATION SOIL LABORATORY ANALYSIS

SUMMARY DATA

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **04** Collected: **10/23/96 1550**
Sample Description: **DHR-CS19-LS120-6-102396** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 5RA21449
Instrument: FINN5 Injected: 10/25/96 Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
100-41-4	Ethyl benzene	120000D	770
107-13-1	Acrylonitrile	ND, (A)	1500
100-42-5	Styrene	110000D	770
75-09-2	Methylene chloride	ND	770

SURROGATES:

Dibromofluoromethane	95 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	80 % Recovery	(80% - 120%)
Toluene-d8	96 % Recovery	(81% - 117%)
p-Bromofluorobenzene	100 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

D = The analyte was quantified at a secondary dilution factor
ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **05** Collected: **10/23/96 1600**
Sample Description: **DHR-CS20-B120-10-102396** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 5RA21420
Instrument: FINN5 Injected: 10/25/96 Factor: 12500 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
100-41-4	Ethyl benzene	6200000D	77000
107-13-1	Acrylonitrile	ND, (A)	150000
100-42-5	Styrene	1400000	77000
75-09-2	Methylene chloride	ND	77000

SURROGATES:

Dibromofluoromethane	DL % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	DL % Recovery	(80% - 120%)
Toluene-d8	DL % Recovery	(81% - 117%)
p-Bromofluorobenzene	DL % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

D = The analyte was quantified at a secondary dilution factor
ND = Not detected at or above the reporting limit
(A) = See the report comments
DL = Diluted out

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **06** Collected: **10/23/96 1610**
Sample Description: **DHR-CS21-RS120-6-102396** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 5RA21421
Instrument: FINN5 Injected: 10/25/96 Factor: 12500 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
100-41-4	Ethyl benzene	890000	77000
107-13-1	Acrylonitrile	ND, (A)	150000
100-42-5	Styrene	250000	77000
75-09-2	Methylene chloride	ND	77000

SURROGATES:

Dibromofluoromethane	DL	% Recovery	(80% - 120%)
1,2-Dichloroethane-d4	DL	% Recovery	(80% - 120%)
Toluene-d8	DL	% Recovery	(81% - 117%)
p-Bromofluorobenzene	DL	% Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments
DL = Diluted out

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **07** Collected: **10/23/96 1710**
Sample Description: **DHR-CS22-LS140-6-102396** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 5RA21439
Instrument: FINN5 Injected: 10/25/96 Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
100-41-4	Ethyl benzene	32000D	770
107-13-1	Acrylonitrile	ND, (A)	1500
100-42-5	Styrene	3700	770
75-09-2	Methylene chloride	ND	770

SURROGATES:

Dibromofluoromethane	88 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	83 % Recovery	(80% - 120%)
Toluene-d8	99 % Recovery	(81% - 117%)
p-Bromofluorobenzene	95 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

D = The analyte was quantified at a secondary dilution factor
ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **08** Collected: **10/23/96 1720**
Sample Description: **DHR-CS23-B140-12-102396** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 5RA21440
Instrument: FINN5 Injected: 10/25/96 Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
100-41-4	Ethyl benzene	4900	750
107-13-1	Acrylonitrile	ND, (A)	1500
100-42-5	Styrene	1300	750
75-09-2	Methylene chloride	ND	750

SURROGATES:

Dibromofluoromethane	89 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	82 % Recovery	(80% - 120%)
Toluene-d8	97 % Recovery	(81% - 117%)
p-Bromofluorobenzene	91 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **09** Collected: **10/23/96 1730**
Sample Description: **DHR-CS24-RS140-6-102396** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 5RA21441
Instrument: FINN5 Injected: 10/25/96 Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
100-41-4	Ethyl benzene	2300	760
107-13-1	Acrylonitrile	ND, (A)	1500
100-42-5	Styrene	ND	760
75-09-2	Methylene chloride	ND	760

SURROGATES:

Dibromofluoromethane	98 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	86 % Recovery	(80% - 120%)
Toluene-d8	104 % Recovery	(81% - 117%)
p-Bromofluorobenzene	98 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **10** Collected: **10/23/96 1745**
Sample Description: **DHR-CS25-LS160-6-102396** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 5RA21442
Instrument: FINN5 Injected: 10/25/96 Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
100-41-4	Ethyl benzene	2700	760
107-13-1	Acrylonitrile	ND, (A)	1500
100-42-5	Styrene	ND	760
75-09-2	Methylene chloride	ND	760

SURROGATES:

Dibromofluoromethane	99 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	82 % Recovery	(80% - 120%)
Toluene-d8	96 % Recovery	(81% - 117%)
p-Bromofluorobenzene	102 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-CS26-B160-102396**
Test Description: **Special List - 8260**

Lab No: **11**

Collected: **10/23/96 1755**
Category: **Soil**
Method: **8260**

Analyst: MBJ
Instrument: FINN5 Injected: 10/25/96

File: 5RA21426
Factor: 12500 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
100-41-4	Ethyl benzene	520000	76000
107-13-1	Acrylonitrile	ND, (A)	150000
100-42-5	Styrene	ND	76000
75-09-2	Methylene chloride	ND	76000

SURROGATES:

Dibromofluoromethane	DL % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	DL % Recovery	(80% - 120%)
Toluene-d8	DL % Recovery	(81% - 117%)
p-Bromofluorobenzene	DL % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments
DL = Diluted out

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **12** Collected: **10/23/96 1805**
Sample Description: **DHR-CS27-RS160-6-102396** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 5RA21443
Instrument: FINN5 Injected: 10/25/96 Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
100-41-4	Ethyl benzene	10000	770
107-13-1	Acrylonitrile	ND, (A)	1500
100-42-5	Styrene	2100	770
75-09-2	Methylene chloride	ND	770

SURROGATES:

Dibromofluoromethane	88 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	80 % Recovery	(80% - 120%)
Toluene-d8	104 % Recovery	(81% - 117%)
p-Bromofluorobenzene	84 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **13** Collected: **10/23/96**
Sample Description: **DUP#1** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 5RA21444
Instrument: FINN5 Injected: 10/25/96 Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
100-41-4	Ethyl benzene	10000	760
107-13-1	Acrylonitrile	ND, (A)	1500
100-42-5	Styrene	1800	760
75-09-2	Methylene chloride	ND	760

SURROGATES:

Dibromofluoromethane	99 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	81 % Recovery	(80% - 120%)
Toluene-d8	101 % Recovery	(81% - 117%)
p-Bromofluorobenzene	95 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DUP#2**
Test Description: **Special List - 8260**

Lab No: **14**

Collected: **10/23/96**
Category: **Soil**
Method: **8260**

Analyst: MBJ
Instrument: FINN5 Injected: 10/25/96

File: 5RA21446
Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
100-41-4	Ethyl benzene	11000	760
107-13-1	Acrylonitrile	ND, (A)	1500
100-42-5	Styrene	1200	760
75-09-2	Methylene chloride	ND	760

SURROGATES:

Dibromofluoromethane	98 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	80 % Recovery	(80% - 120%)
Toluene-d8	102 % Recovery	(81% - 117%)
p-Bromofluorobenzene	97 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **01** Collected: **10/24/96**
Sample Description: **DHR-CS28-LS180-6-102496** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: EDG File: 5RD21468
Instrument: FINN5 Injected: 10/26/96 Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
75-09-2	Methylene chloride	ND	760
100-41-4	Ethyl benzene	39000D	760
100-42-5	styrene	23000D	760
107-13-1	Acrylonitrile	ND,(A)	1500

SURROGATES:

Dibromofluoromethane	109 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	105 % Recovery	(80% - 120%)
Toluene-d8	114 % Recovery	(81% - 117%)
p-Bromofluorobenzene	116 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
D = The analyte was quantified at a secondary dilution factor
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **02** Collected: **10/24/96**
Sample Description: **DHR-CS29-B180-102496** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: EDG File: 2RD12330
Instrument: HPMS2 Injected: 10/27/96 Factor: 5 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
75-09-2	Methylene chloride	ND	26
100-41-4	Ethyl benzene	ND	26
100-42-5	Styrene	ND	26
107-13-1	Acrylonitrile	ND, (A)	52

SURROGATES:

Dibromofluoromethane	89 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	89 % Recovery	(80% - 120%)
Toluene-d8	89 % Recovery	(81% - 117%)
p-Bromofluorobenzene	90 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **03** Collected: **10/24/96**
Sample Description: **DHR-CS30-RS180-6-102496** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 5RA21488
Instrument: FINN5 Injected: 10/27/96 Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
75-09-2	Methylene chloride	ND	750
100-41-4	Ethyl benzene	6400	750
100-42-5	Styrene	1900	750
107-13-1	Acrylonitrile	ND,(A)	1500

SURROGATES:

Dibromofluoromethane	113 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	117 % Recovery	(80% - 120%)
Toluene-d8	91 % Recovery	(81% - 117%)
p-Bromofluorobenzene	123RE % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments
RE = Reanalysis confirms sample matrix interference

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **07** Collected: **10/24/96**
Sample Description: **DHR-CS31-RA1-2-102496** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: EDG File: 4Rd21474
Instrument: FINN5 Injected: 10/26/96 Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
75-09-2	Methylene chloride	ND	720
100-41-4	Ethyl benzene	4600	720
100-42-5	Styrene	4700	720
107-13-1	Acrylonitrile	ND, (A)	1400

SURROGATES:

Dibromofluoromethane	91 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	103 % Recovery	(80% - 120%)
Toluene-d8	105 % Recovery	(81% - 117%)
p-Bromofluorobenzene	109 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **08** Collected: **10/24/96**
Sample Description: **DHR-CS32-RA2-2-102496** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: EDG File: 2RD12331
Instrument: HPMS2 Injected: 10/27/96 Factor: 5 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
75-09-2	Methylene chloride	ND	30
100-41-4	Ethyl benzene	ND	30
100-42-5	Styrene	ND	30
107-13-1	Acrylonitrile	ND,(A)	60

SURROGATES:

Dibromofluoromethane	95 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	94 % Recovery	(80% - 120%)
Toluene-d8	95 % Recovery	(81% - 117%)
p-Bromofluorobenzene	98 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **09** Collected: **10/24/96**
Sample Description: **DHR-CS33-RA3-2-102496** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: EDG File: 2RD12332
Instrument: HPMS2 Injected: 10/27/96 Factor: 5 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
75-09-2	Methylene chloride	ND	30
100-41-4	Ethyl benzene	ND	30
100-42-5	Styrene	ND	30
107-13-1	Acrylonitrile	ND	60

SURROGATES:

Dibromofluoromethane	106 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	100 % Recovery	(80% - 120%)
Toluene-d8	99 % Recovery	(81% - 117%)
p-Bromofluorobenzene	101 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **08** Collected: **10/29/96**
Sample Description: **DHR-CRS8-B120-16-102996** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: EDG File: 5RD21611
Instrument: FINN5 Injected: 11/01/96 Factor: 125 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
75-09-2	Methylene chloride	ND	660
100-41-4	Ethyl benzene	23000D	660
100-42-5	Styrene	12000	660
107-13-1	Acrylonitrile	ND, (A)	1300

SURROGATES:

Dibromofluoromethane	103 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	92 % Recovery	(80% - 120%)
Toluene-d8	101 % Recovery	(81% - 117%)
p-Bromofluorobenzene	96 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
D = The analyte was quantified at a secondary dilution factor
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **09** Collected: **10/29/96**
Sample Description: **DHR-CRS9-RS120-10-103096** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MDA File: 2RD12481
Instrument: HPMS2 Injected: 11/01/96 Factor: 5 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
75-09-2	Methylene chloride	ND	31
100-41-4	Ethyl benzene	36	31
100-42-5	Styrene	ND	31
107-13-1	Acrylonitrile	ND, (A)	62

SURROGATES:

Dibromofluoromethane	104 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	102 % Recovery	(80% - 120%)
Toluene-d8	94 % Recovery	(81% - 117%)
p-Bromofluorobenzene	94 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **01** Collected: **10/29/96**
Sample Description: **DHR-CRS1-B160-14-102996** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MDA File: 2RD12480
Instrument: HPMS2 Injected: 11/01/96 Factor: 5 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
75-09-2	Methylene chloride	ND	33
100-41-4	Ethyl benzene	ND	33
100-42-5	Styrene	ND	33
107-13-1	Acrylonitrile	ND, (A)	66

SURROGATES:

Dibromofluoromethane	97 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	104 % Recovery	(80% - 120%)
Toluene-d8	94 % Recovery	(81% - 117%)
p-Bromofluorobenzene	94 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit
(A) = See the report comments

Order #96-10-392
November 1, 1996 16:19

KEMRON ENVIRONMENTAL SERVICES
REPORT COMMENTS

Acrylonitrile has been quantitated and qualified between the method detection limit of 2.22 ug/kg and the reporting limit. Any positive results below the reporting limit have been reported with a "J" flag. The non-presence of the "J" flag indicates the target analyte is not present between the MDL multiplied by the dilution facter and the reported limit.

RADIAN INTERNATIONAL

MEMORANDUM

To: Amiram Roffman

From: Haia Roffman

Date: February 11, 1997

Subject: **Validation of Soil Samples, VOC results, Dow-Hanging Rock Plant**

Twelve soil samples and two duplicate samples were analyzed for acrylonitrile, ethylbenzene, styrene and methylene chloride by the Kemron Environmental Services Laboratory using Method 8260. The laboratory reported results for the following samples:

DHR-CS16-LS100-6-102396	DHR-CS17-B100-102396
DHR-CS18-RS100-6-102396	DHR-CS19-LS120-6-102396
DHR-CS20-B120-10-102396	DHR-CS21-RS120-6-102396
DHR-CS22-LS140-6-102396	DHR-CS23-B140-12-102396
DHR-CS24-RS140-6-102396	DHR-CS25-LS160-6-102396
DHR-CS26-B160-102396	DHR-CS27-RS160-6-102396
Duplicate of DHR-CS23-B140-12-102396	Duplicate of DHR-CS23-B160-102396

The samples were analyzed within the acceptable holding time period. The method blank and the trip blank were free of the analyzed compounds. The QA/QC results provided by the laboratory are acceptable.

Reported results of the duplicate samples were as follows:

Parameter	DHR-CS23-B140-12-102396	Duplicate	RPD, %
Ethylbenzene µg/kg	4,900	10,000	68.45
Acrylonitrile µg/kg	ND	ND	0
Styrene µg/kg	1,300	1,800	32.25
Methylene Chloride µg/kg	ND	ND	0

	DHR-CS26-B160-102396	Duplicate	RPD, %
Ethylbenzene µg/kg	2,700	11,000	121
Acrylonitrile µg/kg	ND	ND	0
Styrene µg/kg	ND	1,200	200
Methylene Chloride µg/kg	ND	ND	0

PGH-97-HR-099

RADIAN INTERNATIONAL

The samples designated as "duplicates" were actually samples collected individually from approximately the same location. Considering this condition, the relative percent difference (RPDs) between these two sets of samples should be considered acceptable.

Thus, the results reported by the laboratory for these samples are acceptable for their intended use.

HR:tr

RADIAN INTERNATIONAL

MEMORANDUM

To: Amiram Roffman

From: Haia Roffman

Date: February 11, 1997

Subject: **Validation of Soil Samples, VOC results**
Dow-Hanging Rock Plant

Sixteen soil samples (of which one sample was a waste characterization sample) and one duplicate soil sample were analyzed for acrylonitrile, ethylbenzene, styrene and methylene chloride by the Kemron Environmental Services Laboratory using Method 8260. The laboratory reported results for these samples:

DHR-CS28-LS180-6-102496
DHR-CS29-B180-102496
DHR-CS30-RS180-6-102496
DHR-CS34-LS200-10-102496
DHR-CS35-B200-102496
DHR-CS36-RS200-10-102496
DHR-CS31-RA1-2-102496
DHR-CS32-RA2-2-102496
DHR-CS33-RA3-2-102496
DHR-CS37-LS220-10-102496
DHR-CS38-B220-102496
DHR-CS39-RS220-10-102496
DHR-CS40-LS240-10-102496
DHR-CS41-B240-10-102496
DHR-CS42-RS240-10-102496
DHR-WC1-102496
Duplicate of DHR-CS37-LS200-10-102496

The samples were analyzed within the acceptable holding time period. The method blank was free of the analyzed compounds. The QA/QC results provided by the laboratory are acceptable.

The laboratory reported results for the duplicate samples were as follows:

Parameter, $\mu g/kg$	Sample DHR-CS37-LS200-10-102496	Duplicate Sample	RPD, %
Methylene Chloride	ND	ND	0
Ethylbenzene	68	42	47.3
Styrene	ND	ND	0
Acrylonitrile	ND	ND	0

PGH-97-HR-102

The samples designated as "duplicates" were actually individually collected samples from approximately the same location. Considering this condition, the relative percent difference (RPD) between these two samples is acceptable.

Thus, the results reported by the laboratory for these samples are acceptable for their intended use.

HR:tr

RADIAN INTERNATIONAL

MEMORANDUM

To: Amiram Roffman

From: Haia Roffman

Date: February 11, 1997

Subject: **Validation of Soil Samples, VOC results**
Dow-Hanging Rock Plant

Eight soil samples were analyzed for acrylonitrile, ethylbenzene, styrene and methylene chloride by the Kemron Environmental Services Laboratory using Method 8260. The laboratory reported results for the following samples:

DHR-CRS1-B160-14-102996	DHR-CRS2-B200-14-102996
DHR-CRS3-RS200-10-102996	DHR-CRS4-LS60-10-102996
DHR-CRS5-B60-16-102996	DHR-CRS6-RS60-10-102996
DHR-CRS8-B120-16-102996	DHR-CRS9-RS120-10-103096

The samples were analyzed within the acceptable holding time period. The method blank was free of the analyzed compounds. The QA/QC results provided by the laboratory are acceptable.

Thus, the results reported by the laboratory for these samples are acceptable for their intended use.

HR:tr

PGH-97-HR-101

APPENDIX D

CERTIFICATES OF DISPOSAL

Former Drum Storage Area and Areas to the North and to the South

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 4640707

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*

☒ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)

☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Belleville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-592-5329

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 4640708

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*	☒ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)	☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)
ADDRESS:	49350 N. I-94 Service Drive Belleville, Michigan 48111	
PHONE NUMBER:	1-800-592-5489	
FAX NUMBER:	1-800-592-5329	

Authorized Signature: _____

This certificate is to verify the wastes specified on Manifest # 4640709

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*

☒ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)

☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Belleville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-592-5329

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 4640710

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*	☒ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)	☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)
ADDRESS:	49350 N. I-94 Service Drive Belleville, Michigan 48111	
PHONE NUMBER:	1-800-592-5489	
FAX NUMBER:	1-800-592-5329	

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 4640703

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME:
(Please check one)

☒ Michigan Disposal Waste Treatment Plant
(EPA I.D. # MID000724831)

☐ Wayne Disposal, Inc.
(EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Belleville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-592-5329

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 4640702

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*	☒ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)	☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)
ADDRESS:	49350 N. I-94 Service Drive Belleville, Michigan 48111	
PHONE NUMBER:	1-800-592-5489	
FAX NUMBER:	1-800-592-5329	

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 4640711

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*

☑ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)

☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Belleville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-592-5329

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 4648712

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*

☒ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)

☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Belleville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-592-5329

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 464070 P

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME:
(Please check one)

☑ Michigan Disposal Waste Treatment Plant
(EPA I.D. # MID000724831)

☐ Wayne Disposal, Inc.
(EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Belleville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-592-5329

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 464713

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME:
(Please check one)

☒ Michigan Disposal Waste Treatment Plant
(EPA I.D. # MID000724831)

☐ Wayne Disposal, Inc.
(EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Belleville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-592-5329

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 4640704

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*	☒ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)	☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)
ADDRESS:	49350 N. I-94 Service Drive Belleville, Michigan 48111	
PHONE NUMBER:	1-800-592-5489	
FAX NUMBER:	1-800-592-5329	

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 464674

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*

☐ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)

☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Belleville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-592-5329

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 4640718

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*

☒ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)

☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Belleville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-592-5329

Authorized Signature: _____

THE ENVIRONMENTAL QUALITY COMPANY 49350 N. I-94 SERVICE DRIVE BELLEVILLE MICHIGAN 48111

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 7640717

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*	☒ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)	☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)
ADDRESS:	49350 N. I-94 Service Drive Belleville, Michigan 48111	
PHONE NUMBER:	1-800-592-5489	
FAX NUMBER:	1-800-592-5329	

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # 4640715

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: *(Please check one)*

☒ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)

☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Belleville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-592-5329

Authorized Signature: _____

CERTIFICATE OF DISPOSAL

This certificate is to verify the wastes specified on Manifest # MI 4640719

have been properly disposed of in accordance with all local, state and federal regulations.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40 CFR et seq.

FACILITY NAME: (Please check one)

☑ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000714831)

☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Belleville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-592-5329

Authorized Signature:

THE ENVIRONMENTAL QUALITY COMPANY 49350 N. I-94 SERVICE DRIVE BELLEVILLE MICHIGAN 48111

FORM# 820 (3/96)

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
ATT. ☐ DIS. ☐ REJ. ☐ PR. ☐

Failure to file may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12116 MCL.

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. 0 H D 0 3 9 1 2 8 9 1 3 Manifest Document No. 60313

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number MI 4640707

B. State Generator's ID Same

5. Transporter 1 Company Name: Willis Trucking, Inc.

6. US EPA ID Number: O H D 0 6 8 9 1 3 4 0 9

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: M I D 0 0 0 7 2 4 8 3 1

G. State Facility's ID

H. Facility's Phone 313-697-7830

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	HM
a.	X RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) HM	0 0 1	D T	EST. 4 6 6 0 0	P	~~D 0 0 1~~ U 0 0 9 F 0 0 2	H
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
Approval No. 102,96 MW
F and U listed soil
Waste codes applied obtained from Ohio EPA approved RCRA Closure Plan.
13 U waste No. HM

K. Handling Codes for Wastes Listed Above
a/ /
b/ /
c/ /
d/ /

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR; if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: Donald H. Murphy
Signature: Donald H. Murphy
Date (Month Day Year): 10 22 96

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Kenneth Ramsey
Signature: Kenneth Ramsey
Date (Month Day Year): 10 22 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date (Month Day Year)

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Date (Month Day Year)

USE BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MINUTES 800-424-8802 24 HOURS PER DAY.

ALL 3 CENTI

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES, BOX 30039

PR 5110 Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
ATT. ☐ DIS. ☐ REJ. ☐ PR. ☐

Failure to file may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12116 MCL.

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: OHD039128913 — Manifest Document No.: 96035
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640708
B. State Generator's ID: Same

5. Transporter 1 Company Name: Willis Trucking, Inc.
6. US EPA ID Number: OHD006891340 9
C. State Transporter's ID:
D. Transporter's Phone:

7. Transporter 2 Company Name:
8. US EPA ID Number:
E. State Transporter's ID:
F. Transporter's Phone:

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID000724831
G. State Facility's ID:
H. Facility's Phone: 313-697-7830

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
e. X	RQ, Hazardous Waste, Solid, n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) DHM	001	DT	EST. 49720	P	~~D001~~ U009 F002	H
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
Approval No. 102196 MW
F and U listed soil
Waste codes applied obtained from Ohio EPA approved RCRA Closure Plan.
134U - waste No DHM

K. Handling Codes for Wastes Listed Above
a/ /
b/ /
c/ /
d/ /

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR; if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Donald H. Murphy — Signature: Donald H. Murphy — Date: Month 10 Day 23 Year 96

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Don Bock — Signature: Don Bock — Date: Month 10 Day 23 Year 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: — Signature: — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: — Signature: — Date: Month Day Year

GENERATOR — TRANSPORTER — FACILITY

ALL MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN AT 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE CENTER 1-800-424-8802 24 HOURS PER DAY.

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES, BOX 30038

PR 5110 Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
ATT. ☐ DIS. ☐ REJ. ☐ PR. ☐

Failure to file may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12116 MCL.

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. 0 H D 0 3 9 1 2 8 9 1 3 — Manifest Document No. 9 6 0 3 6

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number
MI 4640709

B. State Generator's ID
Same

5. Transporter 1 Company Name
Wills Trucking, Inc.

6. US EPA ID Number
0 H D 0 6 8 9 1 3 4 0 9

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number
M T D 0 0 0 7 2 4 8 3 1

G. State Facility's ID

H. Facility's Phone
313-697-7830

	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID NUMBER).	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a. X	RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) D.H.M	0 0 1 1	D T	EST. 5 0 8 4 0	P	~~D 0 0 1~~ U 0 0 9 F 0 0 1 2	H
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
Approval No. 102196 M.W.
F and U listed soil
Waste codes applied obtained from Ohio EPA approved RCRA Closure Plan.
13 U- Waste No. D.H.M

K. Handling Codes for Wastes Listed Above
a/ /
b/ /
c/ /
d/ /

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR; if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Donald H. Murphy
Signature: Donald H. Murphy
Date: Month 1 Day 0 Year 2 3 9 6

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Ed Porter
Signature: Ed Porter
Date: Month 1 Day 0 Year 2 3 9 6

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Date: Month Day Year

GENERATOR — TRANSPORTER — FACILITY

ALL S. MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MIC. CENTER AT 1-800-434-8802 24 HOURS PER DAY. AT 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES, BOX 30038

PR 5110 Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
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Failure to file may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12116 MCL.

Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: OHD039128913 — Manifest Document No.: 96037
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640710
B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking, Inc.
6. US EPA ID Number: OHD068913409
C. State Transporter's ID:
D. Transporter's Phone:

7. Transporter 2 Company Name:
8. US EPA ID Number:
E. State Transporter's ID:
F. Transporter's Phone:

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID000724831
G. State Facility's ID:
H. Facility's Phone: 313-697-7830

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No. DHM	N/H
a. X	RQ, Hazardous Waste, Solid, n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~ DHM, U009, F002)	001	DT	EST. 49480	P	~~D001~~ U009 F002	H
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
Approval No. 102196 MW
E and U listed soil
Waste codes applied obtained from Ohio EPA approved RCRA Closure Plan.
13 U - Waste No. DHM.

K. Handling Codes for Wastes Listed Above
a/ /
b/ /
c/ /
d/ /

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR; if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Donald H. Murphy — Signature: Donald H. Murphy — Date: Month 10 Day 23 Year 96

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: J. Brian Nollman — Signature: J. Brian Nollman — Date: Month 10 Day 23 Year 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: — Signature: — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: — Signature: — Date: Month Day Year

GENERATOR

TRANSPORTER

FACILITY

ALL SPILLS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN CENTER AT 1-800-424-8802 24 HOURS PER DAY.

EPA Form 8700-22 (Rev. 9/88) — To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES — PR 5110 Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
ATT. ☐ DIS. ☐ REJ. ☐ PR. ☐

Failure to use may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12116 MCL.

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-98

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: OHD039128913 — Manifest Document No.: 96042
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640703
B. State Generator's ID: Same
C. State Transporter's ID:
D. Transporter's Phone:
E. State Transporter's ID:
F. Transporter's Phone:
G. State Facility's ID:
H. Facility's Phone: 313-697-7830

5. Transporter 1 Company Name: Wills Trucking, Inc.
6. US EPA ID Number: OHD068913409

7. Transporter 2 Company Name:
8. US EPA ID Number:

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID000724831

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a. X	RQ, Hazardous Waste, Solid, n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) DHM	001	DT	EST. 45700	P	~~D001~~ U009 F002	H
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
Approval No. 102196 MW 1310 [illegible] No.
F and U listed soil
Waste codes applied obtained from Ohio EPA [illegible] RCRA Closure Plan.

K. Handling Codes for Wastes Listed Above
a/ 1
b/ 1
c/ 1
d/ 1

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR; if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Donald H Murphy — Signature: Donald H. Murphy — Date: Month 10 Day 23 Year 91

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: GREG RASLER — Signature: [signature] — Date: Month 10 Day 23 Year 91

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: — Signature: — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: — Signature: — Date: Month Day Year

GENERATOR — TRANSPORTER — FACILITY

ALL SPILLS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICH[illegible], AT 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE CENTER AT 1-800-424-8802 24 HOURS PER DAY.

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES, BOX 30038, LANSING MI 48909-7538

PR 5 Rev.

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
ATT. ☐ DIS. ☐ REJ. ☐ PR. ☐

Part 21 of Act 451 1994 as amended

Failure to file may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12116 MCL.

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. OHD039128913 Manifest Document No. 96043

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640702

B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking, Inc.

6. US EPA ID Number: OHD068913409

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID000724831

G. State Facility's ID

H. Facility's Phone: 313-697-7830

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a. X	RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (D001, U009, F002) D.H.M.	001	D	EST. 44900	P	D001 U009 F002	H
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
Approval No. 102196 MW 131 [illegible] Waste No.
[illegible] and [illegible] listed soil
[illegible] applied obtained from Ohio EPA [illegible]
[illegible] Plan.

K. Handling Codes for Wastes Listed Above
a/
b/
c/
d/

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199

ERG #31
Certificate of Disposal Required

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Printed/Typed Name: Donald H. Murphy
Signature: Donald H. Murphy
Date: Month 10 Day 23 Year 96

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Mike Spare
Signature: Mike Spare
Date: Month 10 Day 23 Year 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Date: Month Day Year

GENERATOR

TRANSPORTER

FACILITY

ALL INCIDENTS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN AT 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE CENTER 1-800-424-8802 24 HOURS PER DAY.

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION MICHIGAN DEPARTMENT OF NATURAL RESOURCES BOX 30038

PR 5110 Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
ATT. ☐ DIS. ☐ REJ. ☐ PR. ☐

Failure to file may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12116 MCL.

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: OHD039128913 — Manifest Document No.: 96035
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640711

B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking, Inc.
6. US EPA ID Number: OHD068913409

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID000724831

G. State Facility's ID

H. Facility's Phone: 313-697-7830

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a.	X	RQ, Hazardous Waste, Solid, n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) DHM	001	DT	EST. 16200	P	~~D001~~ DHM U009 F002	H
b.								
c.								
d.								

J. Additional Descriptions for Materials Listed Above
Approval No. 102196 MW
F and U listed soil
Waste codes applied obtained from Ohio EPA approved RCRA Closure Plan.
13 W - Waste No. DHM

K. Handling Codes for Wastes Listed Above
a/ /
b/ /
c/ /
d/ /

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR; if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Donald H. Murphy — Signature: Donald H. Murphy — Date: Month 10 Day 23 Year 96

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: STEVE Guthrie — Signature: [signature] — Date: Month 10 Day 23 Year 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in item 19.
Printed/Typed Name — Signature — Date: Month Day Year

GENERATOR

TRANSPORTER

FACILITY

ALL SPILLS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN CENTER 800-424-8802 24 HOURS PER DAY. 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES

PR 5110 Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. OHD039128913 Manifest Document No. 94039

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number
MI 4640712

B. State Generator's ID
Same

5. Transporter 1 Company Name
Wills Trucking, Inc

6. US EPA ID Number
OHD068913409

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number
MID000724831

G. State Facility's ID

H. Facility's Phone
313-697-7830

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER).	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	
a.	X RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII ~~(D001~~, U009, F002) DHM	001	DT	EST. 46280	P	~~D001~~ U009 F002	H
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
Approval No. 182196 MW
F and U-listed soil
Waste codes applied obtained from Ohio EPA approved RCRA Closure Plan.
1304 - Waste No. DHM

K. Handling Codes for Wastes Listed Above
a/ /
b/ /
c/ /
d/ /

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

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Printed/Typed Name: Donald H. Murphy
Signature: Donald H. Murphy
Date: Month 10 Day 23 Year 96

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Scott Bradley
Signature: Scott Bradley
Date: Month 10 Day 23 Year 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Date: Month Day Year

ALL CONTE... MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MIC 1-800-424-8802 24 HOURS PER DAY. AT 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE

GENERATOR

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES
BOX 30038

PR 5110
Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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Form Approved. OMB No. 2050-0039 Expires 9-30-88

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. OHD039128913 Manifest Document No. 910010
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number MI 4640705
B. State Generator's ID Same

5. Transporter 1 Company Name: Willis Trucking, Inc
6. US EPA ID Number: OHD068913401 9
C. State Transporter's ID
D. Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MTD000724831
G. State Facility's ID
H. Facility's Phone 313-697-7830

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	X	RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) D.H.M.	001	DT	EST. 45900	P	~~D001~~ U009 F002 H
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
Approval No. 102196 Mich
F and U listed soil
Waste No. D.H.M.
Handling codes applied obtained from Ohio EPA Approved RCRA Closure Plant

K. Handling Codes for Wastes Listed Above
a/ b/ c/ d/

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

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Printed/Typed Name: Donald H. Murphy
Signature: Donald H. Murphy
Date: Month 10 Day 23 Year 91

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: WILLIAM CRAWFORD
Signature: William Crawford
Date: Month 10 Day 23 Year 91

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Date: Month Day Year

GENERATOR
TRANSPORTER
FACILITY

ALL SPILLS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN AT 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE CENTER AT 1-800-424-8802 24 HOURS PER DAY.

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES, BOX 30038, LANSING, MI 48909-7538

PR 51 Rev. 5

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. OHD039128913 Manifest Document No. 016414
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633
4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640713
B. State Generator's ID: Same
C. State Transporter's ID
D. Transporter's Phone
E. State Transporter's ID
F. Transporter's Phone
G. State Facility's ID
H. Facility's Phone: 313-697-7830

5. Transporter 1 Company Name: Wills Trucking, Inc.
6. US EPA ID Number: OHD068913140 19
7. Transporter 2 Company Name
8. US EPA ID Number

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111
10. US EPA ID Number: MTD000724831

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER).	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a. X	RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) DHM	0011	DT	EST. 43340	P	D001 U009 F002	
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
Contains No. 2 fuel oil and contaminated soil
Waste codes applied obtained from Ohio EPA approved waste analysis plan.
DHM

K. Handling Codes for Wastes Listed Above
a.
b.
c.
d.

15. Special Handling Instructions and Additional Information
ERG #31
Emergency Contact: 703-866-9199
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

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Printed/Typed Name: Donald H. Murphy
Signature: Donald H. Murphy
Date: Month Day Year 10 23 96

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: MARC SNYDER
Signature: Marc Snyder
Date: Month Day Year 10 23 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Date: Month Day Year

GENERATOR
TRANSPORTER
FACILITY

ALL ... MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MIC CENTER AT 1-800-424-8802 24 HOURS PER DAY. AT 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES, BOX 30038

PR 5110 Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. OHD039128913 Manifest Document No. 46047

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640704

B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking, Inc.

6. US EPA ID Number: OHD068913409

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID007242831

G. State Facility's ID

H. Facility's Phone: 313-697-7830

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID NUMBER).	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. X RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) BHM	001	DT	EST. 44620	P	~~D001~~ ~~D009~~ F002 H BHM N/H
b.					
c.					
d.					

J. Additional Descriptions for Materials Listed Above
[illegible] approval no. 10-2196 MW [illegible] 2114 - Waste No. [illegible] BHM [illegible] soil [illegible] applied obtained [illegible] approved RCRA [illegible] Plant

K. Handling Codes for Wastes Listed Above
a/
b/
c/
d/

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

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Printed/Typed Name: Donald H. Murphy
Signature: Donald H. Murphy
Date: Month Day Yea 10 23 91

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Cindy Kolodziej
Signature: Cindy Kolodziej
Date: Month Day Ye 10 23 91

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Ye

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Date: Month Day Y

GENERATOR — TRANSPORTER — FACILITY

ALL SPILLS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIG. 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE CENTER AT 1-800-424-8802 24 HOURS PER DAY.

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES
BOX 30038

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DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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Use print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: OHD039128913 — Manifest Document No.: 96045
2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640714
B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking, Inc.
6. US EPA ID Number: OHD068913409
C. State Transporter's ID:
D. Transporter's Phone:

7. Transporter 2 Company Name:
8. US EPA ID Number:
E. State Transporter's ID:
F. Transporter's Phone:

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID000724831
G. State Facility's ID:
H. Facility's Phone: 313-697-7830

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a.	X	RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) DHM	001	DT	EST. 44180	P	~~D001~~ U009 F002 DHM	H
b.								
c.								
d.								

J. Additional Descriptions for Materials Listed Above
Approval No. JD219610W
F and U listed soil
Waste codes applied obtained from Ohio EPA approved RCRA Closure Plan.
13 U Waste No. DHM

K. Handling Codes for Wastes Listed Above
a/
b/
c/
d/

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

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Printed/Typed Name: Donald H. Murphy — Signature: Donald H. Murphy — Date: Month 10 Day 23 Year 96

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Willard Norman — Signature: Willard Norman — Date: Month 10 Day 23 Year 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name: — Signature: — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: — Signature: — Date: Month Day Year

GENERATOR — TRANSPORTER — FACILITY

ALL SPILLS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN CENTER 800-424-6802 24 HOURS PER DAY. 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE

EPA Form 8700-22 (Rev. 9/88) — To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES — PR 5110 Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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Form Approved. OMB No. 2050-0039 Expires 9-30-98

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. 0 H D 0 3 9 1 2 8 9 1 3 — Manifest Document No. 96045

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640714

B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking, Inc.

6. US EPA ID Number: 0 H D 0 6 8 9 1 3 4 0 9

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: M I D 0 0 0 7 2 4 8 3 1

G. State Facility's ID

H. Facility's Phone: 313-697-7830

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a.	X RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) DHM	0 0 1	DT	EST. 4 4 1 8 0	P	~~D001~~ U009 F002	
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
Approval No. AD2196 MW
Based listed soil
EPA codes applied obtained from Ohio EPA approved RCRA Closure Plan.
1312 Waste No. DHM

K. Handling Codes for Wastes Listed Above
a/
b/
c/
d/

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
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16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

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Printed/Typed Name: Donald H. Murphy — Signature: Donald H. Murphy — Date: Month 1 0 Day 2 3 Year 9 6

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Willard Vernon — Signature: Willard Vernon — Date: Month 1 0 Day 2 3 Year 9 6

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name — Signature — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name — Signature — Date: Month Day Year

GENERATOR — TRANSPORTER — FACILITY

ALL S... MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MIC... CENTER AT 1-800-424-8802 24 HOURS PER DAY. AT 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES, BOX 30038, LANSING, MI 48909-7538

PR 5110 Rev. 5/9

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
ATT. ☐ DIS. ☐ REJ. ☐ PR. ☐

Failure to file may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12118 MCL.

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. OHD039128913 Manifest Document No. 96046

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640718

B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking, Inc.

6. US EPA ID Number: OHD068913409

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID000724831

G. State Facility's ID

H. Facility's Phone: 313-697-7830

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a.	X	RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) DAM	001	DT	EST. 46400	P	~~D001~~ U009 F002	H
b.								
c.								
d.								

J. Additional Descriptions for Materials Listed Above
Approval No. 1021196 MW
F and U listed soil
Waste codes applied [illegible] EPA approved RCRA Closure Plan.
13 U - Waste No
DAM

K. Handling Codes for Wastes Listed Above
a/
b/
c/
d/

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

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Printed/Typed Name: Donald H. Murphy
Signature: Donald H. Murphy
Date: Month 10 Day 23 Year 96

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Bill PARKER
Signature: Bill Parker
Date: Month 10 Day 23 Year 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Date: Month Day Year

GENERATOR

TRANSPORTER

FACILITY

ALL SPILLS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN AT 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE CENTER 800-424-8802 24 HOURS PER DAY.

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION MICHIGAN DEPARTMENT OF NATURAL RESOURCES

PR 5110 Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
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Failure to file may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12116 MCL.

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-86

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. OHD039128913 Manifest Document No. 960446
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633
4. Generator's Phone (614) 533-4035

A. State Manifest Document Number MI 4640718
B. State Generator's ID Same
C. State Transporter's ID
D. Transporter's Phone
E. State Transporter's ID
F. Transporter's Phone
G. State Facility's ID
H. Facility's Phone 313-697-7830

5. Transporter 1 Company Name: Wills Trucking, Inc.
6. US EPA ID Number: OHD068913134 09
7. Transporter 2 Company Name
8. US EPA ID Number

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111
10. US EPA ID Number: MID007243831

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER).	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	J. Waste No.
a.	X RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002)	001	DT	EST. 4644.00	P	~~D001~~ D009 U012
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
Approval No. 10-21-86 MU
Sandy listed soil
Waste Codes applied obtained from Closure Plan.

K. Handling Codes for Wastes Listed Above
a/
b/
c/
d/

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

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Printed/Typed Name: Donald H. Murphy
Signature: Donald H. Murphy
Date: Month 10 Day 23 Year 96

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: Bill PARKER
Signature: Bill Parker
Date: Month 10 Day 23 Year 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Date: Month Day Year

GENERATOR
TRANSPORTER
FACILITY

ALL SPILLS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN AT 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE CENTER AT 1-800-424-8802 24 HOURS PER DAY.

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES
BOX 30038
LANSING MI 48909-7538

PR 5110
Rev. 5/9

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: OHD039128913 — Manifest Document No.: 96047
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640717
B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking, Inc.
6. US EPA ID Number: OHD068913409
C. State Transporter's ID
D. Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID000724831
G. State Facility's ID
H. Facility's Phone: 313-697-7830

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a.	X	RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) DHM	001	DT	EST. 47840	P	~~D001~~ U009 F002	H
b.								
c.								
d.								

J. Additional Descriptions for Materials Listed Above
Approval No. 702196 MIW 1374 - Waste No
F and U listed soil DHM
Waste codes applied obtained from Ohio EPA approved RCRA Closure Plan.

K. Handling Codes for Wastes Listed Above
a/ /
b/ /
c/ /
d/ /

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR; if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Donald H. Murphy — Signature: Donald H. Murphy — Date: Month 10 Day 24 Year 96

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: David McNulty — Signature: David McNulty — Date: Month 10 Day 24 Year 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name — Signature — Date: Month Day Year

GENERATOR

TRANSPORTER

FACILITY

ALL SPILLS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN CENTER 800-424-8802 24 HOURS PER DAY. 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE

EPA Form 8700-22 (Rev. 9/88) — To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES — PR 5110 Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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Part 121 of Act 451, 1994 is amended.

Failure to file may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12116 MCL.

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: OHD039128913 — Manifest Document No.: 96047

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640717

B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking, Inc.

6. US EPA ID Number: OHD068913409

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID000724831

G. State Facility's ID

H. Facility's Phone: 313-697-7830

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER).	HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a.	X	RQ, Hazardous Waste, Solid, n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) DHM	001	DT	EST. 47840	P	~~D001~~ U009 F002 DHM	H
b.								
c.								
d.								

J. Additional Descriptions for Materials Listed Above
[illegible] No. 752196 M 81 [illegible] Waste No
[illegible] listed soil DHM
[illegible] codes applied obtained [illegible] approved RCRA
[illegible] Plan

K. Handling Codes for Wastes Listed Above
a/ -1
b/ -1
c/ -1
d/ -1

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

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Printed/Typed Name: Donald H. Murphy — Signature: Donald H. Murphy — Date: Month 10 Day 24 Year 96

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: David McNulty — Signature: David McNulty — Date: Month 10 Day 24 Year 96

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name — Signature — Date: Month Day Year

GENERATOR — TRANSPORTER — FACILITY

ALL SHIPMENTS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN CENTER, 1-800-424-8802 24 HOURS PER DAY. 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES

PR 5110 Rev. 5/95

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
ATT. ☐ DIS. ☐ REJ. ☐ PR. ☐

Required under authority of Part 111 and Part 121 of Act 451, 1994, as amended.

Failure to file may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12116 MCL.

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-86

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: OHD039128913 — Manifest Document No.: 960418
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640715

B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking
6. US EPA ID Number: OHD068913409

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID000724831

G. State Facility's ID

H. Facility's Phone: 313-697-7830

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No. DHM	N/H
a.	X	RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002) DHM	001	DT	EST. 44120	P	~~D001~~ U009 F002	H
b.								
c.								
d.								

J. Additional Descriptions for Materials Listed Above
Approval No. 102196MW
F and U listed soil
Waste codes applied obtained from [illegible] EPA approved RCRA Closure Plan.
151 U-Waste No DHM

K. Handling Codes for Wastes Listed Above
a/ /
b/ /
c/ /
d/ /

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

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Printed/Typed Name: Donald H. Murphy — Signature: Donald H. Murphy — Date (Month Day Year): 102496

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: WARREN LEHMAN — Signature: [signature] — Date (Month Day Year): 102496

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Date (Month Day Year)

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name — Signature — Date (Month Day Year)

GENERATOR — TRANSPORTER — FACILITY

EPA Form 8700-22 (Rev. 9/88) — To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES — PR 5110

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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ATT. ☐ DIS. ☐ REJ. ☐ PR. ☐

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Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-96

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.: OHD039128913 — Manifest Document No.: 760418
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640715
B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking
6. US EPA ID Number: OHD068913409
C. State Transporter's ID
D. Transporter's Phone

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: MID000724831
G. State Facility's ID
H. Facility's Phone: 313-697-7830

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a. X	RQ, Hazardous Waste, Solid, n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII (~~D001~~, U009, F002)	001	DT	EST. 44120	P	~~D001~~ U009 F002	H
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
[illegible] No. 102496 [illegible] 1814 [illegible]
[illegible] listed soil
[illegible] applied [illegible] Approved [illegible]
[illegible] Plan

K. Handling Codes for Wastes Listed Above
a/ /
b/ /
c/ /
d/ /

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

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Printed/Typed Name: Donald H. Murphy — Signature: Donald H. Murphy — Date: Month Day Year: 10 24 9[illegible]

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: WARREN LEHMAN — Signature: [signature] — Date: Month Day Year: 10 24 9[illegible]

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name — Signature — Date: Month Day Year

GENERATOR — TRANSPORTER — FACILITY

ALL SPILLS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN AT 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE CENTER AT 1-800-424-8802 24 HOURS PER DAY.

EPA Form 8700-22 (Rev. 9/88)

To be mailed by Generator to: WASTE MANAGEMENT DIVISION, MICHIGAN DEPARTMENT OF NATURAL RESOURCES, BOX 30038

PR 51 Rev. [illegible]

DNR WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DO NOT WRITE IN THIS SPACE
ATT. ☐ DIS. ☐ REJ. ☐ PR. ☐

Failure to file may subject you to criminal and/or civil penalties, under Sections 324.11151 or 324.12116 MCL.

Please print or type.

Form Approved. OMB No. 2050-0039 Expires 9-30-86

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. 0 H D 0 3 9 1 2 8 9 1 3 — Manifest Document No. 9 6 0 5 4

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
Dow Chemical Corp., Hanging Rock Plant
925 County Rd. 1A, Ironton, OH 45633

4. Generator's Phone (614) 533-4035

A. State Manifest Document Number: MI 4640719

B. State Generator's ID: Same

5. Transporter 1 Company Name: Wills Trucking, Inc.

6. US EPA ID Number: 0 H D 0 6 8 9 1 3 4 0 9

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
Michigan Disposal, Inc.
49350 N. I-94 Service Drive
Belleville, MI 48111

10. US EPA ID Number: M I D 0 0 0 7 2 4 8 3 1

G. State Facility's ID

H. Facility's Phone: 313-697-7830

	11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.	N/H
a.	X	RQ,Hazardous Waste,Solid,n.o.s. (methylene chloride, acrylonitrile), 9, NA3077, PGIII ~~(D001,~~ U009, F002) DH.M	0 0 1	D T	EST. 3 3 0 8 0	P	~~D 0 0 1~~ U 0 0 9 F 0 0 2	
b.								
c.								
d.								

J. Additional Descriptions for Materials Listed Above
Approval No. 102196 MW
F and U listed soil
Waste codes applied obtained from Ohio EPA approved RCRA Closure Plan.
1310 Waste No. DH.M

K. Handling Codes for Wastes Listed Above
a/ /
b/ /
c/ /
d/ /

15. Special Handling Instructions and Additional Information
Emergency Contact: 703-866-9199
ERG #31
Certificate of Disposal Required

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR: if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Donald H. Murphy — Signature: Donald H. Murphy — Date: Month 1 0 Day 3 0 Year 9 6

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: RODERT WINGARD — Signature: Robert Wingard — Date: Month 1 0 Day 3 0 Year 9 6

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name — Signature — Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name — Signature — Date: Month Day Year

GENERATOR — 1-800-292-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE

TRANSPORTER — IST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHI 800-424-8802 24 HOURS PER DAY.

FACILITY — ALL SP CENTER

EPA Form 8700-22 (Rev. 9/88) To be mailed by Generator to: WASTE MANAGEMENT DIVISION MICHIGAN DEPARTMENT OF NATURAL RESOURCES PR 5110 Rev. 5/95

APPENDIX E

SOIL CHARACTERIZATION LABORATORY RESULTS

EQ - The Environmental Quality Company
49350 N. I-94 Service Drive
Belleville, Michigan 48111

October 16, 1996

Consolidated Env. Options
5765 Burketowne Court
Burke, Virginia 22015

Dear Consolidated Options:

Below are results of analysis of the sample received for examination on October 14, 1996:

Sample I.D. AA06541 CLIENT CODE: 10103
Purchase order number: ERIC Tracking number: 907861
Generator: Dow Chemical Waste Name: SOIL 6-7 FT
Sample collection date: 10/10/96 Time: 17:30
Lab submittal date: 10/14/96 Time: 12:42

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: TCLP METALS--RCRA/MDNR LIST			
SELENIUM	MG/L	Less than	0.10
ARSENIC	MG/L	Less than	0.06
ANTIMONY	MG/L	Less than	0.10
ZINC	MG/L	0.11	0.10
LEAD	MG/L	Less than	0.04
CADMIUM	MG/L	Less than	0.01
BARIUM	MG/L	1.0	0.01
BERYLLIUM	MG/L	Less than	0.0005
CHROMIUM	MG/L	Less than	0.01
COPPER	MG/L	Less than	0.01
SILVER	MG/L	Less than	0.01
NICKEL	MG/L	Less than	0.08
THALLIUM	MG/L	Less than	0.10
MERCURY	MG/L	Less than	0.005
Multicomponent analysis: ORGANIC TCLP-ZHE,BNA,HERBS,PESTS			
1,4-Dichlorobenzene	MG/L	Less Than	0.10
MEK	MG/L	Less Than	0.10
Chloroform	MG/L	Less Than	0.10
Benzene	MG/L	Less Than	0.10
Carbon Tetrachloride	MG/L	Less Than	0.10
1,2-Dichloroethane	MG/L	Less Than	0.10
1,1-Dichloroethylene	MG/L	Less Than	0.20
Vinyl Chloride	MG/L	Less Than	0.10
Trichloroethylene	MG/L	Less Than	0.09
Tetrachloroethylene	MG/L	Less Than	0.05
Chlorobenzene	MG/L	Less Than	0.05
1,4-Dichlorobenzene	MG/L	Less Than	0.50
2,4-Dinitrotoluene	MG/L	Less Than	0.10

TEST PARAMETER	UNITS	TEST RESULT	DETECTION LIMIT
Multicomponent analysis: ORGANIC TCLP-ZHE,BNA,HERBS,PESTS (continued)			
Hexachlorobenzene	MG/L	Less Than	0.10
Hexachloroethane	MG/L	Less Than	0.10
Nitrobenzene	MG/L	Less Than	0.50
Pyridine	MG/L	Less Than	1.0
Hexachlorobutadiene	MG/L	Less Than	0.50
o-Cresol	MG/L	Less Than	10
m-Cresol	MG/L	Less Than	10
p-Cresol	MG/L	Less Than	10
Cresol	MG/L	Less Than	10
Pentachlorophenol	MG/L	Less Than	10
2,4,5-Trichlorophenol	MG/L	Less Than	10
2,4,6-Trichlorophenol	MG/L	Less Than	1
Chlordane	MG/L	Less Than	0.01
Endrin	MG/L	Less Than	0.01
Heptachlor	MG/L	Less Than	0.006
Heptachlor epoxide	MG/L	Less Than	0.006
Lindane	MG/L	Less Than	0.01
Methoxychlor	MG/L	Less Than	1
Toxaphene	MG/L	Less Than	0.3
Silvex	MG/L	Less Than	1
2,4-D	MG/L	Less Than	1
CARBON DISULFIDE	MG/L	Less Than	4.8
METHANOL	MG/L	Less Than	0.75
CYCLOHEXANONE	MG/L	Less Than	0.75

Sample comments:

Sample was received in a glass container at 4' C temperature with no headspace

Please advise should you have questions concerning these data.

Respectfully submitted,

Validation by
Kevin M. Decker
QA/QC Officer

Validation by
Belinda M. Pero
Lab Manager

APPENDIX F

SOIL LABORATORY ANALYSES
COLLECTION SUMP AREA

SUMMARY DATA

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-64-34-101696**
Test Description: **Special List - 8260**

Lab No: **01**

Collected: **10/16/96 2000**
Category: **Soil**
Method: **8260**

Analyst: MBJ
Instrument: HPMS2 Injected: 10/17/96

File: 2RA12179
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	130
75-09-2	Methylene chloride	ND	6.3
100-41-4	Ethyl benzene	ND	6.3
100-42-5	Styrene	ND	6.3

SURROGATES:

Dibromofluoromethane	90 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	85 % Recovery	(80% - 120%)
Toluene-d8	91 % Recovery	(81% - 117%)
p-Bromofluorobenzene	88 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-64-89-101696**
Test Description: **Special List - 8260**

Lab No: **02**

Collected: **10/16/96 2020**
Category: **Soil**
Method: **8260**

Analyst: MBJ
Instrument: HPMS2 Injected: 10/17/96

File: 2RA12180
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	130
75-09-2	Methylene chloride	ND	6.3
100-41-4	Ethyl benzene	ND	6.3
100-42-5	Styrene	ND	6.3

SURROGATES:

Dibromofluoromethane	100 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	93 % Recovery	(80% - 120%)
Toluene-d8	102 % Recovery	(81% - 117%)
p-Bromofluorobenzene	99 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-65-34-101696**
Test Description: **Special List - 8260**

Lab No: **03**

Collected: **10/16/96 2045**
Category: **Soil**
Method: **8260**

Analyst: MBJ
Instrument: HPMS2 Injected: 10/17/96

File: 2RA12181
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	120
75-09-2	Methylene chloride	ND	6.0
100-41-4	Ethyl benzene	ND	6.0
100-42-5	Styrene	ND	6.0

SURROGATES:

Dibromofluoromethane	100 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	96 % Recovery	(80% - 120%)
Toluene-d8	102 % Recovery	(81% - 117%)
p-Bromofluorobenzene	102 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **04** Collected: **10/16/96 2100**
Sample Description: **DHR-65-89-101696** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 2RA12182
Instrument: HPMS2 Injected: 10/17/96 Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	4.9J	120
75-09-2	Methylene chloride	ND	6.2
100-41-4	Ethyl benzene	ND	6.2
100-42-5	Styrene	ND	6.2

SURROGATES:

Dibromofluoromethane	99 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	96 % Recovery	(80% - 120%)
Toluene-d8	102 % Recovery	(81% - 117%)
p-Bromofluorobenzene	100 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

J = Present below nominal detection limit
ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **05** Collected: **10/17/96 0050**
Sample Description: **DHR-66-34-101796** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 2RA12183
Instrument: HPMS2 Injected: 10/17/96 Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	120
75-09-2	Methylene chloride	ND	6.1
100-41-4	Ethyl benzene	ND	6.1
100-42-5	Styrene	ND	6.1

SURROGATES:

Dibromofluoromethane	98 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	95 % Recovery	(80% - 120%)
Toluene-d8	103 % Recovery	(81% - 117%)
p-Bromofluorobenzene	102 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-66-89-101796**
Test Description: **Special List - 8260**

Lab No: **06**

Collected: **10/17/96 0105**
Category: **Soil**
Method: **8260**

Analyst: MBJ
Instrument: HPMS2 Injected: 10/17/96

File: 2RA12184
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	130
75-09-2	Methylene chloride	ND	6.3
100-41-4	Ethyl benzene	ND	6.3
100-42-5	Styrene	ND	6.3

SURROGATES:

Dibromofluoromethane	96 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	93 % Recovery	(80% - 120%)
Toluene-d8	101 % Recovery	(81% - 117%)
p-Bromofluorobenzene	99 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-67-34-101696**
Test Description: **Special List - 8260**

Lab No: **07**

Collected: **10/16/96 2230**
Category: **Soil**
Method: **8260**

Analyst: MBJ
Instrument: HPMS2 Injected: 10/17/96

File: 2RA12185
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	120
75-09-2	Methylene chloride	ND	6.1
100-41-4	Ethyl benzene	ND	6.1
100-42-5	Styrene	ND	6.1

SURROGATES:

Dibromofluoromethane	96 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	95 % Recovery	(80% - 120%)
Toluene-d8	104 % Recovery	(81% - 117%)
p-Bromofluorobenzene	104 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **08** Collected: **10/16/96 2245**
Sample Description: **DHR-67-89-101696** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: MBJ File: 5RA21308
Instrument: FINN5 Injected: 10/18/96 Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	130
75-09-2	Methylene chloride	ND	6.3
100-41-4	Ethyl benzene	ND	6.3
100-42-5	Styrene	ND	6.3

SURROGATES:

Dibromofluoromethane	106 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	101 % Recovery	(80% - 120%)
Toluene-d8	98 % Recovery	(81% - 117%)
p-Bromofluorobenzene	107 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-68-34-101696**
Test Description: **Special List - 8260**

Lab No: **09**

Collected: **10/16/96 2120**
Category: **Soil**
Method: **8260**

Analyst: MBJ
Instrument: FINN5 Injected: 10/18/96

File: 5RA21309
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	120
75-09-2	Methylene chloride	ND	6.0
100-41-4	Ethyl benzene	ND	6.0
100-42-5	Styrene	ND	6.0

SURROGATES:

Dibromofluoromethane	98 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	84 % Recovery	(80% - 120%)
Toluene-d8	107 % Recovery	(81% - 117%)
p-Bromofluorobenzene	110 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-68-89-101696**
Test Description: **Special List - 8260**

Lab No: **10**

Collected: **10/16/96 2135**
Category: **Soil**
Method: **8260**

Analyst: MBJ
Instrument: FINN5 Injected: 10/18/96

File: 5RA21310
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	130
75-09-2	Methylene chloride	ND	6.3
100-41-4	Ethyl benzene	ND	6.3
100-42-5	Styrene	ND	6.3

SURROGATES:

Dibromofluoromethane	107 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	94 % Recovery	(80% - 120%)
Toluene-d8	95 % Recovery	(81% - 117%)
p-Bromofluorobenzene	111 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-69-34-101796**
Test Description: **Special List - 8260**

Lab No: **11**

Collected: **10/17/96 0020**
Category: **Soil**
Method: **8260**

Analyst: MBJ
Instrument: FINN5 Injected: 10/18/96

File: 5RA21311
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	120
75-09-2	Methylene chloride	ND	6.0
100-41-4	Ethyl benzene	ND	6.0
100-42-5	Styrene	ND	6.0

SURROGATES:

Dibromofluoromethane	95 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	92 % Recovery	(80% - 120%)
Toluene-d8	108 % Recovery	(81% - 117%)
p-Bromofluorobenzene	100 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-69-89-101796**
Test Description: **Special List - 8260**

Lab No: **12**

Collected: **10/17/96 0035**
Category: **Soil**
Method: **8260**

Analyst: MBJ
Instrument: FINN5 Injected: 10/18/96

File: 5RA21312
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	130
75-09-2	Methylene chloride	ND	6.3
100-41-4	Ethyl benzene	ND	6.3
100-42-5	Styrene	ND	6.3

SURROGATES:

Dibromofluoromethane	99 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	92 % Recovery	(80% - 120%)
Toluene-d8	105 % Recovery	(81% - 117%)
p-Bromofluorobenzene	114 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **13** Collected: **10/16/96 2305**
Sample Description: **DHR-70-34-101696** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: SLT File: 1RD17111
Instrument: HPMS1 Injected: 10/18/96 Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	120
75-09-2	Methylene chloride	ND	6.1
100-41-4	Ethyl benzene	ND	6.1
100-42-5	Styrene	ND	6.1

SURROGATES:

Dibromofluoromethane	99 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	99 % Recovery	(80% - 120%)
Toluene-d8	100 % Recovery	(81% - 117%)
p-Bromofluorobenzene	97 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **14** Collected: **10/16/96 2315**
Sample Description: **DHR-70-89-101696** Category: **Soil**
Test Description: **Special List - 8260** Method: **8260**

Analyst: SLT File: 1RD17114
Instrument: HPMS1 Injected: 10/18/96 Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	130
75-09-2	Methylene chloride	ND	6.3
100-41-4	Ethyl benzene	ND	6.3
100-42-5	Styrene	ND	6.3

SURROGATES:

Dibromofluoromethane	92 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	89 % Recovery	(80% - 120%)
Toluene-d8	97 % Recovery	(81% - 117%)
p-Bromofluorobenzene	95 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-71-34-101696**
Test Description: **Special List - 8260**

Lab No: **15**

Collected: **10/16/96 2200**
Category: **Soil**
Method: **8260**

Analyst: SLT
Instrument: HPMS1 Injected: 10/18/96

File: 1RD17115
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	120
75-09-2	Methylene chloride	ND	6.1
100-41-4	Ethyl benzene	ND	6.1
100-42-5	Styrene	ND	6.1

SURROGATES:

Dibromofluoromethane	92 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	93 % Recovery	(80% - 120%)
Toluene-d8	96 % Recovery	(81% - 117%)
p-Bromofluorobenzene	93 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-71-89-101696**
Test Description: **Special List - 8260**

Lab No: **16**

Collected: **10/16/96 2210**
Category: **Soil**
Method: **8260**

Analyst: SLT
Instrument: HPMS1 Injected: 10/18/96

File: 1RD17119
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	130
75-09-2	Methylene chloride	ND	6.3
100-41-4	Ethyl benzene	ND	6.3
100-42-5	Styrene	ND	6.3

SURROGATES:

Dibromofluoromethane	92 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	93 % Recovery	(80% - 120%)
Toluene-d8	95 % Recovery	(81% - 117%)
p-Bromofluorobenzene	95 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-72-34-101696**
Test Description: **Special List - 8260**

Lab No: **17**

Collected: **10/16/96 2345**
Category: **Soil**
Method: **8260**

Analyst: SLT
Instrument: HPMS1 Injected: 10/18/96

File: 1RD17117
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	120
75-09-2	Methylene chloride	ND	6.1
100-41-4	Ethyl benzene	ND	6.1
100-42-5	Styrene	ND	6.1

SURROGATES:

Dibromofluoromethane	96 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	98 % Recovery	(80% - 120%)
Toluene-d8	95 % Recovery	(81% - 117%)
p-Bromofluorobenzene	95 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO**
Sample Description: **DHR-72-89-101696**
Test Description: **Special List - 8260**

Lab No: **18**

Collected: **10/16/96 2400**
Category: **Soil**
Method: **8260**

Analyst: SLT
Instrument: HPMS1 Injected: 10/18/96

File: 1RD17118
Factor: 1 Units: ug/kg

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	130
75-09-2	Methylene chloride	ND	6.3
100-41-4	Ethyl benzene	ND	6.3
100-42-5	Styrene	ND	6.3

SURROGATES:

Dibromofluoromethane	99 % Recovery	(80% - 120%)
1,2-Dichloroethane-d4	100 % Recovery	(80% - 120%)
Toluene-d8	103 % Recovery	(81% - 117%)
p-Bromofluorobenzene	102 % Recovery	(74% - 121%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Test Code: **826-SPE-VO** Lab No: **19** Collected: **10/16/96**
Sample Description: **TRIP BLANK** Category: **Water**
Test Description: **Special List - 8260** Method: **8260**

Analyst: SLT File: 1RD17129
Instrument: HPMS1 Injected: 10/21/96 Factor: 1 Units: ug/L

CAS#	COMPOUND	RESULT	REPORTING LIMIT
107-13-1	Acrylonitrile	ND	100
75-09-2	Methylene chloride	ND	5
100-41-4	Ethyl benzene	ND	5
100-42-5	Styrene	ND	5

SURROGATES:

Dibromofluoromethane	103	% Recovery	(86% - 118%)
1,2-Dichloroethane-d4	99	% Recovery	(80% - 120%)
Toluene-d8	106	% Recovery	(88% - 110%)
p-Bromofluorobenzene	107	% Recovery	(86% - 115%)

NOTES AND DEFINITIONS FOR THIS SAMPLE:

ND = Not detected at or above the reporting limit

KEMRON ENVIRONMENTAL SERVICES
REPORT COMMENTS

Acrylonitrile has been quantitated and qualified between the method detection limit of 2.22 ug/kg and the reporting limit. Any positive results below the reporting limit have been reported with a "J" flag. The non-presence of the "J" flag indicates the target analyte is not present between the MDL multiplied by the dilution factor and the reported limit.

AMENDED CLOSURE PLAN
for the
FORMER DRUM STORAGE AREA

HANGING ROCK PLANT
IRONTON, OHIO

PREPARED FOR

THE DOW CHEMICAL COMPANY
HANGING ROCK, OHIO

RADIAN PROJECT NO. 7015-700

RADIAN INTERNATIONAL LLC

July, 1996

RADIAN INTERNATIONAL LLC

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1.0 Introduction

This Plan outlines key elements of the closure activities for the Former Drum Storage Area at the Ohio Hanging Rock Plant. The plant is owned and operated by The Dow Chemical Company (Dow). The Former Drum Storage Area was used for storing 55-gallon drums with ignitable waste from the manufacturing of polymeric beads and foams between 1978 to 1980. Background information including description of plant operations and activities leading up to the Closure Plan are discussed, including constituents concentrations in soil, sources and extent of constituents in soil. Constituents of concern are acrylonitrile (AN), ethylbenzene (EB), methylene chloride (MC), and styrene (ST).

Past Former Drum Storage Area investigations revealed that MC is associated with a surface source, i.e. drum storage activities, and the other three chemicals displayed concentrations at a depth indicating a subsurface source, i.e. the process sewer line underlaying the Former Drum Storage Area.

This proposed Closure Plan addresses constituents concentrations in soil associated with these two sources, although the process sewer line is recognized by the Ohio Environmental Protection Agency (OEPA) as a separate solid waste management unit. This is done to avoid any future need for additional clean-up at the Former Drum Storage Area. Voluntary closure of the process sewer line is discussed in a separate document.

The proposed activities will meet the state of Ohio and the U.S. EPA Resource Conservation and Recovery Act (RCRA) closure intent. Risk-based soil clean-up levels will be utilized and approximately 700 cubic yards of excavated soil will be disposed of in accordance with applicable regulations.

This Closure Plan outlines the key program elements and specifications.

2.0 Site Background

This section provides a summary of plant location and history of the area to be closed, including a short description of plant operations, and activities leading to this closure plan.

2.1 Plant Location

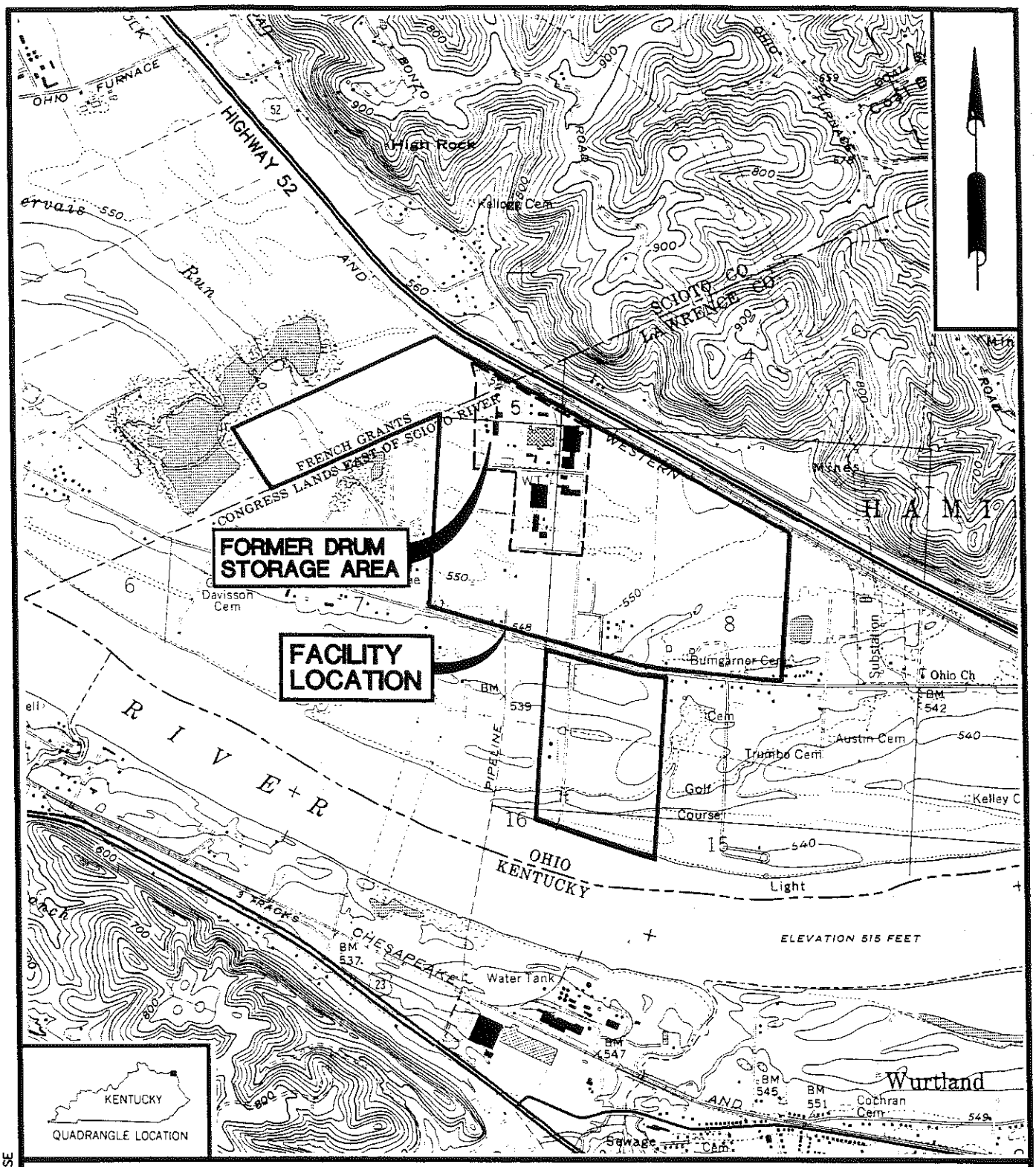
The Dow Hanging Rock Plant is located in Southeastern Ohio, approximately four miles northwest of Ironton (Figure 1). Shown in Figure 1 are the Dow property line and plant area, which occupies only a small portion of property. The plant is located on a 750-acre property in Hamilton Township in southeast Lawrence County. The land use in the vicinity of the facility is predominantly agricultural. The property owned by Dow is bounded to the north by wooded hills beyond State Highway 52, to the south by the Ohio River, to the east by farmland, and to the west by the Lawrence-Scioto County line. The plant itself is immediately surrounded by leased farmland owned by Dow, where com and hay are the predominant crops. The Big Thief Creek flows east to west through the southem portion of Dow's property, joining the Ohio River approximately 1,000 feet outside the property line.

The plant address is:

The Dow Chemical Company
Hanging Rock Plant
Gilruth Lane
Ironton, Ohio 45038

2.2 Description of Plant Operations

The Dow Hanging Rock Plant was constructed in 1957. The plant currently manufactures and ships polymeric beads and foams. Three plants are presently operating at the Hanging Rock Site: the Styron plant, the Styrofoam plant, and the Ethafoam plant. The Styron plant began operations in 1968. The plant produces bulk quantities of high impact polystyrene using the trade name of Styron™, acrylonitrile butadiene styrene (ABS) co-polymer using the trade name Magnum™, and general purpose polystyrene (GP). The products consist of ⅛-inch to ¼-inch beads, and are typically shipped by railcar.



0 2000 4000
SCALE IN FEET

REFERENCE:
BASE MAP IS A PORTION OF THE U.S.G.S. 7.5 MINUTE TOPOGRAPHIC SERIES GREENUP, KY–OHIO QUADRANGLE. DATED: 1972, PHOTOREVISED: 1985. SCALE: 1" = 2000', CONTOUR INTERVAL IS 20 FEET.

FILE: \7015\2000BASE

RADIAN INTERNATIONAL LLC

PLANT LOCATION, PROPERTY LINE AND PLANT AREA

HANGING ROCK PLANT — IRONTON, OHIO

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015	
SCALE: AS SHOWN	FIGURE NUMBER 1		REV 0

0077116299 66KK9G

The Styrofoam plant began operations in 1957. This plant produces polystyrene foam using the trade name Styrofoam™ which has excellent insulating properties and is primarily used by the construction industry. The products range in thickness from ⅛-inch to 3-inches, and have various lengths and widths.

The Ethafoam plant produces polyethylene foam using the trade name Ethafoam™. Ethafoam is a dynamic cushioning material with some elastic properties. It requires further processing from fabricators, one typical use being to protect computers or other shock-sensitive products during shipping. A final Ethafoam product is Seal Sil. It consists of 50-foot, 6-inch-wide rolls of foam, which are used to seal house foundations.

The raw materials used in the production of the plant products include liquid styrene, ethylbenzene, acrylonitrile, polyethylene, various catalysts and blowing agents, and butadiene rubber. The three main operations have the necessary support facilities including process boilers, cooling towers, materials storage and handling, collection sumps, a wastewater treatment system, and miscellaneous auxiliary operations.

In November 1980, Dow submitted a RCRA Part A permit application to the U.S. Environmental Protection Agency (U.S. EPA) Region V for a container storage area with a capacity of 15,000 gallons (72 drums). A Part A interim status authorizing on-site storage of hazardous wastes (D001, F002, and U009) in containers was issued by U.S. EPA in May 1982.

In November 1981, the Ohio Hazardous Waste Facility Approval Board granted Dow an Ohio Hazardous Waste Facility Installation and Operation Permit based on the information in the Part A application.

In December 1985, Dow submitted a RCRA Part B permit application. Revisions to the Part A and B permit applications were made several times since their submittals. Currently the Hanging Rock Plant operates under RCRA interim status.

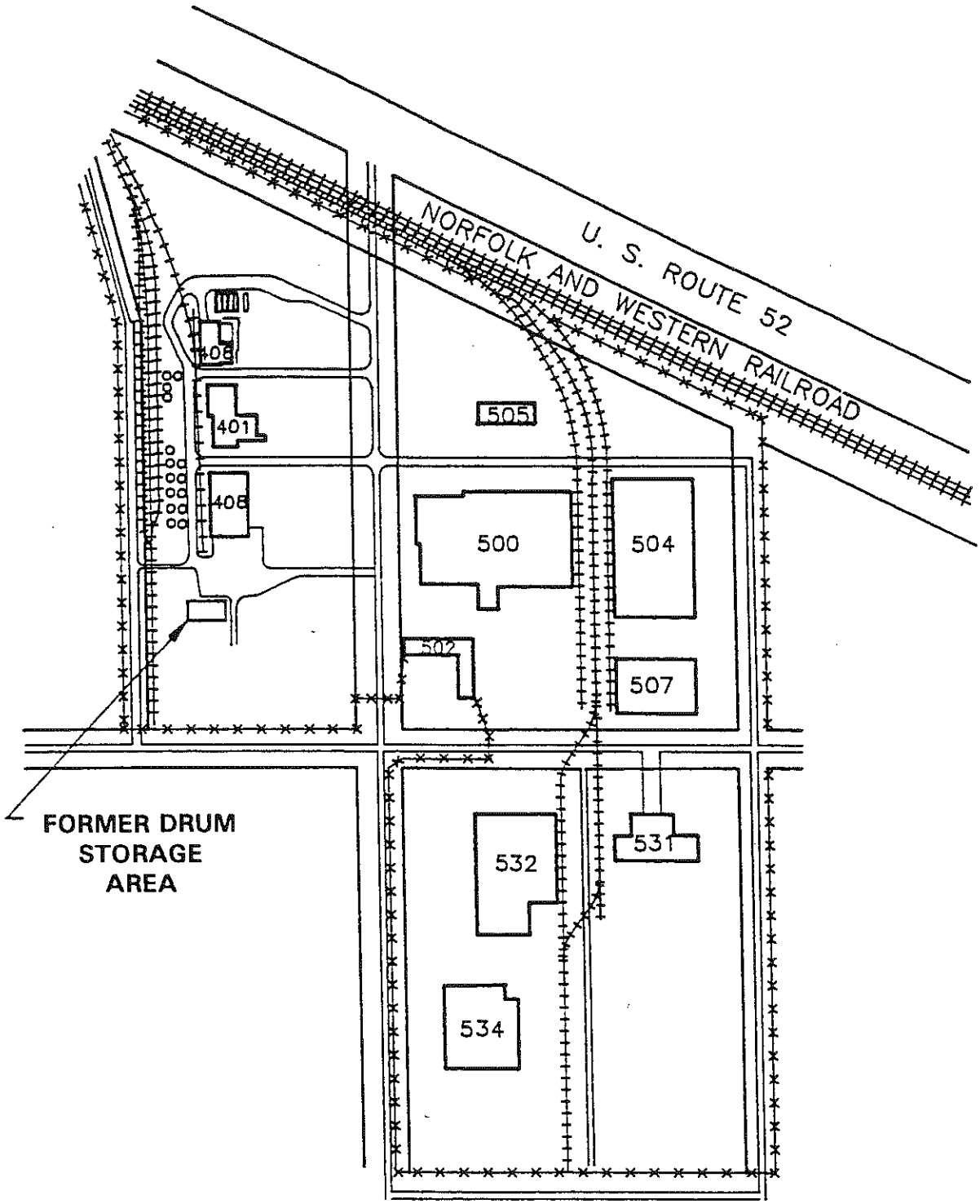
The U.S. EPA performed a preliminary review/site inspection and issued a report in March 1989[1] summarizing results of the review and inspection. The report identifies 43 potential solid waste management units (SWMUs).

2.3 History of the Area to be Closed

One of the SWMUs identified by the U.S. EPA is the former hazardous waste container storage area. It is SWMU № 4 in the 1989 U.S. EPA report[1], and referred to in this plan as the Former Drum Storage Area. This area consists of approximately 50 by 100-foot area to the southwest of the Styron plant. To the north there is an asphalt roadway, a gravel road to the east, and grassy areas are located to the south and west (Figure 2). This area was used between 1978 and 1980 to store 55-gallon drums of ignitable wastes (D001) generated in the polystyrene production area. The drums were stored on wooden pallets. Storage of drums ceased in 1980 and currently the area is covered with grass.

The U.S. EPA 1989 Preliminary Review and Inspection Report states the following for the Former Drum Storage Area[1]:

> "Wastes stored in these drums consisted mostly of liquid ignitable wastes generated in the polystyrene plant. These wastes would have contained styrene, ethylbenzene, and partially polymerized polystyrene. Between 1978 and 1980, the contents of the drums were pumped into trucks and railcars for transport to Dow Midland or the city of Cincinnati Metropolitan Sewer District for incineration. The empty drums were crushed in the area with a backhoe and transported to the Hanging Rock Landfill for deposition. No release controls existed for this unit.
>
> Approximately 50 gallons of styrene, ethylbenzene, and partially polymerized polystyrene were released during disposal processes. The spills were associated with the transfer of waste during clean-up procedures between 1978 and 1980. Contaminated soil was excavated and incinerated at the Dow Midland incinerator."



0 400 800

SCALE IN FEET

NOTE: ONLY MAIN FEATURES ARE SHOWN ON THIS PLAN.

FILE: \7015\2-SHELL

RADIAN INTERNATIONAL LLC

FORMER DRUM STORAGE AREA LOCATION

HANGING ROCK PLANT — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY — JOB NUMBER: 7015-700

SCALE: AS SHOWN — FIGURE NUMBER 2 — REV 0

Constituents identified in the Part A permit application are those found in drums stored in the Former Drum Storage Area. Table 1 provides their names and their waste code identifications.

Table 1. Constituents Listed under the Part A Permit Application Dow Hanging Rock

Constituent Name	Waste Code
Acrylonitrile Ethylbenzene Methylene Chloride Styrene	D001
Methylene Chloride	F002
Acrylonitrile	U009

2.4 Activities Leading to the Closure Plan

On April 26, 1991, the Ohio Environmental Protection Agency (OEPA) issued an order to perform a formal closure for the Former Drum Storage Area. Closure activities were conducted by OHM Remediation Services Corp. (OHM), and Dow Environmental Inc. (DEI), formerly AWD Technologies (AWD). This section provides a summary of activities leading to this closure plan. A chronology of events associated with closure activities for the Former Drum Storage Area is provided in Appendix A. It starts with the use of the area between 1978 and 1980 and continues to the May 1996 EPA letter that led to the preparation of this Closure Plan in July 1996.

2.4.1 Closure Activities

Closure activities were initiated by the OHM Remediation Services Corp (OHM) and started with the development of a closure plan in May 1991[2]. They continued with three-phase investigative activities that were driven by the findings and the need to obtain additional data on constituents concentrations in soil. An Amended Closure Plan was prepared in February 1993[3].

Results were summarized in a Preliminary Report for the RCRA Closure Activities performed at the RCRA Old Drum Storage Area in August 1993[4].

The May 1991 Closure Plan[2] recommended a verification soil sampling program based on the fact that the area was subjected to excavation of soil to mitigate constituents concentrations in soil and that the storage area was not used after 1980. The plan further stated that should the sampling results indicate constituents concentrations in soil, an assessment and/or excavation plan would be prepared. The OEPA approved the Closure Plan on November 4, 1991 (see Appendix B).

The Phase I closure activities were performed in May 1992. A total of 22 soil samples were collected from a 20 ft x 16.7 ft grid intervals, to a depth of up to 1 foot below ground surface (bgs). Soil samples were analyzed for acrylonitrile (AN), ethylbenzene (EB), methylene chloride (MC), and styrene (ST) using the U.S. EPA SW-846 test method 8240. Results of the analysis revealed that EB concentrations at three sampling locations exceeded the method detection limit, with the highest level being 2.76 mg/kg[4].

Results of the Phase I activities led to Phase II activities that were conducted in June 1992. Activities involved the excavation of two 16-foot x 16-foot areas that exhibited gray stained soils and EB concentrations detected under Phase I. Excavation was performed to a depth of 1 to 1.5 feet bgs and resulted in off-site disposal of approximately 35 cubic yards (cy) of soil. Confirmatory soil samples indicated residual levels of EB (9 to 83 mg/kg)[4] and led to the Phase III closure activities. The closure plan was amended to include additional soil investigation. The proposed investigation is summarized in the February 19, 1993 OHM report[3].

Phase III activities were performed in February 1993[4]. Activities included the collection of 72 soil samples from 30 locations at varying depth intervals, up to a depth of 12 feet bgs. These samples were subjected to on-site soil-vapor analysis using mobile laboratory equipped with a laboratory-grade gas chromatograph (GC). Four of the soil samples also were sent off-site for laboratory analysis of AN, EB, MC, and ST using U.S. EPA SW-846 Method 8240. Nine of the locations showed one or more of the four constituents having soil-vapor concentrations above

the method detection limit. The off-site laboratory analysis revealed one or more constituents concentrations above the method detection limit at three of the four sampled locations.[4]

Results of laboratory soil analysis for the three-phases of activities are summarized in Table 2, and results of the Phase III soil-vapor analysis are summarized in Table 3. Figure 3 shows the soil sampling locations for Phase I and II activities, and Figure 4 shows the soil sampling locations for the Phase III activities.

The data for Phase III (see Tables 2 and 3) show that MC was found at locations 49A, 51A, 53A, and 55A. The depth of MC concentrations ranged from 2 to 3 feet at location 55A and from 8 to 9 feet at the other locations.

2.4.2 DEI Closure Activities

At this stage of the program, DEI (formerly AWD Technologies) continued with the closure activities. Cross-sections of soil-gas concentrations along the transect that included sampling locations 49A, 51A, 53A, and 55A (along the process sewer line) were developed utilizing the Phase III data (see Table 3). Figure 5, which includes these cross-sections, illustrates that methylene chloride exhibits a pattern of dispersion that differs from that of the other three chemicals. Whereas methylene chloride concentrations decrease with depth indicating a surface source (i.e. the Former Drum Storage Area), the other three chemicals all display maximum concentrations at a depth (see Table 3, locations 11A, 46A, 49A, 51A, and 53A for examples) indicating a subsurface source (i.e. the process sewer line running underneath the Former Drum Storage Area and to the north of this area at a depth of approximately 8 feet below ground surface).

A pipeline investigation was subsequently performed on July 21, 1993. The study, which is included as Appendix C, indicated that there was evidence that the process sewer line underlying the Former Drum Storage Area could be the source of AN, ST, and EB contamination. OEPA accepted Dow's interpretation of the subsurface contamination source on August 25, 1993 (see Appendix B). At that time, OEPA recommended that Dow submit a Closure Plan Modification. The Closure Plan Modification was submitted in September 1993[5].

Table 2. Concentrations of Constituents Above Detection Limits at the Former Drum Storage Area Dow Hanging Rock Plant

Soil Sampling Location	Depth (ft)	Concentrations of Indicated Constituents (mg/kg)			
		AN	EB	MC	ST
Phase I - May 1992					
8	0-1	<1.25	2.76	<0.500	<0.500
18	0-1	<1.25	0.510	<0.500	<0.500
23	0-1	<1.25	1.29	<0.500	<0.500
Phase II - June 1992					
32	0-1.5	BDL	9	BDL	BDL
36	0-1.5	BDL	9	BDL	BDL
37	0-1.5	BDL	83	BDL	BDL
Phase III - February 1993					
8A-1	8-9	<0.13	<0.005	<0.005	<0.005
20A-1	8-9	<0.13	0.267	<0.005	<0.090
49A-2	5-6	0.106	0.559	1.57	0.051
49A-3	11-12	<0.114	2.16	0.68	0.413

Results preceded by "less than" (<) were below the detection limit of the analytical instrument.

BDL: below method detection limit.
Phase I: included 22 soil sampling locations plus 2 equipment blank, 1 trip blank, and 2 duplicate samples. Only 3 samples resulted with constituents concentrations above the method detection limit.
Phase II: included 3 confirmatory soil sampling locations.
Phase III: included 4 split-soil samples that were subjected to off-site laboratory analysis and 72 soil samples that were subjected to soil GC analyses (see Table 3).

Table 3. Phase III Soil-Gas Constituents Concentrations at the Former Drum Storage Area
Dow Hanging Rock Plant

Depth Below Surface (Ft)	Constituent	Soil-Gas Concentration (ppm) at the Indicated Locations																												
		3A	4A	7A	8A	11A	12A	15A	16A	19A	20A	23A	24A	40A	41A	42A	43A	44A	45A	46A	47A	48A	49A	50A	51A	52A	53A	54A	55A	56A	57A
2 to 3	EB	ND	ND	ND	--	0.701	ND	ND	0.149	0.016	--	ND	ND	ND	ND	ND	ND	ND	ND	0.328	ND	0.023	0.189	ND	0.735	0.224	0.36	0.037	0.42	ND	ND
	AN	ND	ND	ND	--	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ST	ND	ND	ND	--	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	MC	ND	ND	ND	--	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.81	ND	0.447	ND	0.254	ND	0.14	ND	ND
5 to 6	EB	ND	ND	ND	0.533	4.17	ND	ND	ND	ND	1.03	ND	ND	ND	ND	ND	ND	ND	ND	3.58	ND	ND	1.13	ND	1.14	ND	1.76	0.39	ND	ND	ND
	AN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	ST	ND	ND	ND	ND	0.228	ND	ND	ND	ND	0.67	ND	ND	ND	ND	ND	ND	ND	ND	0.409	ND	ND	0.242	ND	0.331	ND	0.728	0.135	ND	ND	ND
	MC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.75	ND	0.874	ND	0.724	ND	ND	ND	ND
8 to 9	EB	--	--	--	--	13.1	--	--	--	--	0.108	--	--	--	--	--	--	--	--	1.48	--	--	6.86	--	2.0	--	5.79	--	--	--	--
	AN	--	--	--	--	4.83	--	--	--	--	ND	--	--	--	--	--	--	--	--	ND	--	--	ND	--	ND	--	ND	--	--	--	--
	ST	--	--	--	--	1.26	--	--	--	--	ND	--	--	--	--	--	--	--	--	0.182	--	--	1.91	--	0.542	--	0.393	--	--	--	--
	MC	--	--	--	--	ND	--	--	--	--	ND	--	--	--	--	--	--	--	--	ND	--	--	1.36	--	0.818	--	0.385	--	--	--	--
11 to 12	EB	--	--	--	--	0.089	--	--	--	--	--	--	--	--	--	--	--	--	--	0.251	--	--	10.0	--	2.72	--	4.38	--	--	--	--
	AN	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	6.78	--	--	11.9	--	ND	--	ND	--	--	--	--
	ST	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	1.93	--	1.38	--	3.18	--	--	--	--
	MC	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	ND	--	ND	--	ND	--	--	--	--

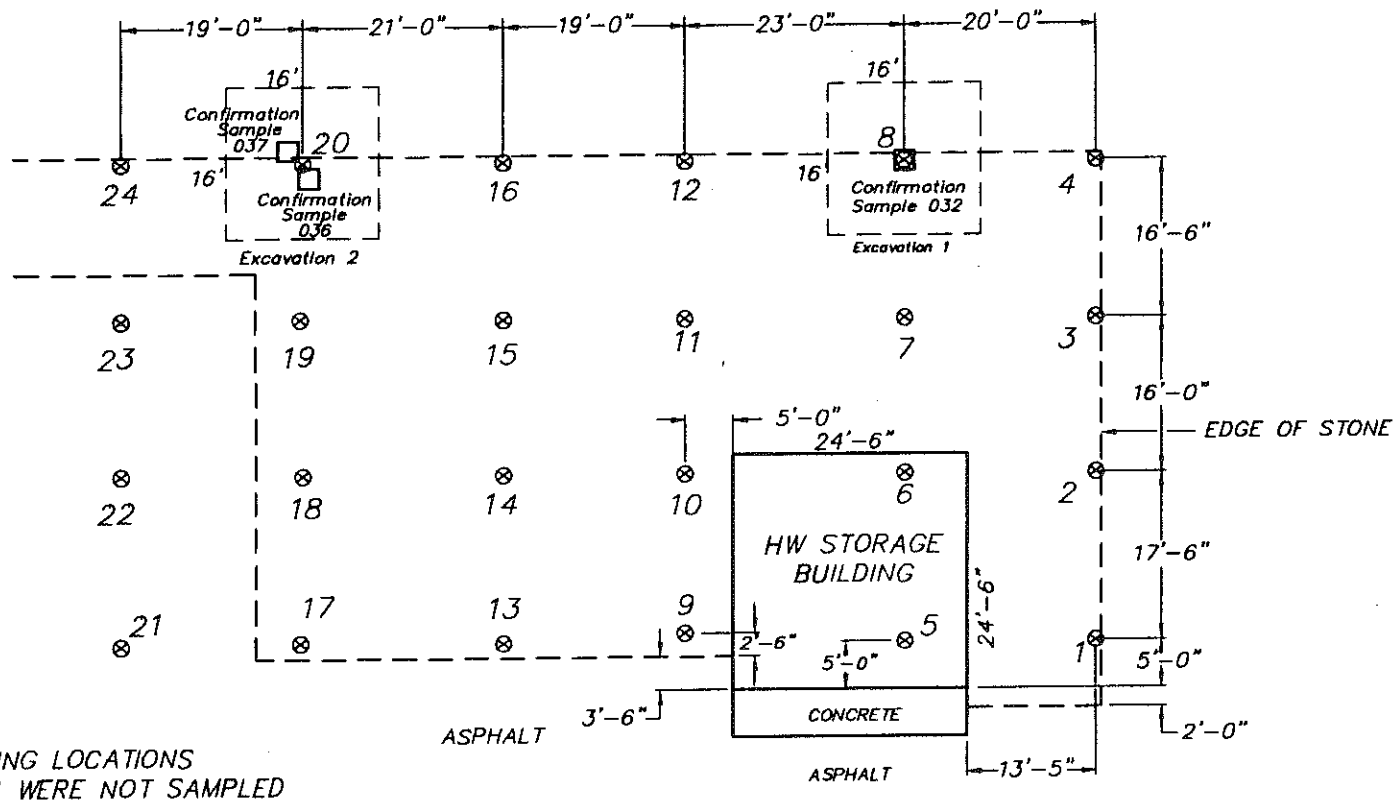
NOTES:

--- : Denotes no sample collected at this depth

ND : Denotes not detected

Soil-gas concentrations were measured by an on-site mobile laboratory equipped with a laboratory-grade G-C.
Phase III field sampling and analysis activities were performed in February 1993.

FILE: \7015\7015-006



LEGEND

⊗ PHASE I SOIL SAMPLING LOCATIONS (LOCATIONS 5 AND 6 WERE NOT SAMPLED BECAUSE OF CONCRETE FLOOR) SAMPLING DEPTH 0–1 ft

□ PHASE II CONFIRMATORY SAMPLING LOCATIONS SAMPLING DEPTH 1.5 ft. (SAMPLE 32 TAKEN AT SAME HORIZONTAL LOCATION AS PHASE I SAMPLE 8)

REFERENCE

BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

0 20 40
SCALE IN FEET

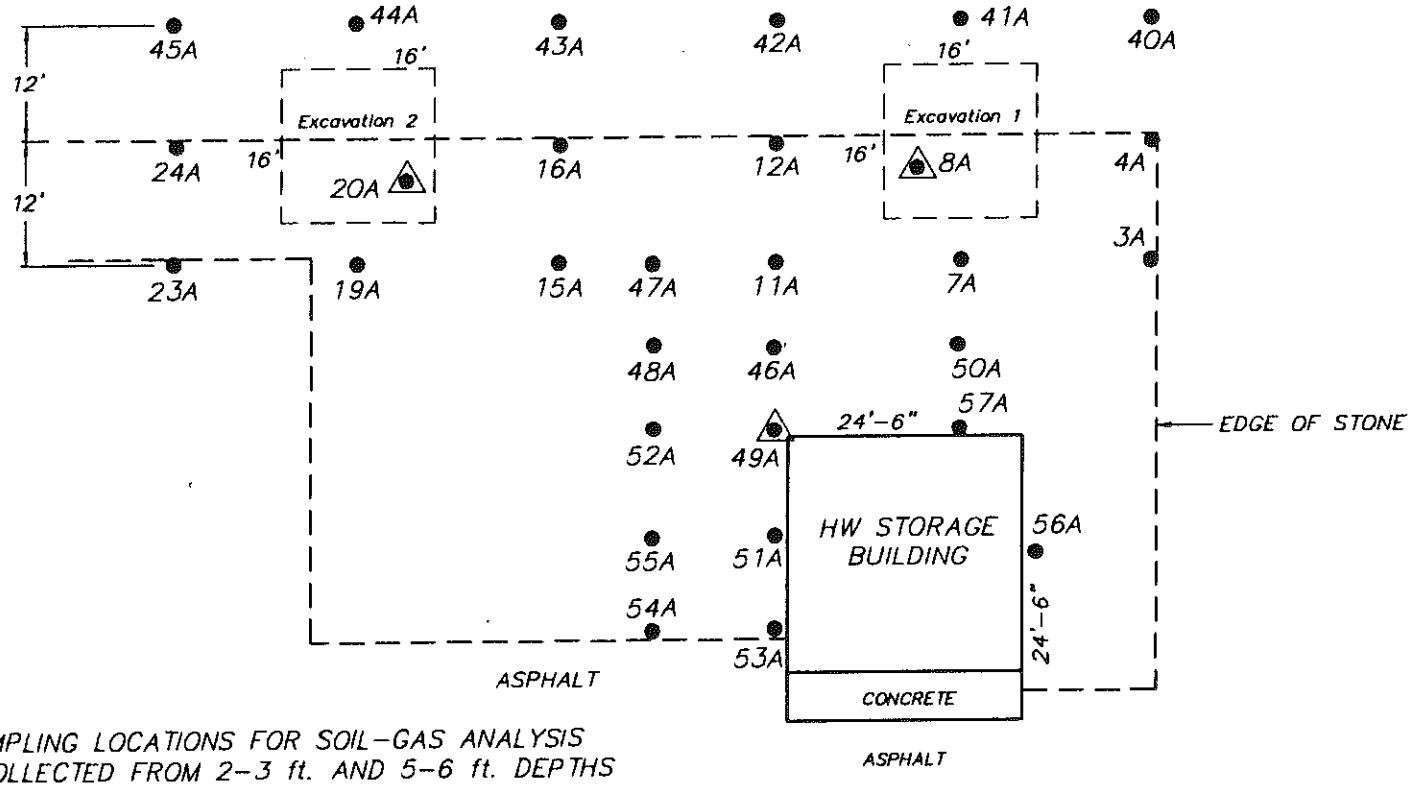
0 0
7 7
1 1
6 2
9 9
6 6
K K
G G

RADIAN INTERNATIONAL LLC

FORMER DRUM STORAGE AREA
PHASE I AND II SOIL SAMPLING LOCATIONS
HANGING ROCK PLANT IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-700	
SCALE: AS SHOWN	FIGURE NUMBER 3		REV 0

FILE: \7015\7015-007



LEGEND

- ● PHASE III SOIL SAMPLING LOCATIONS FOR SOIL-GAS ANALYSIS (SAMPLES WERE COLLECTED FROM 2-3 ft. AND 5-6 ft. DEPTHS AT ALL LOCATIONS, FROM 8-9 ft. DEPTHS AT SAMPLING LOCATIONS 2A AND 8A, AND FROM 8-9 AND 11-12 ft. FROM SAMPLING LOCATIONS 11A, 46A, 49A, 51A, AND 53A. A TOTAL OF 72 SAMPLES WERE SUBJECT TO SOIL GAS AND GC ANALYSIS)
- △● PHASE III SOIL SAMPLING LOCATIONS FOR OFF-SITE LABORATORY ANALYSIS (8A-1 (8-9ft. DEPTH), 20A-1 (8-9ft. DEPTH), 49A-2 (5-6 ft. DEPTH) AND 49A-3 (11-12 ft. DEPTH))

REFERENCE

BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

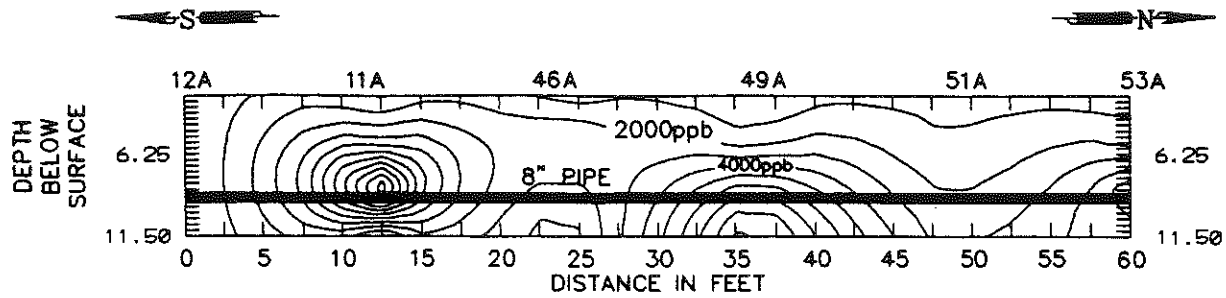
0 20 40
SCALE IN FEET

0 7 1 6 9 6 K G
0 7 1 2 9 6 K G

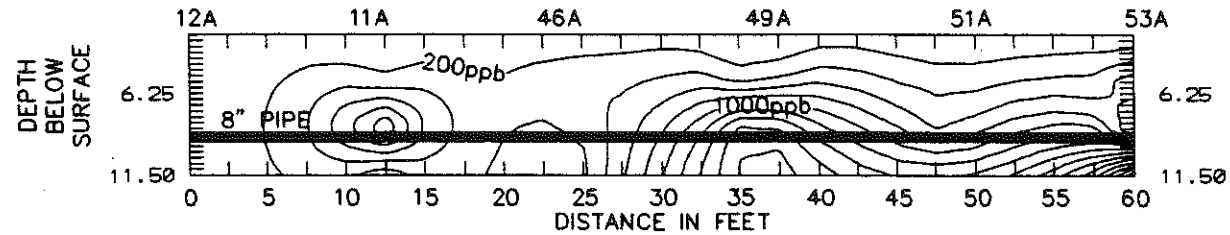
RADIAN INTERNATIONAL LLC

FORMER DRUM STORAGE AREA
PHASE III SOIL SAMPLING LOCATIONS
HANGING ROCK PLANT IRONTON, OH

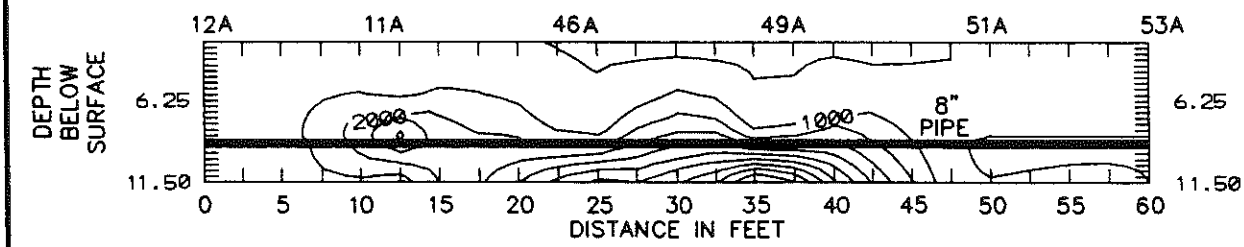
CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-700	
SCALE: AS SHOWN	FIGURE NUMBER 4		REV 0



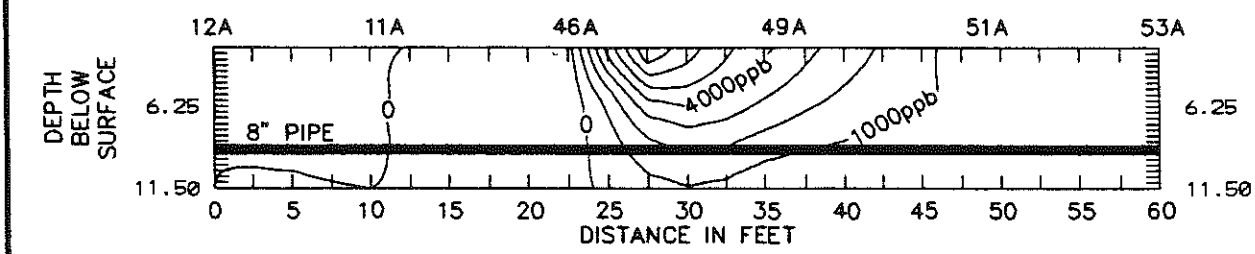
ETHYLBENZENE
CONTOUR INTERVAL 1000 ppb



STYRENE
CONTOUR INTERVAL 200 ppb



ACRYLONITRILE
CONTOUR INTERVAL 1000 ppb



METHYLENE CHLORIDE
CONTOUR INTERVAL 1000 ppb

FILE: \7015\7015-009

0077 1162 9968 KKGG

RADIAN INTERNATIONAL LLC

CONSTITUENTS CONCENTRATIONS IN PPB ALONG A CROSS SECTION PARALLEL TO THE PROCESS SEWER PIPELINE AT THE FORMER DRUM STORAGE AREA

HANGING ROCK PLANT — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-700	
SCALE: AS SHOWN	FIGURE NUMBER 5		REV 0

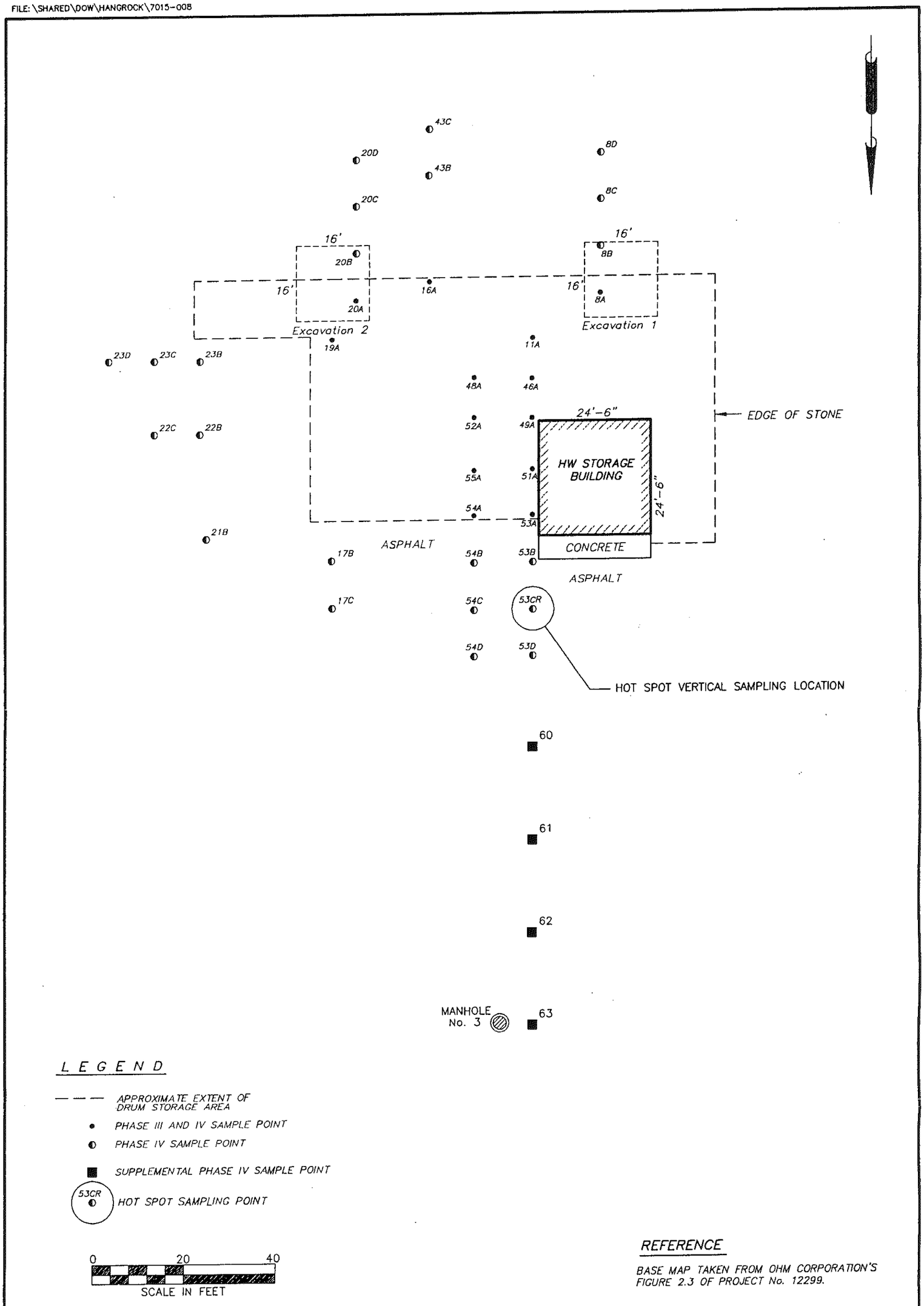
Comments on the Closure Plan Modification were received from OEPA, Division of Hazardous Waste Management (DHWM) in August 1994. Draft revisions to the Closure Plan Modification were submitted to the OEPA on August 29, 1994[6]. Following review of the draft revisions, the OEPA requested that the extent of the four previously-identified volatile organics in soil be adequately defined. This led to Phase IV closure activities that included additional soil sampling and a proposed management plan for the Former Drum Storage Area. The Phase IV activities were performed in October 1994. Appendix D includes the report that summarizes the Phase IV activities.

A total of 78 soil samples were collected during the Phase IV field activities, from 35 sampling locations shown in Figure 6. Sixty-seven samples were analyzed for AN, EB, MC, and ST using the U.S. EPA SW-846 Method 8240A. The remaining 11 were not analyzed because data from those sampled locations were not needed to identify three decreasing points of concentration. Results of the Phase IV soil analyses are shown in Table 4. Laboratory analysis results and data validation records are included in the March 1995 report in Appendix D. The data in Table 4 show that constituents concentrations were below 0.4 mg/kg, to a depth of 4 feet, with the exception of location 51A (Figure 6) that exhibited EB concentrations of 17 mg/kg and MC concentrations of 7.6 mg/kg.

The highest constituents concentrations were detected between 5 to 7 feet bgs, with the highest EB and ST concentrations occurring at locations 53B at a depth of 6 feet bgs which is the mid-point of the 2-foot sample interval (1,400 mg/kg of EB and 950 mg/kg of ST). Locations 53B, 53C, and 53D exhibited occurance of VOC constituents to a depth of 7 to 9 feet bgs, and location 53C to a depth of 9 to 11 feet bgs.

The data collected along the south-north transect between sample points 11A and 53B (which coincides with the subsurface process sewer line that transects the Former Drum Storage Area at approximatley 8 feet bgs), clearly indicate a distinct subsurface source of EB and ST concentrations at location 53B. As shown in Figures 7 and 8, concentrations decrease away from the maxima at a depth of 5 to 7 feet. In addition, a maximum subsurface concentration of EB and ST is indicated at location 11A at a depth of 4 to 6 feet bgs.

FILE: \SHARED\DOW\HANGROCK\7015-008



REFERENCE

BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

RADIAN INTERNATIONAL LLC

FORMER DRUM STORAGE AREA PHASE IV AND SUPPLEMENTAL PHASE IV SAMPLE LOCATIONS

HANGING ROCK PLANT — IRONTON, OH

CLIENT: THE DOW CHEMICAL COMPANY		JOB NUMBER: 7015-700	
SCALE: AS SHOWN	FIGURE NUMBER 6		REV 0

0077116299666KKGG

Table 4. Phase IV Concentrations of Constituents Above Detection Limits at the Former Drum Storage Area
Dow Hanging Rock Plant

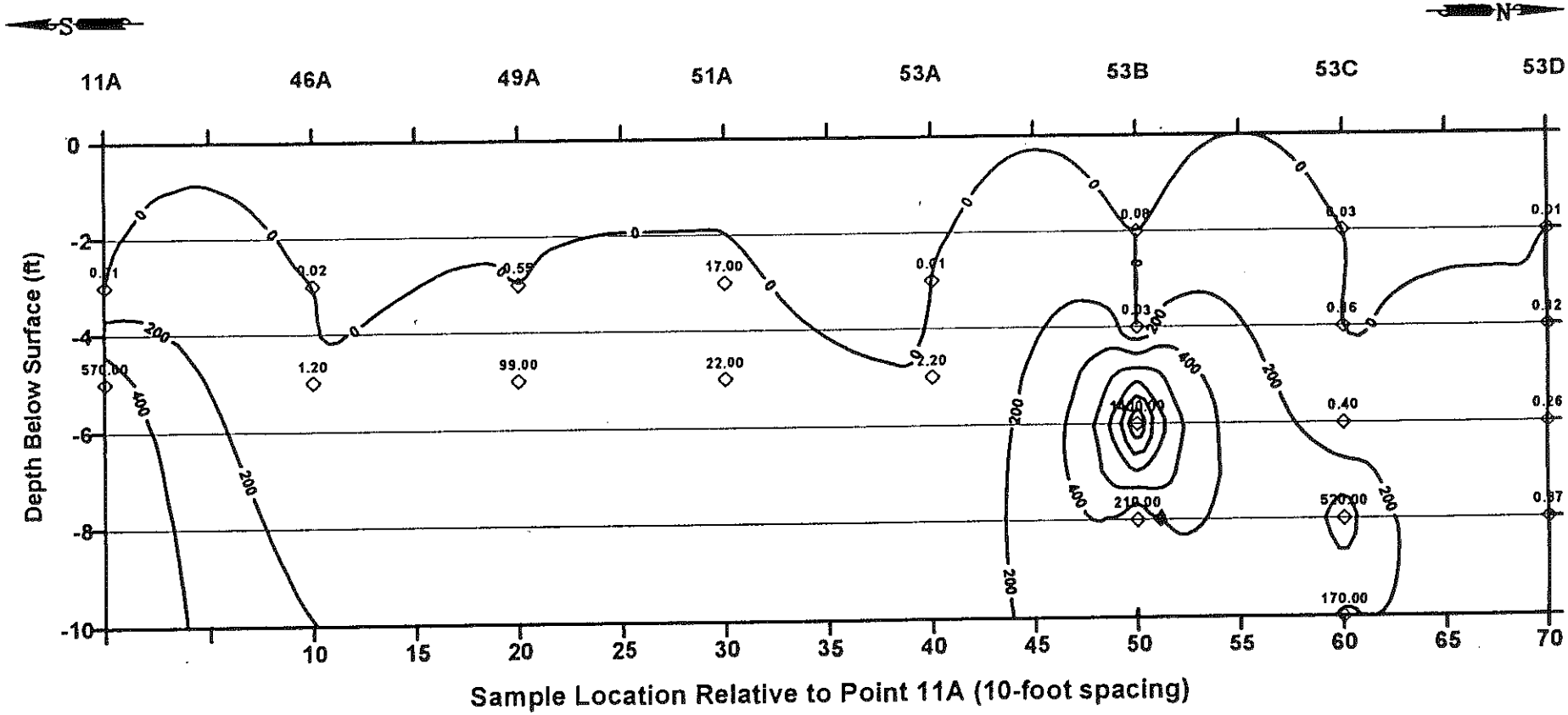
Depth(ft)[b]	Analyte[c]	Dry Weight concentration (ug/kg) at Sample Location[a]																																	
		3A	8B	8C	8D	11A	16A	17B	17C	19A	20A	20B	20C	20D	21B	22B	23B	23C	43B	43C	46A	48A	49A	51A	52A	53A	53B	53C	53D	54A	54B	54C	55A	BG-1	BG-2	BG-3
1	EB	--	<6	<6	<6	--	--	--	--	--	--	7	<6	<6	--	--	--	--	9	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	AN	--	<120	<110	<120	--	--	--	--	--	--	<120	<110	<110	--	--	--	--	<110	<110	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	ST	--	<6	<6	<6	--	--	--	--	--	--	<6	<6	<6	--	--	--	--	<6	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MC	--	<6	<6	<6	--	--	--	--	--	--	<6	7	<6	--	--	--	--	<6	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2	EB	--	--	--	--	--	--	<6	<6	--	--	--	--	--	<6	<6	<6	<6	--	--	--	--	--	--	--	--	76	30[d]	10	--	<6	<6	--	--	--	--
	AN	--	--	--	--	--	--	<120	<120	--	--	--	--	--	<120	<120	<120	<120	--	--	--	--	--	--	--	--	<120	<120	<120	--	<120	<120	--	--	--	--
	ST	--	--	--	--	--	--	<6	<6	--	--	--	--	--	<6	<6	<6	<6	--	--	--	--	--	--	--	--	88	74[d]	<6	--	<6	<6	--	--	--	--
	MC	--	--	--	--	--	--	<6	<6	--	--	--	--	--	<6	<6	<6	<6	--	--	--	--	--	--	--	--	<6	<6	<6	--	<6	<6	--	--	--	--
3	EB	--	200	<6	<6	8	<6	--	--	<6	--	<6	<6	<6	--	--	--	--	--	--	23	<6	550	17,000	<6	10	--	--	--	<6	--	--	<6	--	--	--
	AN	--	<120	<120	<120	<120	<120	--	--	<120	--	<120	<120	<120	--	--	--	--	--	--	<120	<120	<120	<16,000	<120	<120	--	--	--	<120	--	--	<120	--	--	--
	ST	--	<6	<6	<6	17	<6	--	--	<6	--	<6	<6	<6	--	--	--	--	--	--	14	<6	350	7,600	<6	<6	--	--	--	<6	--	--	<6	--	--	--
	MC	--	<6	<6	<6	<6	<6	--	--	<6	--	<6	<6	<6	--	--	--	--	--	--	<6	<6	<6	<760	<6	<6	--	--	--	<6	--	--	<6	--	--	--
4	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	33	160	120	--	<6	<6	--	--	--	--
	AN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<120	<120	<120	--	<120	<120	--	--	--	--
	ST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	38	280	63	--	<6	<6	--	--	--	--
	MC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<6	<6	<6	--	<6	<6	--	--	--	--
5	EB	<6	<6	<6	<6	570,000	--	--	--	--	90	28	<6	<6	--	--	--	--	--	--	1,200	--	99,000	22,000	--	2,200	--	--	--	<6	--	--	--	--	--	--
	AN	<120	<130	<130	<130	<540,000	--	--	--	--	<120	<120	<120	<120	--	--	--	--	--	--	<120	--	<55,000	<16,000	--	<620	--	--	--	<120	--	--	--	--	--	--
	ST	<6	1,500	<6	<6	530,000	--	--	--	--	57	47	<6	<6	--	--	--	--	--	--	320	--	60,000	12,000	--	3,400	--	--	--	<6	--	--	--	--	--	--
	MC	<6	<6	<6	<6	<27,000	--	--	--	--	<6	<6	<6	<6	--	--	--	--	--	--	<6	--	<2,700	<780	--	<31	--	--	--	<6	--	--	--	--	--	--
6	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,400,000	400	260	--	<6	<6	--	--	--	--
	AN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<670,000	<120	270	--	<120	<120	--	--	--	--
	ST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	950,000	540	300	--	<6	<6	--	--	--	--
	MC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<33,000	<6	18	--	9	<6	--	--	--	--
7	EB	--	--	--	--	--	--	--	--	--	--	27	<6	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	AN	--	--	--	--	--	--	--	--	--	--	<130	<120	<120	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	ST	--	--	--	--	--	--	--	--	--	--	53	<6	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MC	--	--	--	--	--	--	--	--	--	--	<6	<6	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	210,000	520,000	870	--	--	--	--	--	--	--
	AN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<160,000	<160,000	190	--	--	--	--	--	--	--
	ST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	81,000	200,000	490	--	--	--	--	--	--	--
	MC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<7,900	<7,900	40	--	--	--	--	--	--	--
10	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	170,000	--	--	--	--	--	--	--	--
	AN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<170,000	--	--	--	--	--	--	--	--
	ST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54,000	--	--	--	--	--	--	--	--
	MC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<8,100	--	--	--	--	--	--	--	--

(a) "<" indicates below detection limit, non-detected analytes are reported as the limit of quantitation, for example, the method detection limit for EB for sample 8B is 6 ug/kg; "--" indicates "not sampled".
(b) Midpoint of the 2-foot sample interval - depth below surface.
(c) "EB" - ethylbenzene; "AN" = acrylonitrile; "ST" = styrene; "MC" = methylene chloride.

Phase IV field sampling and analysis activities were performed in October 1994.
Laboratory analysis results and data validation records are included in the March 1995 Report in Appendix D.

FILE: \7015\7-SHELL

SOUTH - NORTH SOIL SAMPLING LOCATIONS TRANSECT



NOTE: THIS FIGURE REPRESENTS PHASE IV SAMPLING CONDUCTED FROM 10/20/94 TO 10/22/94. CONTOUR INTERVAL IS 200mg/kg.

0 0
7 7
1 1
6 2
9 9
6 6
K K
G G

RADIAN INTERNATIONAL LLC

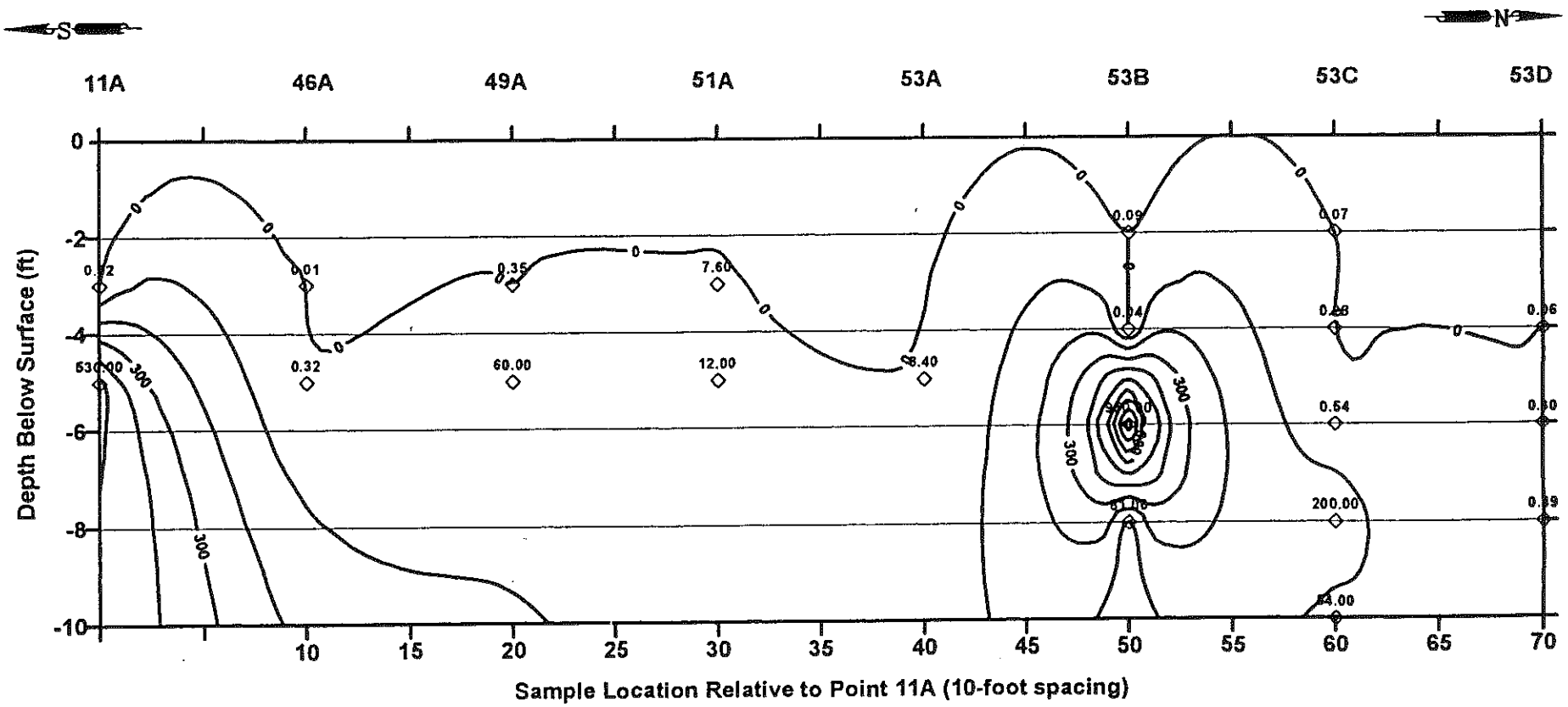
VERTICAL PROFILE OF ETHYLBENZENE CONCENTRATIONS IN SOIL (mg/kg) ALONG THE SOUTH-NORTH TRANSECT BETWEEN SAMPLE POINTS 11A AND 53B

HANGING ROCK PLANT — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-700	
SCALE: NONE	FIGURE NUMBER 7		REV 0

FILE: \7015\8-SHELL

SOUTH - NORTH SOIL SAMPLING LOCATIONS TRANSECT



NOTE: THIS FIGURE REPRESENTS PHASE IV SAMPLING CONDUCTED FROM 10/20/94 TO 10/22/94. CONTOUR INTERVAL IS 100mg/kg.

0716 9 6 K G

0711 2 9 6 K G

RADIAN INTERNATIONAL LLC

VERTICAL PROFILE OF STYRENE CONCENTRATIONS IN SOIL (mg/kg) ALONG THE SOUTH-NORTH TRANSECT BETWEEN SAMPLE POINTS 11A AND 53B

HANGING ROCK PLANT — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-700	
SCALE: NONE	FIGURE NUMBER 8		REV 0

Based on the Phase IV investigation findings, OEPA concluded in a letter sent to Dow in October 1995 (see Appendix B), that additional sampling was required to assess the horizontal and vertical extent of constituents in soil adjacent to the process sewer line to the north of the Former Drum Storage Area. This led to a supplemental Phase IV study that was conducted in January 1996. The study had the following objectives:

- Collection of additional soil samples to define the northern extent of constituents along the process sewer line. Constituents analyzed for were AN, EB, MC, and ST;
- Collection of soil samples at location 53C to determine the vertical extent of constituents. This included the need for collecting three consecutive samples that resulted in non-detect field screening including a confirmatory sample taken from the bottom of the boring for off-site laboratory analysis; and
- Interpretation of soil data to determine the extent of constituents concentrations and whether constituents in soil reached groundwater.

Details of this study are provided in the DEI, March 1996 Report (see Appendix D for details). Table 5 summarizes the soil vapor headspace analysis results, and Table 6 provides results of the five soil samples that were subjected to analysis using the U.S. EPA SW-846 Method 8240A. Laboratory analysis results and data validation records are included in the March 1996 report in Appendix D. Figure 6 shows the soil sampling locations and Figure 9 visually portrays the extent of constituents in soil.

The March 1996 Supplemental Phase IV Sampling Report included results of the hydrogeological investigation along a section of the process sewer line north of the Former Drum Storage Area and up to manhole Nº 3 (see Figure 6). Highlights of these results include:

- The process sewer line is buried within an unconsolidated clayey silt to silty clay formation which extends to a depth of about 11 to 12 feet bgs;
- A well-defined contact separates the upper clayey silt to silty clay layer from the underlying gravelly sand formation, which is characterized as medium dense, well-graded, light brown and moist; and

Table 5. Supplemental Phase IV Organic Vapor Headspace Concentrations for the Soil Boring Samples Along the Process Sewer Line as a Function of Depth Dow Hanging Rock

Depth (ft-bgs)	Organic Vapor Headspace Concentration (ppm) at the Indicated Soil Boring				
	SB-53CR	SB-60	SB-61	SB-62	SB-63
6-8	85	175	78	34	2559
8-10	226	494	102	36	439
10-12	1004	532	741	ND	48
12-14	7.3	290	ND	ND	7.3
14-16	ND	NM	9.7		7.3
16-18	34	NM			4.8
18-20	ND	78			4.8
20-22	ND	NM			
22-24	ND	7.3			

ND = non-detected

NM = not measured

Supplemental Phase IV field sampling and analysis activities were performed in January 1996.

Table 6. Supplemental Phase IV Soil Volatile Organic Compound (VOC) Concentrations for Samples Along the Process Sewer Line Dow Hanging Rock

	Volatile Organic Concentrations (µg/kg) at Indicated Soil Boring									
	SB-63		SB-62		SB-61		SB-60		SB-53CR	
Chloromethane	10	U	10	U	10	U	10	U	10	U
Bromomethane	10	U	10	U	10	U	10	U	10	U
Vinyl Chloride	10	U	10	U	10	U	10	U	10	U
Chloroethane	10	U	10	U	10	U	10	U	10	U
Methylene Chloride	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Acetone	23		15		10	U	10	U	22	
Carbon DiSulfide	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1-Dichloroethene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1-Dichloroethane	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2-Dichloroethene (total)	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Chloroform	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2-Dichloroethane	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Butanone	10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Carbon Tetrachloride	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Vinyl Acetate	10	U	10	U	10	U	10	U	10	U
Bromodichloromethane	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1,2,2-Tetrachloroethane	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2-Dichloropropane	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
trans-1,3-Dichloropropene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Trichloroethene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Dibromochloromethane	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1,2-Trichloroethane	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Benzene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U

RADIAN INTERNATIONAL LLC

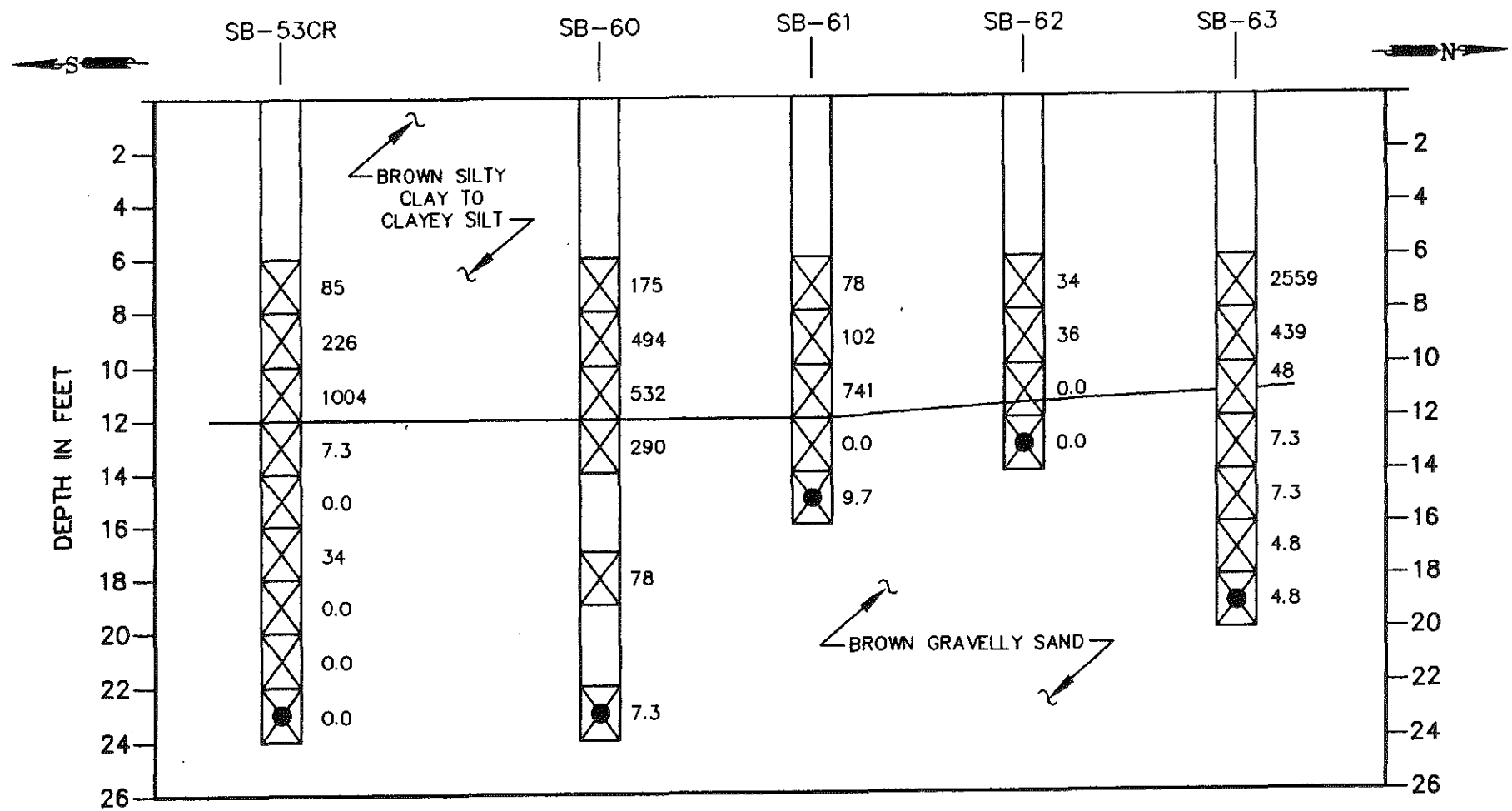
Table 6. Supplemental Phase IV Soil Volatile Organic Compound (VOC) Concentrations for Samples Along the Process Sewer Line (Continued) Dow Hanging Rock

	Volatile Organic Concentrations (µg/kg) at Indicated Soil Boring									
	SB-63		SB-62		SB-61		SB-60		SB-53CR	
cis-1,3-Trichloropropene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Chloroethyl Vinyl Ether	200	U	200	U	200	U	200	U	200	U
Bromoform	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Hexanone	10	U	10	U	10	U	10	U	10	U
4-Methyl-2-Pentanone	10	U	10	U	10	U	10	U	10	U
Tetrachloroethene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Toluene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Chlorobenzene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Ethylbenzene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Styrene	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Xylenes (total)	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Sampling Depth	Sampled from 18-20 ft.		Sampled from 13-14 ft.		Sampled from 14-16 ft.		Sampled from 22-24 ft.		Sampled from 22-24 ft.	

U = Nondetected, Number indicates detection limits

Supplemental Phase IV field sampling and analysis activities were performed in January 1996.
Laboratory anlaysis reuslts and data validation records are included in the March 1996 Report in Appendix D.

FILE: \7015\7015-010



LEGEND

7.3 SAMPLE INTERVAL AND HEADSPACE ORGANIC VAPOR RESULT (ppm)

LABORATORY ANALYTICAL SAMPLE RESULT OF NON-DETECT

SB SOIL BORING

0 15 30

SCALE IN FEET

0 7 1 6 9 6 K G

RADIAN INTERNATIONAL LLC

ORGANIC SOIL VAPOR & LABORATORY ANALYTICAL RESULTS FROM SOIL BORINGS ALONG THE PROCESS SEWER LINE NORTH OF THE FORMER DRUM STORAGE AREA

HANGING ROCK PLANT IRONTON, OH

CLIENT: THE DOW CHEMICAL COMPANY | JOB NUMBER: 7015-700

SCALE: AS SHOWN | FIGURE NUMBER 9 | REV 0

- No saturated subsurface conditions, nor groundwater were encountered during the field activities to a depth of 24 feet bgs along the 100-foot section that was investigated. All soil borings were completely within the unsaturated zone.

The Supplemental Phase IV Sampling Report also included results of the vertical extent of constituents concentrations in soil. Highlights of these results are:

- Organic vapor headspace concentrations decreased with depth below the process sewer line (approximately 8 feet bgs) and manhole Nº 3;

- The constituents concentrations in soil were confined primarily to the clayey silt to silty clay overlying the gravelly sand formation (i.e., to a depth of 11 to 12 feet bgs);

- Headspace soil samples collected for three consecutive sampling intervals (18-20, 20-22, and 22-24 feet) at the location which exhibited in previous investigations, the highest constituents concentrations in soil at a depth of 10 feet (SB-53C), resulted in non-detected organic vapors;

- Soil samples that were collected to confirm the non-detected organic vapors in the headspace samples from the bottom of each soil boring were analyzed using U.S. EPA SW-846 Method 8240. Results of the analysis were below the method detection limit for each of the soil samples and for each of the VOCs analyzed for, including AN, EB, MC and ST. The laboratory analysis results confirmed the headspace results; and

- The results of the hydrogeological investigation and the vertical extent of constituents concentrations in soil clearly show that organic constituents in soil are primarily confined to the process sewer line area and are primarily detected in the clayey silt to silty clay layer (i.e. 11 to 12 feet bgs). This, together with the fact that no groundwater was encountered in any of the five soil borings down to a depth of 24 feet bgs, and no constituents concentrations were detected at this depth, eliminates the concern about constituents migration to groundwater and the need to consider this matter in any proposed closure action.

Based on these results Dow proposed in April 1996 to OEPA, a closure for the Former Drum Storage Area which included the following actions:

- Excavate and dispose of soil from the area of the process sewer line underlying the Former Drum Storage Area, in accordance with RCRA requirements. The excavation will involve a length of approximately 50 feet, a width of approximately 4 feet, and a depth of 12 feet. This will result in removing approximately 90 cubic yards of soil along and below the sewer line, from locations that consistently exhibited the highest constituents concentrations in previous investigations;

- Perform additional soil excavation to provide the space for the proposed collection sump. The estimated volume to be excavated and disposed of in accordance with RCRA requirements, is approximately 450 cubic yards. (The original estimated volume of soil associated with the construction of the sump was revised from approximately 150 to 450 cy including selective excavation); and

- Perform risk-based closure of the Former Drum Storage Area and the process sewer line underlying it. The health risk assessment will address only constituents concentrations in soil and will exclude the groundwater exposure pathways because of reasons discussed under the summary of hydrogeological conditions and the vertical extent of constituents concentrations in soil which showed no presence of groundwater and no migration of constituents to the depth of soil investigated. Results of the risk assessment will define the soil clean-up levels. Any additional excavation and disposal will be done according to these clean-up levels.

In addition, Dow proposed a closure for the section of the process sewer line extending to the north of the Former Drum Storage Area to manhole Nº 3. The proposed closure for this part of the process sewer line included the following actions:

- Excavate and dispose of soil from the area of the process sewer line extending to the north of the Former Drum Storage Area to manhole Nº 3 (see Figure 6) in accordance with RCRA requirements. This excavation will involve a length of approximately 100 feet, a width of approximately 4 feet, and a depth of up to 12 feet. This will result in removing approximately 180 cubic yards of soil along and below the sewer line, from locations that exhibited high constituents concentrations in previous investigations; and

- Perform a risk-based closure of this portion of the process sewer line area. The health risk assessment will address only constituents concentrations in soil and will exclude the groundwater exposure pathways because of the same reasons discussed under the proposed closure for the Former Drum Storage Area. Results of the risk assessment

will define the soil clean-up levels. Any additional soil excavation and disposal will be done according to these clean-up levels.

To implement these tasks, Dow proposed to revise the draft Closure Plan to reflect the above-proposed actions. In May 1996, OEPA responded to the Dow proposed closure activities (see Appendix B). In their letter the OEPA concurred with the April 1996 Dow-proposed approach and agreed that the groundwater pathway need not be considered in the risk assessment for soils in the Former Drum Storage Area. The OEPA May 1996 letter led to the preparation of this Closure Plan which addresses the clousre of the Former Drum Storage Area. The voluntary closure of the process sewer line is addressed in a separate closure plan document.

2.5 Sources and Extent of Constituents

As discussed in Sections 2.2 and 2.3, the short duration storage activities that took place in the Former Drum Storage Area coupled with the use of the process sewer line, a portion of which underlays the storage area, resulted in the presence of AN, EB, MC, and ST in several locations in the soil. Data from past investigations indicated that MC is associated with a surface source (i.e. drum storage activities) and the other three chemicals displayed concentrations at a depth and location indicating a subsurface source (i.e. the process sewer line).

No sources of constituents concentration exist in the Former Drum Storage Area at the present time since operations have ceased in 1980. The use of the process sewer line from manhole № 3 ceased in late 1993. However, closure of the Former Drum Storage Area without addressing the process sewer line may leave in place high VOC constituents concentrations in certain subsurface locations. Recognizing this fact, although the Former Drum Storage Area and the process sewer line represent two separate SWMUs, Dow decided to take a voluntary action of closing a portion of the process sewer line in conjunction with the closure of the Former Drum Storage Area.

The constituents of concern in this closure are AN, EB, MC and ST. The extent of constituents in the shallow soil is limited primarily to the process sewer line area (see Section 2.3.2, Table 6 and Figure 6)) at a depth between 5 to 11 feet bgs. Since portions of the process sewer line are scheduled for removal, excavation will take place from the surface to a

depth of 12 feet and a width of 4 feet. Thus, the estimated excavation in the Former Drum Storage Area is: 50 ft long x 4 ft wide up to 12 ft deep, or 90 cubic yards (cy) of excavated soil.

Additional selected excavation may be done in the Former Drum Storage Area because of the following:

- Visual observation of stained soil;
- Exceedance of the clean-up criteria;
- Discretionary excavation pursuant to good engineering practice; and
- Meeting the needs of installing the collection sump.

For this Closure Plan, it is estimated that additional excavation will involve: 45 ft long x 20 ft wide area up to 12 ft deep, or 400 cy of excavated soil as a part of the collection sump construction and additional 50 cy based on the first three criteria above.

3.0 Statement of Work

3.1 Objectives of the Closure

3.1.1 Objectives for Environmental Media, Constituents and Exposure Pathways

The overall objective of the closure activities is to attain a risk-based closure that meets the clean-up criteria that are based on the Ohio EPA Closure Plan Review Guidance for RCRA Facilities Interim Final, September 1, 1993.

The affected media is:

- Soil with constituents concentrations in the Former Drum Storage Area especially along the process sewer line.

No groundwaters are affected or will be affected as discussed in Section 2.3.2 since no groundwater was encountered to a depth of 24 ft bgs and no constituents concentrations were detected at this depth.

Constituents of concern are:

- Methylene chloride (MC);
- Ethylbenzene (EB);
- Acrylonitrile (AN); and
- Styrene (ST).

Potential exposure pathways:

- Groundwater – none as explained above and in Section 2.3.2; and
- Soil – none, if soil is not disturbed because of the low concentrations of constituents in soil is present in the first few feet bgs, and the inability of humans to ingest or inhale soils containing higher levels of constituents that occur at a depth of 7 to 11 feet bgs.

However, for the purpose of this closure, the ingestion and inhalation exposure pathways are assumed for on-site workers, and the ingestion pathway is assumed for residents. Following the U.S. EPA risk assessment methodology, the inhalation pathway is not con sidered for the residents.

3.1.2 Proposed Clean-up Criteria for the Constituents of Concern

Table 7 includes risk-based industrial and residential soil clean-up levels for the Former Drum Storage Area. The table includes clean-up levels that were derived based on the Ohio EPA Closure Plan Review Guidance for RCRA Facilities. Appendix E includes details of the methodology and assumptions used to develop these clean-up levels. The proposed Former Drum Storage Area closure activities will be performed pursuant to the industrial clean-up levels listed in Table 7. It is understood that industrial land use closure will result in a deed restrictions and survey for this area. However, if results of the confirmatory soil sampling and analysis will reveal that the residential clean-up levels were achieved, the area closure will be certified pursuant to the residential land use closure.

The intent of the closure is to excavate soil along the process sewer line to concentrations that will meet, at a minimum, the industrial clean-up levels in Table 7. This will be demonstrated by the post-excavation confirmatory soil sampling and analysis. Additional selective excavation will be done following the criteria outlined in Section 2.4.

Table 7. Risk-Based Residential Soil Clean-up Levels for the Former Drum Storage Area Dow Hanging Rock Plant

Constituent	Industrial Land Use Clean-up Level (mg/kg)*	Residential Land Use Clean-up Level (mg/kg)**
Acrylonitrile	2	0.6
Ethylbenzene	1,600	700
Methylene Chloride	50	20
Styrene	3,500	450

3.1.3 Areas Subject to the Closure Activities and Estimated Volumes

Figure 10 outlines the areas to be excavated. This includes:

- Former Drum Storage Area:
  - Area along the process sewer line: 90 cubic yards (cy), from a 50 ft x 4 ft area to a depth of up to 12 feet.
  - Area of portion of the the collection sump: 400 cy, from an estimated 45 ft x 20 ft area to a depth of up to 12 feet.
  - Areas of selective excavation: 50 cy based on visual observations of stained soil, exceedance of the soil clean-up criteria and discretionary excavation pursuant to good engineering practices.

The estimated total volume of soil to be excavated is 540 cy. Accounting for a fluff factor of 1.3, the quantity of soil to be disposed of is approximately 700 cy.

3.2 Quality Assurance

This section describes the quality assurance goals for the implementation of the closure activities. The closure activities will be performed in accordance with the procedures outlined in the Work Plan. Specific, quality assurance objectives are:

- Maintain quality control through standardized procedures, documentation, inspections, and reporting;

- Complete the closure activities and associated activities pursuant to the highest level of workmanship and redo or repair off-specifications or incomplete project tasks; and

- Assure that project equipment and materials meet the specifications as intended by the Work Plan; moreover, reject and replace sub-standard equipment or materials.

Sample handling and field activity documentation procedures for QA/QC are described in Section 4.4.1 of this Work Plan.

3.3 Independent Certification

Certification that the Former Drum Storage Area has been closed in accordance with the specifications of this plan will be provided to the OEPA within 31 days of completing the

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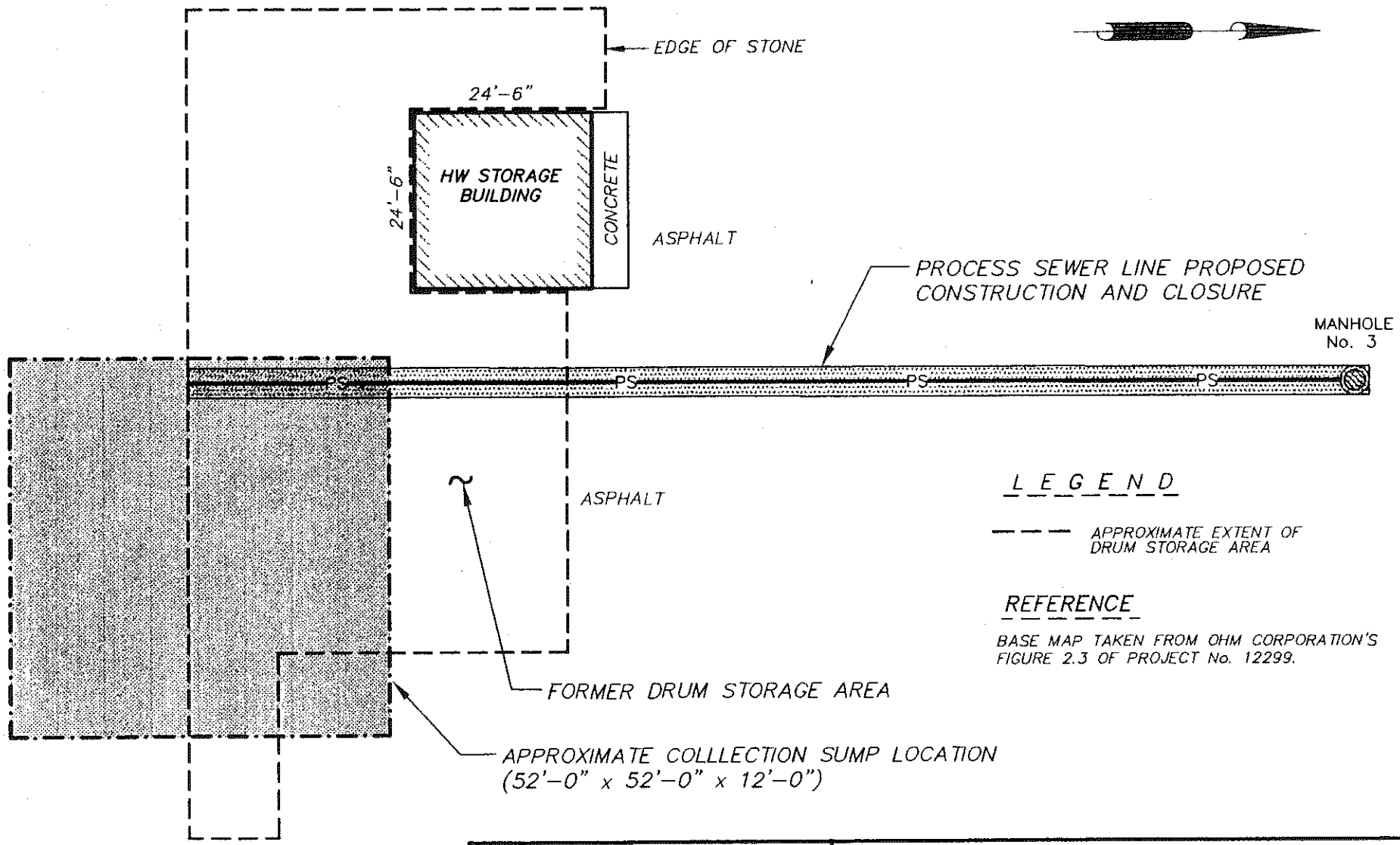

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RADIAN INTERNATIONAL LLC

COLLECTION SUMP CONSTRUCTION AND CLOSURE OF THE FORMER DRUM STORAGE AREA & THE PROCESS SEWER LINE

HANGING ROCK PLANT — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-700	
SCALE: AS SHOWN	FIGURE NUMBER 10		REV 0

closure. A statement identical to that found in OAC 3745-50-42(D) will be signed by both the owner/operator and a qualified, independent registered professional engineer licensed in Ohio. As a minimum, the certification report will include the following statement from OAC 3745-50-461(D):

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed toassure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly reponsible for gathering the information, the infromation submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine imprisonment for knowing violations."

4.0 Closure Plan

This section provides a discussion of the closure activities for the Former Drum Storage Area.

4.1 Proposed Closure Activities

The areas subject to closure activities for the Hanging Rock property were outlined in Section 3.1.3. This includes:

- Excavation of soil near and below the sewer line inlcuding removal of the line in the Former Drum Storage Area: 90 cubic yards (cy), from a 50 ft x 4 ft area to up to 12 feet in depth;
- Excavation of soil for the installation of a collection sump: 400 cubic yards (cy) from an estimated 45 ft x 20 ft area to approximately 12 feet in depth; and
- Selective excavation: 50 cy in several locations in the Former Drum Storage Area.

4.2 Effectiveness of the Closure Activities

As discussed in Sections 3.1.1 through 3.1.3, the proposed closure activities are:

- Provide compliance with the OEPA order for formal closure;
- Meet the risk-based residential soil clean-up criteria that are designed to protect public health and the environment; and
- Mitigate high constituents concentrations in soil permanently by the excavation of soil.

The closure activities are considered technically and economically effective for the Former Drum Storage Area.

4.3 Project Description

This section describes the field activities associated with closure of the Former Drum Storage Area. The closure activities include soil and sewer line excavation, followed by the construction of a 40,000-gallon collection sump to manage the hydraulic loads from the process and unloading areas prior to transfer for treatment at the wastewater treatment plant. As part of this project, Dow plans to perform a voluntary closure of the process sewer line by removing and replacing the line underlaying the Former Drum Storage Area and extending to manhole Nº 3. This activity will involve approximately 150 feet of the line. This closure plan covers only the portions of the sewer line underlaying the Former Drum Storage Area. Closure of the section, north of the Former Drum Storage Area and up to manhole Nº 3 (100 ft. long), is addressed in the closure plan for the process sewer line.

The optimal location for the collection sump, considering existing infrastructure and design engineering factors, is the southeast corner of the Former Drum Storage Area and the area adjacent to it (see Figure 10). This means that only part of the sump will be located on the Former Drum Storage Area.

Sub-sections of the project description section include the following:

- Site mobilization;
- Work zones;
- Closure methods; and,
- Permit requirements/disposal approval.

4.3.1 Site Mobilization

Mobilization will occur after the work plan has been approved by The Ohio EPA, and transportation and disposal services have been scheduled. At that time, construction work zone areas and exclusion areas will be established for worker safety and to limit unauthorized

personnel from entering the exclusion areas. Equipment to be delivered to the site prior to the initiation of closure activities include:

- Track-mounted CAT 215 LC backhoe or equivalent;
- Roll-offs;
- Pressure washer (1);
- Fifty-five gallon drums for miscellaneous waste disposal;
- Truck liners;
- Soil sampling equipment;
- Personal protective equipment;
- Photoionization Detector (PID);
- Combustible Gas Indicator (CGI); and
- Miscellaneous supplies and expendables.

Additional items to be addressed before the initiation of closure activities include underground utilities, personnel training and medical surveillance.

Drawings showing plant utilities will be reviewed and verified by the plant engineer before closure activities begin. If necessary, utility clearance will be arranged prior to the performance of any work utilizing a local utility locator service.

4.3.2 Work Zones

Areas to be excavated will be marked with high visibility caution tape and be fenced, and support zones will be established to delineate the various areas associated with the closure activities. The specific zones to be established are discussed below.

Exclusion Zone (EZ)—The key exclusion zone (EZ) will be the portion of the Former Drum Storage Area that includes the 50 feet of the process sewer line shown in Figure 10. This area will be well marked with high visibility safety fencing and will only be entered by authorized individuals outfitted with the appropriate personal protective equipment. Additional exclusion zones will include the southeast corner of the Former Drum Storage Area where a portion of the collection sump will be installed and a few small areas where selective excavation will be performed. They also will be marked with high visibility safety fencing.

Constituent Reduction Zone (CRZ)—The constituent reduction zone (CRZ) will be the area immediately adjacent to the EZ and will be used as the area for protective clothing removal and personnel decontamination as workers exit the EZ. The backhoe will be located within the CRZ. This area will be entered only by authorized personnel involved in remediation activities.

Support Zone (SZ)—The support zone (SZ) will be the area beyond the Former Drum Storage Area CRZ where support personnel and equipment will be staged. Access to the site will be restricted by the main entrance gate. Covered trucks used to transport soil will be staged in the support zone adjacent to the CRZ.

4.3.3 Closure Methods

This section provides a general description of the procedures to be used to excavate soils and the sewer line. In addition, this section outlines the collection sump and connection piping to be installed before area restoration.

Soil Excavation Methods—Soil excavation will be performed by removing the soil with a backhoe from the subject area. Excavation will continue along 50 feet of the sewer line in an approximate width of 4 feet, and a depth of up to 12 feet as shown on Figure 10. This soil and sewer line excavation will result in approximately 90 cubic yards of soil removed from along and below the process sewer line. Each section of sewer line will be visually inspected before removal to prevent the spillage of free liquids. Free liquids will be pumped and collected in drums for proper treatment in the on-site wastewater treatment plant.

Excavation will continue in the Former Drum Storage Area to facilitate the installation of the collection sump and connection piping. Selective soil excavation will be performed as explained in Section 3.1.3. Soil samples will be collected from the bottom and walls of the excavated areas to confirm that the clean-up levels in Table 7 have been met (see Section 4.4 and Table 8). These samples will be collected after soil field screening has been performed and indicate low VOCs levels. Connection piping will be installed in the former process sewer line trench and will extend to the north to manhole Nº 3. Backfilling and restoration of areas will be performed at the completion of soil excavation and construction of the collection sump, in accordance with procedures outlined in **Backfilling and Restoration**.

Excavation will proceed cautiously so as not to produce unnecessary overburden or disturb the adjacent hazardous waste storage structure or possible underground utilities. The quantity of soil excavated on a daily basis will be determined based on the location of the excavated area, the depth of excavation, the frequency of field screening and confirmatory sampling, and the proximity of the area to underground utilities, subsurface structures and building foundations.

Soil Handling—The soil excavated from the Former Drum Storage Area (540 cy of excavated soil, 700 cy of soil to be disposed off-site [using 1.3 fluff factor]) will be placed in roll-offs and/or onto visqueen and staged in piles adjacent to the excavation in the EZ. Roll-offs and storage piles will be covered and marked with high visibility caution tape until the soils can be loaded into covered trucks and hauled to the disposal facility. Excavated soil from the Former Drum Storage Area will be managed as hazardous waste until characterization sampling is completed.

Upon receipt of soil characterization and disposal facility approval, licensed haulers will be contracted to transport the material in covered trucks for disposal in accordance with applicable Ohio and Federal regulations.

Soil excavated from portions of the plant site that are not part of the Former Drum Storage Area (estimated additional 800 cy of excavated soil), will be placed onto visqueen separately from the soil excavated from the Former Drum Storage Area. This soil, after testing

for the presence of constituents, will be used as a clean fill material during the restoration activities.

Decontamination—Any components of the equipment which are suspected to have come in contact with contaminated soil will be decontaminated prior to leaving the EZ. This will be accomplished by constructing a portable decontamination pad consisting of polyethylene sheeting and lumber. Initially, all gross contamination will be physically removed by brushing prior to introducing any liquids. A high pressure, low volume water blaster will then be used to thoroughly decontaminate surfaces. The low volume blaster will minimize the decontamination efforts and water requirements associated with these efforts and will keep wastewaters to a minimum.

Water generated by decontamination will be collected and drummed for analysis as discussed in Section 4.6. Based on the results of analyses, these waters will be treated at the on-site wastewater treatment plant.

Personnel decontamination will consist of doffing protective clothing as outlined in the Health and Safety Plan and placing it into bags for future disposal with the excavated soils. After all protective clothing has been removed, employees will stet into the CRZ and complete decontamination by washing hands and face with mild detergent and water. The liquids generated from this activity will also be disposed of in the same manner used for equipment decontamination.

Backfilling and Restoration—Backfilling operations will occur following the completion of the construction of the collection sump and receipt of confirmatory soil samples results.

The construction of the collection sump will be part of the restoration. The construction activities will include:

- Construction of a double-contained 52 ft x 52 ft x 12 ft deep collection sump with a capacity of a minimum 40,000 gallons storage. The sump will have leak detection

risers, separation system, vacuum truck sump, pump sump, hand rail, perimeter fence, ladder access, and grating over the separator system area;

- Construction of underground single-walled Drisco pipeline from manhole Nº 3 to the sump;
- Installation of a sump pump to transfer process sewer from the sump to the wastewater treatment plant;
- Installation of above ground line from the sump to the wastewater treatment; and
- Installation of high and high-high level indicators, emergency overflow to plant ditches, and other support equipment.

Once the above-referenced system is installed, backfilling and restoration will be performed.

To perform backfilling operations economically while ensuring that adequate compaction is attained, excavated areas will be backfilled to the extent possible, with soil excavated from portions of the plant site that are not part of the Former Drum Storage Area. Soil will be spread in 8-inch lifts and compacted with the use of either a hydraulic compactor mounted to the backhoe or a hand-operated vibratory compactor, depending on the total area and depth of excavation. Backfill completion will be compatible with the present use of each area, i.e. grass cover, gravel and asphalt. As an example, area where a three-inch layer of asphalt exists with a six-inch subgrade, will be replaced with the same material. The paved area will be mechanically compacted prior to resurfacing.

4.3.4 Permit Requirements/Disposal Approval

This section describes the project's permit requirements and disposal restrictions that may apply to the excavated soil generated by this closure action.

Permits to Install—A permit to install application for the collection sump will be prepared and submitted to OEPA. The PTI will address the process sewer treatment in the

wastewater treatment plant, and the plant NPDES permit. Construction of the collection sump will start after approval has been received from OEPA.

Soil Disposal Restrictions—Methylene chloride (F002) is a listed hazardous waste. Ethylbenzene and styrene are flammable liquids that may cause waste, in this case soil, to exhibit the characteristic of ignitability (D001). Acrylonitrile (U009 off-specification commercial chemical product) was also stored at the Former Drum Storage Area. Federal and State land disposal restrictions (LDR) are applicable to these three hazardous wastes as follows:

- F002 (spent solvent wastes) must meet the following LDR:
  - MC leachate concentrations of 0.96 mg/l
  - MC soil concentration of 30 mg/kg
  - EB soil concentration of 10 mg/kg
- D001 (ignitable waste) must meet the following LDR:
  - Be deactived as a non-wastewater low total organic content (TOC) waste that exhibits the charactericis of ignitability
  - AN soil concentrations of 84 mg/kg
  - EB soil concentrations of 10 mg/kg
  - MC soil concentrations of 30 mg/kg
- U009 (off-specification commercial product) must meet the following LDR:
  - AN soil concentrations of 84 mg/kg.

Note that because styrne is not a listed hazardous waste, chemical specific concentration limits do not apply.

The excavated soil will be sampled and analyzed for waste characterization to ensure compliance with the above LDR. If the soil concentrations and leachate concentrations are not met, the soil will be treated prior to disposal in an approved landfill.

Disposal Destination—Soil transported offsite for disposal will be documented on Form 2, Waste Shipment Log, found in Appendix F. Soils will be transported to an appropriately permitted facility, depending upon the specific characteristics of the waste.

Waste characterization sampling will be required in order to gain disposal facility approval. Samples will be collected during the field activities to characterize the soil prior to its disposal off-site.

4.4 Confirmatory Sampling and Analysis

This section provides a summary of the confirmatory sampling and analysis which is designed to confirm that clean-up levels had been achieved. Table 8 provides information on the number of soil samples, including QA/QC samples, analytical methods, constituents to be analyzed, and turnaround time. A total of 23 confirmatory soil samples, and six QA/QC samples will be collected during the soil excavation activities.

Table 8. Confirmatory Sampling and Analysis of Soil
Former Drum Storage Area
Hanging Rock Plant

Sampling Location	Sampling Grid Size	No. of Soil Samples	No. of QA/QC Samples*	Analysis Method	Turnaround Time
Excavation of the process sewer line area (~ 90 cy of excavated soil)	20 ft.	8	1	8240 for VOCs including AN, EB, MC and ST	24 hours
Excavation for portions of the collection sump (~ 400 cy of excavated soil)	20 ft	10	1	8240 for VOCs including AN, EB, MC and ST	24 hours
Selective excavation areas (~ 50 cy of excavated soil)	10-20 ft depending on size of excavated area	5	1	8240 for VOCs including AN, EB, MC and ST	24 hours

* Three trip blank samples also will be sent for laboratory analysis.

The number of soil samples is based on a sampling grid interval for the floor and the walls of approximately 20 ft or less, depending on the size of the area to be excavated. Confirmatory analysis will include:

- Field headspace analyses of soil to qualitatively assess the soil clean-up level, followed by;
- Off-site laboratory confirmatory analysis of soil to determine whether the clean-up levels were reached.

Headspace grab soil samples will be collected with a clean trowel from the backhoe bucket upon extraction from the excavation, when it will be judged that excavation is near completed in the area.

The soil will be placed into a clean 8-ounce (oz) sample jar. Volatilization of constituents from the sampled soil will be minimized by sampling as quickly as possible and by selecting those portions of soil least-disturbed by the backhoe bucket. The sample will be contained as soon as possible and the jar will be sealed immediately after sample deposition. The sample jar will be filled to about one-half of capacity and sealed with aluminum foil and rubber bands. The sample jar will be placed in a warm water bath for about 10 minutes to allow the soil and air inside the jar to reach equilibrium before analysis. After 10 minutes, a field gas chromatograph (Photo ionization Detector [PID]) will be used to analyze the air for methylene chloride. The instrument probe will be carefully inserted through a small opening in the aluminum foil and the result will be recorded on Headspace Analysis Sample Log (see Form 3 in Appendix F). Operation and calibration of the instrument shall be conducted in accordance with manufacturer's specifications. In addition to standard calibration methods, field blanks (one per day) and duplicates (5 percent of total samples) will be analyzed as part of the quality assurance and quality control program.

The trowel and associated sampling equipment will be decontaminated after the collection of each soil sample.

Confirmatory soil samples will be collected from the floor and walls of the excavation area according to the grid spacing in Table 8. Sampling procedures will be the same as those for headsapce analysis. Soil samples will be placed into clean 8-ounce (oz) jars. The jars will be completely filled. Sample quality assurance (QA)/quality control (QC) is provided in Section 4.7.

Confirmatory soil analyses are designed to document that the soil clean-up levels reached those outlined in Table 7. The confirmatory soil analysis will utilize the U.S. EPA SW-846 Method 8240 with Level IV documentation and QA/QC. Turnaround time will be 24 hours to minimize delays of the closure activities.

4.5 Waste Characterization Sampling and Analysis

Samples will be collected from the excavated soil placed in roll-offs and/or visqueen to characterize the soil prior to off-site disposal. The samples will be placed in 8- or 16-ounce sample jars. The jars will be closed and well-taped prior to shipment. Sampling procedures will be similar to those employed for the confirmatory soil sampling. Samples QA/QC is provided in Section 4.7. The number of soil characterization samples will be determined in accordance with the requirements of the disposal facility.

Laboratory analysis will be performed in accordance with the disposal facility requirements and may include toxicity characteristics leaching procedure (TCLP) leachate extract. Soil samples will be analyzed using U.S. EPA SW-846 Methods 8240 (VOCs), 8270 (semivolatiles organic compounds [SVOCs]), and the 6010/7000 series (metals). In addition, the standard test methods for ignitability, corrosivity, reactivity, and toxicity will be performed in accordance with 40 CFR 261.

4.6 Free Liquids Procedure

In addition to the laboratory analyses described above, samples collected from the Former Drum Storage Area excavated soil will be subjected to the paint filter liquids test (SW-846 Method 9095) to determine the presence of free liquids. Liquids produced from this test shall then be tested for the ignitability characteristic.

4.7 QA/QC and Data Management

4.7.1 QA/QA of Sampling

As a requirement for the sampling effort, a laboratory will be selected that is qualified in performing the analyses described in Sections 4.4, 4.5, 4.6, and is certified by OEPA. The sample analysis report will include the following information: sample analyses results and detection limits, surrogate recoveries, and sample holding times, as well as analysis of blanks and duplicates.

The appropriate numbers of field blanks and duplicates will be collected to support the Quality Control (QC) program as described below. The commercial laboratory will provide laboratory-prepared trip blanks with each sample shipment as well as the internal blanks and spikes described below.

The field and laboratory quality control requirements will include the following:

- Ten percent of field duplicate collection and analysis per matrix;
- One trip blank per matrix per cooler;
- Five percent of matrix spike and matrix spike duplicate sample collection and analysis (per matrix); and
- There are also specified frequencies for laboratory blanks (1/20) and duplicates (1/20) required for the analytical quality control proposed for the investigation.

As described in Section 4.4, field blanks and duplicates will be analyzed as part of the quality assurance and quality control program for the field gas chromatograph.

4.7.2 Field Quality Control and Sample Handling Procedures

The procedures and protocols described in this section will be employed to document sample control and provide data regarding potential impacts of field sampling techniques, sample handling, and the application of the analytical methods on analytical data. These field procedures

will be conducted within the framework of the U.S. EPA Contract Laboratory Program (CLP), and in accordance with the U.S. EPA A Compendium of Field Operations Methods (1987). These procedures and protocols will aid in the evaluation of the precision, accuracy, and representativeness of the chemical analytical results for the samples collected.

4.7.3 Documentation

The forms contained in this section are activity-specific, and shall be considered an integral part of closure plan documentation. Every effort shall be taken to ensure that documentation is true, accurate, and current during the performance of the closure. The forms specified in this section include (see Appendix F):

Form 1 - Daily Field Log
Form 2 - Offsite Waste Shipment Log
Form 3 - Headspace Analysis Sample Log
Form 4 - Sampling Log
Form 5 - Chain-of-Custody

4.7.4 Field Sampling Designation

Each field sample will be assigned a unique sample identifier. This identifier will be used throughout the sample collection, analysis, and reporting activities. The sample identifier will be clearly shown on the chain-of-custody form, sample container labels, and will be linked to a sample location. Collected information will be recorded in field sampling log notebooks.
A standard numbering system shall be used to identify each sample taken in order to provide a tracking procedure for retrieval of information. Sample numbers shall be assigned as follows:

- Three-letter project identifier and a dash, e.g., DHR for Dow-Hanging Rock, followed by;

- A soil sample location number and a dash (e.g., SS-01, SS-02, etc.), soil characterization sample location number and a dash (e.g., SC-01, SC-02, etc.) and water characterization sample drum(s) and a dash (e.g., WC-01, WC-02, etc.);

- A two-digit indicator for the depth interval and a dash for soil samples; and
- A six-digit date identifier (to permit quick reference to field logs).

An example of a soil sample identification is as follows:

DHR-SS-01-02-010197

This example represents a soil sample taken from the number one sampling location at a depth of two feet below ground surface on January 1, 1997.

Prefixes used to identify matrix spike samples, matrix duplicates, and re-analyzed samples will be appended by the laboratory and included in the laboratory deliverables.

4.7.5 Sample Containment and Preservation

To limit chemical or physical changes in a sample during collection and transport, the sample containers will be clean prior to sampling activities and constructed of non-reactive materials.

Glass containers will be used when organic compounds are the analytes of interest. Soil samples will be collected until each container is full to retain anaerobic conditions. Once the sample container is full (and preserved), it will be sealed with a Teflon-lined screw cap. Water samples for VOCs will be collected in 40 ml glass vials with Teflon-lined silicon septum screw caps.

Sample preservation will be employed to ensure sample integrity. The preservation methods will include: pH control, chemical addition, and cooling/refrigeration to a temperature of 4°C ± 2°C. These methods will be performed to:

- Retard biological action;
- Retard hydrolysis of chemical compounds and complexes;

- Reduce volatility of constituents; and
- Reduce absorption effects.

Prior to any form of preservation, the following aqueous sample parameters will be measured and recorded :

- pH;
- Specific conductance; and
- Temperature.

These measurements will create a baseline database on the sample and provide sensitivity to the potential for bias in the sample handling procedure.

Once the laboratory receives the samples, laboratory personnel shall analyze them for previously mentioned parameters and produce a report with respect to Level IV data quality objectives (DQOs). Among the method parameters that the laboratory will provide in the final data package(s) are the following:

- Sample tracking documentation;
- Holding time and preservation documentation;
- Gas chromatograph/mass spectrometry (GC/MS) tuning criteria;
- Initial and continuing calibrations;
- System monitoring compound/surrogate spike recoveries for GC/MS analyses;
- Method blank results;
- Laboratory control sample results;

- Matrix spike/matrix spike duplicate results;
- Laboratory duplicates for metals analyses; and
- Internal standard areas and retention times for GC/MS analyses.

4.7.6 Sample Shipping and Chain-of-Custody Procedure

To document the collection of samples, as well as the handling, transport, and receipt of samples at the certified off-site laboratory, a standard Chain-of-Custody (COC) form will be completed. Copies of the signed COC forms will accompany samples to the laboratory and be maintained by Dow. The COC forms will be completed to include the following information:

- Project name, location;
- Field sampling personnel and contact personnel;
- Sample collection information;
  - sample I. D.
  - location
  - time and date of collection
  - type of sample
  - size and number of containers collected
  - analysis to be performed
  - any pertinent comments regarding the sample or samples collection
- Signature of sampler/transporter/receiver;
- Name and shipping reference number; and
- Dates of release/receipt.

Each sample container to be packaged shall be identified by an affixed label that, at a minimum, will detail:

- Site identification number;
- Sample identification date and time of collection;
- Analysis requested; and
- Preservation sampler's initials.

The lid of each sample jar will be tightened securely. Properly identified samples will be placed in resealable plastic bags. The samples will be placed into a sample cooler. Samples will be carefully packed to minimize the potential for breakage or spilling. Noncombustible, absorbent packing material (e.g., vermiculite, newspaper) must be placed between each sample. If necessary, cardboard dividers will also segregate samples from each other.

Ice in watertight resealable plastic bags will be placed around the samples and packing to ensure the samples are preserved to below 4°C until delivery to the laboratory. If shipping by courier, the appropriate COC forms shall accompany the samples in watertight packaging (plastic bags).

After packing, the containers will be sealed in accordance with COC requirements. The outside of the container will be marked "Environmental Sample(s)." If being shipped by courier, a properly completed airbill shall be taped to the outside of the container. Only one airbill is required for multiple containers going to the same destination. Multiple containers going to the same destination will be labeled as "1 of 3," "2 of 3," etc., to eliminate confusion.

5.0 Health and Safety

Health and Safety Plan (HASP) will be prepared for the closure. Closure work will be performed in accordance with the HASP. The Site Health and Safety Officer will provide site-specific training and reviews in reference to health and safety and work practice issues and related procedures, as required.

Prior to conducting work, non-Dow project personnel will participate in the Dow Health and Safety orientation for the Hanging Rock Plant. This training will include the names of personnel responsible for site safety and health, the actual safety and health hazards identified for this project package, the types of personal protective equipment identified for this work, a discussion of the work practices and engineering controls to be utilized to minimize hazards, and all components of the HASP.

In addition to the training outlined above, each employee will be required to present a copy of their initial 40-hour training certificate, a copy of their most recent 8-hour refresher training certificate, if applicable, and a copy of a medical clearance certificate which is signed by a licensed physician and clears them for work using respiratory protection and work on a hazardous waste project.

6.0 Closure Report

At the completion of the field work, the field operations and field crew will demobilize and leave the facility area. Project personnel will then prepare the closure report.

The closure report for the closure activities will include:

- Facility description;
- A description of procedures and conclusion of investigations to characterize the nature and extent of constituents in soil;
- Estimated volume and level of clean-up;
- Clean-up criteria;
- A description of the closure activities performed including transportation and disposal activities and records; and
- Results of confirmatory sampling and analysis.

A copy of the closure report will be provided to OEPA and another copy will be kept at the plant.

7.0 Schedule

The following calendar-day schedule will be implemented for closure activities and construction of the collection sump. Dow's desire is to initiate these activities early in September and complete them by early December to avoid winter issues. The schedule of activities is:

Day 0	The Closure Plan approval received from OEPA.
Day 1	Notify OEPA that closure activities will be initiated within 30 days.
Day 7	Mobilization to the site (within 7 days of notification).
Days 7 to 37	Excavation, confirmatory sampling and analysis*, disposal of wastes off-site (30 days).
Days 37 to 97	Construction of the collection sump and connecting piping and area restoration (60 days).**
Days 67 to 97	Preparation of final report and closure certification*** (30 days).
Day 100	Final report submittal to OEPA.

* The OEPA southeast district office will be notified 5 days prior to initiation of closure soil sampling activities.

** This estimated time may change based on weather conditions.

*** Independent certified engineer will certify the closure.

8.0 References

1. U.S. EPA Region V, *Preliminary Review/Visual Site Inspection Report*, Dow Chemical U.S.A., Hanging Rock Plant, Ironton, Ohio, EPA ID No. OHD039128913, March 1989.

2. OHM Remediatin Services Corp., *Closure Plan for the Old Drum Storage Area at the Dow Chemical Hanging Rock Plant in Ironton, Ohio*, May 31, 1991.

3. OHM Remediation Services Corp., *Amended RCRA Closure Plan, Phase III Soil and Soil Gas Sampling and Analysis for the RCRA Closure of Dow's Old Drum Storage Area,* Ironton, Ohio, February 19, 1993.

4. OHM Remediation Services Corp., *Preliminary Report for the RCRA Closure Activities Performed at the RCRA Old Drum Storage Area of Dow Chemical's USA Ironton, Ohio Facility,* August 10, 1993.

5. AWD, *Closure Plan Modifications, Old Drum Storage Area,* Hanging Rock Plant, Ironton, Ohio, prepared for the Dow Chemical Company, September 1993.

6. AWD, *Draft Revisions Closure Plan Modifications, Old Drum Storage Area*, Hanging Plant, Ironton, Ohio, prepared for the Dow Chemical Company, August 29, 1994.

RADIAN INTERNATIONAL LLC

APPENDIX A

CHRONOLOGY OF EVENTS

CLOSURE ACTIVITIES FOR THE FORMER DRUM STORAGE AREA

DOW HANGING ROCK PLANT

Chronology of Events
Closure Activities for the Former Drum Storage Area, Dow Hanging Rock Plant

Between 1978 and 1980:	Former Drum Storage Area was used to store 55 gallon drums with ignatible waste.
March 1989:	U.S. EPA Region V issued a Preliminary Review/Visual Site Inspection Report identifying potential solid waste management units (SWMUs) and describing them. The EPA report indicated a spill of approximately 50 gallons with styrene, ethylbenzene and partially polymerized polystyrene, at the Former Drum Storage Area, during clean-up procedures between 1978 and 1980.
April 26, 1991:	Ohio EPA issued an order to perform a formal closure of the Former Drum Storage Area.
May 31, 1991:	A closure plan for the Former Drum Storage Area was prepared by OHM Remediation Service Corp (OHM) and submitted to OEPA.
November 4, 1991:	OEPA approved the closure plan.
May 1992:	Phase I field closure activities were performed by OHM (collection of 22 soil samples and analyses for VOCs).
June 1992:	Phase II field closure activities were performed by OHM (excavation of two 16-foot x 16-foot areas to a depth of 1 to 1.5 feet and collection of three confirmatory soil samples).
February 1993:	Phase III field closure activities were performed by OHM (collection of 72 soil samples for soil-vapor analyses to determine the extent of constituents in the Former Drum Storage Area). The proposed activities were included in a February 19, 1993 Amended RCRA Closure Plan that was submitted to OEPA.
May 1993:	OHM Phase III soil-vapor data were interpreted by Dow Environmental, Inc. (DEI, formerly AWD Technologies) to identify a surface source (i.e. the Former Drum Storage Area) and a subsurface source (i.e. the process sewer line underlaying the Former Drum Storage Area).

July 21, 1993:	Process sewer line investigation was performed and confirmed the DEI interpretation of the soil-vapor data.
August 10, 1993:	OHM prepared a preliminary report for the RCRA closure activities, which summarized Phase I, II, and III soil sampling and analysis.
August 25, 1993:	OEPA recommened that Dow submit a closure plan modification.
September 1993:	A closure plan modification, prepared by DEI, was submitted to OEPA.
August 1994:	Draft Revisions to the Closure Plan were prepared by DEI and submitted to OEPA based on comments received from them.
September 1994:	OEPA requested that the extent at AN, EB, MC, and ST in soil be adequately defined, based on a review of the Draft Revisions to the Closure Plan.
October 1994:	Phase IV field closure activities were performed by DEI (78 soil samples were collected and 67 were analyzed for AN, EB, MC, and ST). A report was submitted in February 1995.
October 1995:	OEPA requested that additional soil sampling be done to assess the horizontal and vertical extent of constituents in soil adjacent to the process sewer line to the north of the Former Drum Storage Area, based on a review of the February 1995 Phase IV Sampling Report.
January 1996:	Supplemental Phase IV Sampling Program was implemented by DEI. A summary report was submitted to OEPA in March 1996.
April 1996:	Dow proposed a closure for the Former Drum Storage Area which included excavation and disposal of soil from the area of the process sewer line, an additional soil excavation to provide a space for a collection sump, and completion of the closure activities based on risk-based clean-up levels excluding the groundwater exposure pathways. This was based on results of the January 1996 study which showed no presence of groundwater to the depth of soil investigation. In addition, Dow proposed a voluntary closure of a section of the process sewer line extending to the north of the Former Drum Storage Area to manhole No 3.

May 1996:	OEPA concurred with the April 1996 Dow proposed approach and agreed that the groundwater pathway need not be considered in the development of risk-based soil clean-up levels. The OEPA letter led to the preparation of this closure plan.
July 1996:	Dow submits an Amended Closure Plan.

APPENDIX B

OHIO EPA CORRESPONDENCE

JUL 11 '96 16:12 517 638 9922 PAGE.002

OhioEPA
State of Ohio Environmental Protection Agency

Southeast District Office
2195 Front Street
Logan, Ohio 43138-9031
(614) 385-8501
FAX (614) 385-6490

George V. Voinovich
Governor

May 4, 1993

RE: LAWRENCE COUNTY
DOW CHEMICAL
RCRA/LQG-TSD
OHD039128912
04-44-0022

Dow Chemical Company
Hanging Rock Plant
Gilruth Lane
Ironton, Ohio 45638

Attn: Ms. Katherine Anderson

Dear Ms. Anderson:

On April 19, 1993, I met with you to discuss the status of the closure of the 'old drum storage area' unit at your facility. The closure plan for this unit was approved by the Director on November 4, 1991, with one time extension allowed by this office. Implementation of the plan has discovered contaminated soil at depth in a portion of the unit. A preliminary Phase 3 workplan was submitted to this office for initial review on March 2, 1993, involving the use of soil gas sampling and headspace analysis to determine the extent of contamination.

We discussed the results of the soil gas study at our meeting. The soil type at your facility was not porous enough to draw a soil gas sample, so soil samples were taken and headspace readings were made per the plan. Results were then confirmed by laboratory analysis. A plume in the unsaturated zone is apparent at depth in an area where a wastewater pipe runs toward the treatment plant. At the time of our meeting, you were unsure if the contamination resulted from minor releases from the pipe, or whether the backfill around the pipe was acting as a conduit for contamination from the drum storage unit. As we discussed, Ohio EPA must assume the contamination to be from the storage area unless Dow can demonstrate otherwise.

You have agreed to amend your approved closure plan to add the soil gas/headspace work already performed. The plan will also need to be amended to investigate the extent of the contamination out through the asphalt roadway, and in two sampling points the total depth of contamination. A demonstration from Dow about other possible sources of this plume would also be appropriate at the time the amended plan is submitted. Should Dow be unable to demonstrate the source is not the drum storage area, Ohio EPA

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must assume contamination originated from this unit. Dow is also considering amending the plan to include a risk-based closure performance standard.

A new schedule of implementation will also be necessary. Although Dow was slow to begin implementation of the initial plan, you have been most cooperative in striving for resolution of this closure. It was Ohio EPA's recommendation that amendment of the closure plan occur only once for the soil gas/headspace work and evaluation of any new alternate remedial measures once results were received from the extent of contamination study. Within thirty days from the date of this letter, please provide this office with correspondence to indicate the approximate timeframes for submitting an amended closure plan and schedule. Please indicate at that time which of the closure alternatives we discussed that you plan to pursue.

If you have any questions, or if I may be of further assistance, please feel free to call me at this office.

Sincerely,

Michael Moschell

Michael Moschell
Inspector
Division of Hazardous Waste Management

MM/jg

cc: Randy Meyer - DHWM, CO

OhioEPA
State of Ohio Environmental Protection Agency

Southeast District Office
2195 Front Street
Logan, Ohio 43138-8091
(614) 385-8501
FAX (614) 385-6490

George V. Voinovich
Governor

August 25, 1993

RE: LAWRENCE COUNTY
DOW CHEMICAL
RCRA - LQG, TSD
OHD039128912
04-44-0022

Dow Chemical Company
Hanging Rock Plant
ATTN: Ms. Kathy Anderson
Gilruth Lane
Ironton, Ohio 45638

Dear Ms. Anderson:

On August 6, 1993, this office received your letter and the report from AWD Technologies regarding the industrial sewer investigation performed in the area of the old drum storage area. This area is presently undergoing closure pursuant to an approved hazardous waste closure plan. In the course of sampling the soils in the area, Dow discovered contaminated soils at depth and began to investigate the potential cause as being a leak from the process sewer line which runs under this area.

AWD's findings conclude that the source of the ethylbenzene, styrene, and acrylonitrile contaminants in the soil samples resulted from leaks in the process sewer. Dow has concurred with the findings of this study and has requested Ohio EPA's concurrence before proceeding with submitting a closure plan modification to address this issue.

Based upon the information received and Dow's concurrence with the findings of this study, this office finds the conclusions reached to be reasonable and recommends Dow submit a closure plan modification to the Director of Ohio EPA pursuant to Ohio Administrative Code 3745-66-12. The submittal must include the findings of the study and describe Dow's new course of action based upon these findings. This office will then review the modification and advise Dow of either our approval or concerns about the proposal.

Please submit the modification to the Director, with a courtesy copy to this office as soon as possible, but at least within thirty days. If there are any questions or you encounter further problems, please call me at this office.

Sincerely,

Michael Moschell

Michael Moschell
Inspector
Division of Hazardous Waste Management

MM/mr

cc: Randy Meyer - DHWM, CO

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OhioEPA
State of Ohio Environmental Protection Agency

Southeast District Office
2195 Front Street
Logan, Ohio 43138-9031
(614) 385-8501
FAX (614) 385-6490

George V. Voinovich
Governor

October 16, 1995

RE: **LAWRENCE COUNTY**
DOW CHEMICAL CO.
RCRA - LQG, ST1
OHD039128913

Dow Chemical Company
Hanging Rock Plant
Gilruth Lane
Ironton, Ohio 45638

Attn: Mr. Kenan Stevick

Dear Sir:

It was a pleasure to meet with you and representatives from Dow Environmental, Inc. at your office on September 20, 1995, to discuss closure and remediation options for the old drum storage area and wastewater pipeline. The meeting resulted from Dow's proposal to utilize soil vapor extraction technology on a pilot basis to remedy the soil contamination at these contiguous units.

At the meeting, Ohio EPA raised the following concerns:

- the Northern extent of contamination is not adequately defined along the pipeline;
- the vertical extent of contamination has not been defined;
- Dow has not determined if groundwater contamination has resulted from the pipeline's contaminant release;
- the depth and flow direction of groundwater is not known at this unit, but is generally known for the area;
- soils in this area may not be amenable to soil vapor extraction, due to their clay content.

These areas need additional work in order to better design an effective treatment system.

During our discussions, Dow Environmental representatives asked what the agency's minimum requirements would be for remediation. I responded that, at least, Dow must complete closure of the storage pad to RCRA standards: either by clean closure treatment/removal or risk assessment. Since the pipeline release was a corrective action issue, Dow has several options open to them.

Ohio EPA strongly encourages Dow to remedy the pipeline release voluntarily, rather than waiting for the agency to take legal action. Should Dow decide to remedy both units, we discussed several actions needed to better assess the area prior to designing a remedial action:

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- take additional soil samples to define the Northern extent of contamination along the pipeline;
- take soil samples at location 53C to determine the vertical extent of contamination [this location had the highest concentration of contaminants at the greatest depth sampled];
- should contaminants be found in the soils at the seasonal high water table, groundwater monitoring wells should be installed in sufficient numbers to detect the release and determine the groundwater's depth and direction of flow. Sampling soils to the water table may not be required if contaminants are not detected for three consecutive sampling intervals below the last detection point, when sampling in the vertical plane.

We agreed that within thirty days of the date of this letter, Dow would respond with a letter stating their course of action. That letter would be followed by whatever workplans or revisions were necessary to accomplish the task. Dow would seek Ohio EPA's concurrence on the technical aspects of their proposal. Dow is advised to closely follow any federal or state guidance with regard to corrective action to prevent duplication of effort.

Should you have any questions or need assistance, please call me at this office.

Sincerely,

Michael Moschell
Inspector
Division of Hazardous Waste Management

MM/mr

cc: S. Jane Jacobs - DDAGW, SEDO
cc: Laurie Stevenson - DHWM, CO
cc: Montee Suleiman - DHWM, CO

OhioEPA
State of Ohio Environmental Protection Agency

Southeast District Office
2195 Front Street
Logan, Ohio 43138-9031
(614) 385-8501
FAX (614) 385-6490

George V. Voinovich
Governor

May 10, 1996

RE: LAWRENCE COUNTY
DOW CHEMICAL
RCRA-ST1, LQG
OHD039128913

Dow Chemical Company
Hanging Rock Plant
Gilruth Lane
Ironton, Ohio 45638

Attn: Mr. Dennis Stanley

Dear Sir:

Your letter of April 23, 1996, concerning the remediation of the old drum storage area and pipeline, has been received and reviewed. Following my discussion with Montee Suleiman, leader of our RCRA Closure Unit in Ohio EPA's Central Office, I can inform you that we concur with the approach you describe. In particular, Dow's most recent sampling efforts have determined the extent of contamination lies above the water table by at least three sampling intervals. Therefore, we agree that the groundwater pathway need not be considered in the risk assessment for the soils in the old drum storage area.

Dow should be advised, however, that all reasonable efforts should be made to remove the contaminated soils from the lower reaches of the excavation below the pipeline. Higher levels of contaminants in this area, as shown by your sampling results, could result in a future release to groundwater. The Toxicity Characteristic Leaching Procedure (TCLP) may be used for samples of the soil in this area as a guideline for determining if additional soil requires removal. Because Dow is voluntarily removing contaminants resulting from this pipeline, conducting a risk assessment on the levels of contaminants remaining in soils in this area is at your option.

Please provide Ohio EPA with an amended closure plan for the old drum storage area as soon as possible. There is currently a statewide backlog of risk assessment plans awaiting review, and we will make an effort to assist you in meeting the timelines your letter describes. Should you have any questions or encounter problems, please call.

Sincerely,

Michael Moschell
Inspector
Division of Hazardous Waste Management

MM/jg

cc: Montee Suleiman - DHWM, CO

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APPENDIX C

PROCESS SEWER PIPELINE INVESTIGATION REPORT

AWD
TECHNOLOGIES

A Subsidiary of
The Dow Chemical Company

PGH-93-KAM-871

August 4, 1993

Mr. Joe Heil
The Dow Chemical Company
Hanging Rock Plant
Route 52 Box 253
Ironton, Ohio 45638

Subject: Old Drum Storage Area Pipeline Investigation

Dear Joe:

This letter summarizes the findings of AWD Technologies, Inc. (AWD) following the recent pipeline investigation at the Old Drum Storage Area.

The purpose of this investigation was to determine if there is a connection between the subsurface contamination of ethylbenzene (EB), styrene (ST), and acrylonitrile (AN) in the Old Drum Storage area, and the sewer line that bisects this area from north to south. A two-part investigation was performed. The first part of the study focused on the wastewater discharged to the pipeline. The second involved a physical inspection of the line for cracks and joints.

Wastewater Discharge

The wastewater line was installed in 1968 for the purpose of collecting process water from the Styron™/ABS plant and transporting the water to the wastewater treatment plant. Raw materials used in the plant (ST, EB, and AN) would have been present in the process water at various concentrations. Prior to 1980 higher concentrations of these materials were present in the wastewater stream. In fact, it would be normal to find an organic layer present in the wastewater collection pit (at the end of the wastewater line) indicating the presence of these organics in the pipeline. However, since 1980, improved plant operating procedures have decreased the chance of higher concentrations of contaminants being present in the wastewater stream.

AWD Technologies, Inc.
Penn Center West Building III Suite 300 Pittsburgh Pennsylvania 15276 Telephone 412 788 2717 Fax 412 788 1316

Physical Inspection

On July 21, 1993, a television camera inspection of the section of wastewater pipeline that lies beneath the Old Drum Storage Area was performed. The work was performed by Robinson Pipe Cleaning Company (Robinson) under contract to AWD.

Figure 1 illustrates the section of pipeline that was inspected. The pipeline consists of 10 inch diameter cement sections, each approximately 12.5 feet in length. The line was installed in 1968 and is about 8 feet below grade. Flow is from north to south. The inspection was performed from manhole number 3 to manhole number 2.

The pipeline inspection clearly identified the locations of all pipe joints. These have been plotted with their corresponding distance relative to manhole number 3, on Figure 1. In addition, it was possible to examine the condition of the line. Areas of significant product buildup were noted in several locations. These locations are thought to be areas where organics may have leaked from the wastewater line, accumulated over time, and polymerized to coat the line. Most notably, two areas of significant product buildup were located near two of the highest subsurface headspace sample points (Table 1, 49A and 11A) on Figure 1. It also should be noted that locations of all headspace sample points that showed contamination at 8 feet to 9 feet level and 11 feet and 12 feet (except point 20A) correlated with the location of joints in the wastewater line.

Based on the above findings we conclude that the subsurface contamination of EB, ST, and AN was caused by organics leaking from the wastewater line, not a spill of hazardous waste from the Old Drum Storage Area.

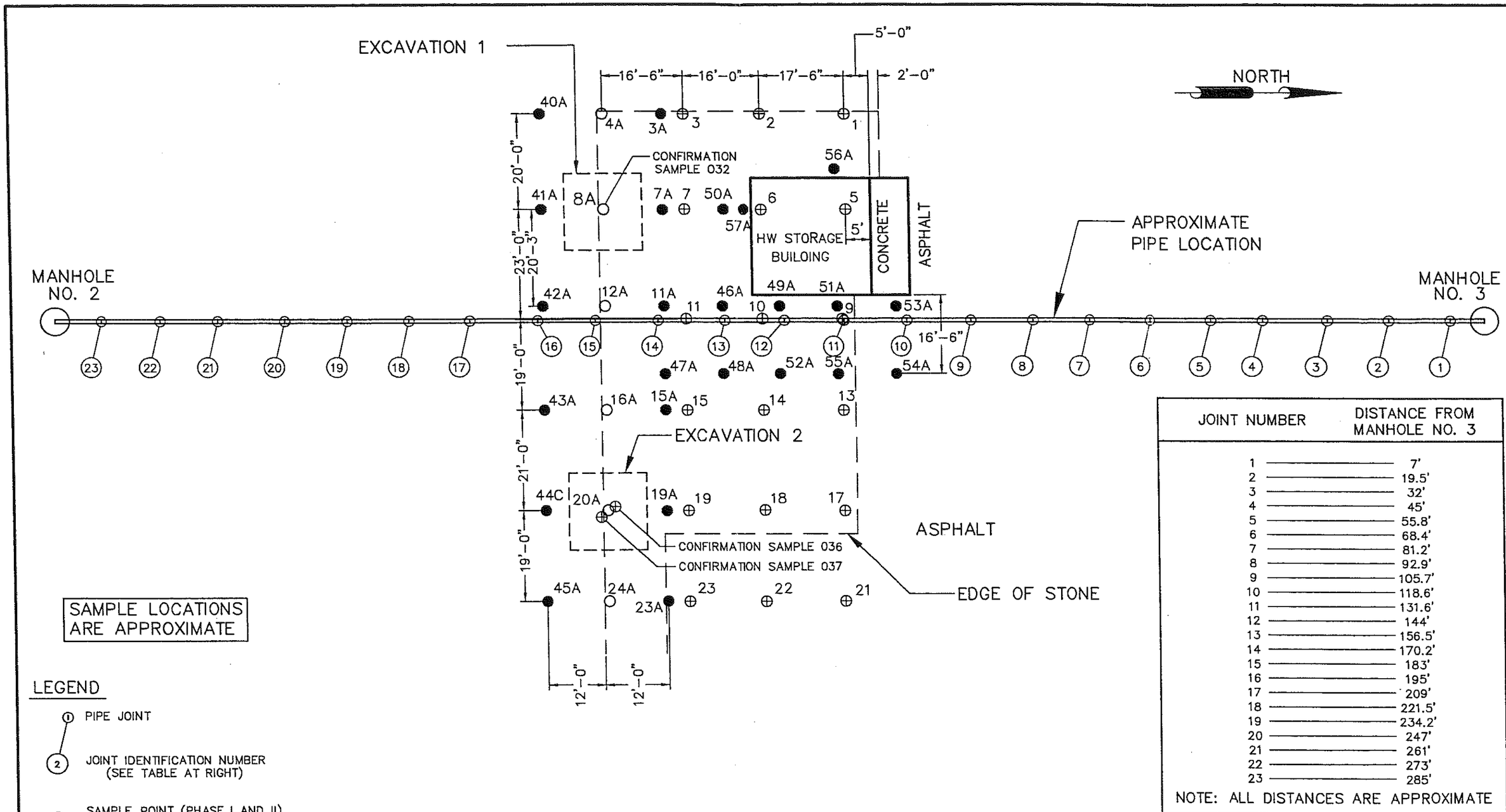
If you have any questions, please do not hesitate to call me at (412) 788-2717.

Very truly yours,

Kristian A. Macoskey
Senior Permitting and Air Quality Specialist

KAM/slk

Enclosures: Figure 1 - Sample Locations & Pipeline Configuration
Table 1 - Summary of Phase III Headspace Soil Data



JOINT NUMBER	DISTANCE FROM MANHOLE NO. 3
1	7'
2	19.5'
3	32'
4	45'
5	55.8'
6	68.4'
7	81.2'
8	92.9'
9	105.7'
10	118.6'
11	131.6'
12	144'
13	156.5'
14	170.2'
15	183'
16	195'
17	209'
18	221.5'
19	234.2'
20	247'
21	261'
22	273'
23	285'

NOTE: ALL DISTANCES ARE APPROXIMATE

SAMPLE LOCATIONS ARE APPROXIMATE

LEGEND

- ① PIPE JOINT
- ② JOINT IDENTIFICATION NUMBER (SEE TABLE AT RIGHT)
- ⊕ SAMPLE POINT (PHASE I AND II) (SAMPLES WERE NOT COLLECTED AT SAMPLE POINTS 5 AND 6)

HEADSPACE SAMPLES

- ● SAMPLES COLLECTED FROM 2'-3', 5'-6', 8'-9' (PHASE III)
- ○ SAMPLES COLLECTED FROM 5'-6', 8'-9' (PHASE III)

0 20 40
SCALE IN FEET

0077227799335KRGTH

AWD TECHNOLOGIES, INC.

AWD TECHNOLOGIES

SAMPLE LOCATIONS AND PIPELINE CONFIGURATION OLD DRUM STORAGE AREA

HANGING ROCK — IRONTON, OHIO

CLIENT: DOW CHEMICAL USA		JOB NUMBER: 7015.100
SCALE: AS SHOWN	FIGURE NUMBER 1	REV 0

FILE: \HANGROCK\FIGURE1.DWG

TABLE 1
SUMMARY OF PHASE III HEADSPACE SOIL DATA
ALONG PIPELINE TRANSECT

Depth Below Surface (ft)	Parameter	Headspace Concentration (ppm) at Sample Point																												
		3A	4A	7A	8A	11A	12A	15A	16A	19A	20A	23A	24A	40A	41A	42A	43A	44A	45A	46A	47A	48A	49A	50A	51A	52A	53A	54A	55A	56A	57A
2 to 3	Ethylbenzene	ND	ND	ND	--	0.701	ND	ND	0.149	0.016	--	ND	ND	ND	ND	ND	ND	ND	ND	0.328	ND	0.023	0.159	ND	0.735	0.224	0.36	0.037	0.42	ND	ND
	Acrylonitrile	ND	ND	ND	--	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Styrene	ND	ND	ND	--	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Methylene chloride	ND	ND	ND	--	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.81	ND	0.447	ND	0.254	ND	0.14	ND	ND
5 to 6	Ethylbenzene	ND	ND	ND	0.533	4.17	ND	ND	ND	ND	1.03	ND	ND	ND	ND	ND	ND	ND	ND	3.58	ND	ND	1.13	ND	1.14	ND	1.76	0.39	ND	ND	ND
	Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Styrene	ND	ND	ND	ND	0.228	ND	ND	ND	ND	0.67	ND	ND	ND	ND	ND	ND	ND	ND	0.409	ND	ND	0.242	ND	0.331	ND	0.728	0.135	ND	ND	ND
	Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.75	ND	0.874	ND	0.724	ND	ND	ND	ND
8 to 9	Ethylbenzene	--	--	--	--	13.1	--	--	--	--	0.108	--	--	--	--	--	--	--	--	1.48	--	--	6.86	--	2.0	--	5.79	--	--	--	--
	Acrylonitrile	--	--	--	--	4.83	--	--	--	--	ND	--	--	--	--	--	--	--	--	ND	--	--	ND	--	ND	--	ND	--	--	--	--
	Styrene	--	--	--	--	1.26	--	--	--	--	ND	--	--	--	--	--	--	--	--	0.182	--	--	1.91	--	0.542	--	0.393	--	--	--	--
	Methylene chloride	--	--	--	--	ND	--	--	--	--	ND	--	--	--	--	--	--	--	--	ND	--	--	1.36	--	0.818	--	0.385	--	--	--	--
11 to 12	Ethylbenzene	--	--	--	--	0.089	--	--	--	--	--	--	--	--	--	--	--	--	--	0.251	--	--	10.0	--	2.72	--	4.38	--	--	--	--
	Acrylonitrile	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	6.78	--	--	11.9	--	ND	--	ND	--	--	--	--
	Styrene	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	1.93	--	1.38	--	3.18	--	--	--	--
	Methylene chloride	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	ND	--	ND	--	ND	--	--	--	--

-- Denotes no sample collected at this depth.
ND Denotes Not Detected

PHASE IV SAMPLING REPORT AND MANAGEMENT PLAN

FOR

FORMER DRUM STORAGE AREA HANGING ROCK PLANT IRONTON, OHIO

VOLUME ONE: TEXT

PREPARED FOR

THE DOW CHEMICAL COMPANY

PREPARED BY

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PITTSBURGH, PENNSYLVANIA

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EXECUTIVE SUMMARY

The Dow Chemical Company (Dow) Hanging Rock plant in Ironton, Ohio has undergone various phases of investigation from 1992 to the present. The investigations have focused on an approximately 50 foot x 100 foot Former Drum Storage Area which contains a less than 90-day RCRA hazardous waste storage building. To-date, four phases of investigation have been conducted, the focus of which have been to better define the extent and concentration of subsurface contamination in this area. In May 1992, a Phase I investigation was conducted to define the horizontal extent of acrylonitrile (AN), ethylbenzene (EB), methylene chloride (MC), and styrene (ST) via surface soil sampling. A Phase II investigation in 1992 involved excavation and confirmation sampling of two 16 foot x 16 foot areas. In February 1993, a Phase III investigation was conducted to further define the vertical and horizontal extent of contamination via headspace sampling at various depths. A pipeline investigation was conducted in July 1993 to demonstrate that the subsurface contamination identified in the earlier phases of work was caused by a source other than the Former Drum Storage Area. This investigation targeted a process sewer line underlying the area.

A Closure Plan Modification, which addressed all phases of work conducted to-date, was submitted to the Ohio Environmental Protection Agency (OEPA) in September 1993. Draft revisions which addressed OEPA's comments to the plan were submitted to the OEPA in August 1994. Upon review of the revised plan, the OEPA requested that the extent of the four previously-identified soil contaminants (AN, EB, MC, and ST) as well as barium be adequately identified. This Phase IV report presents the results of the soil sampling conducted in October 1994 to achieve this objective. The Phase IV investigation determined that elevated concentrations of the four contaminants are present both within as well as to the north of the Former Drum Storage Area.

Due to the fact that this area is adjacent to other known Solid Waste Management Units, including the process sewer line beneath the area, it is recommended that a migration minimization and monitoring program be implemented pending implementation of Corrective Action for the facility as a whole. This will be accomplished through the installation of a geosynthetic clay liner with a geocomposite drainage net. The monitoring program will consist of a limited hydrologic investigation involving the installation of three shallow monitoring wells, and groundwater sampling will be used to monitor the potential for offsite migration of groundwater that may be impacted by the Former Drum Storage Area.

1.0 INTRODUCTION

This report, prepared by Dow Environmental Inc. (DEI), presents the results of Phase IV soil sampling conducted in and around the Former Drum Storage Area at The Dow Chemical Company (Dow) Hanging Rock plant in Ironton, Ohio during October 1994. In addition, this report describes a plan to monitor and reduce migration of contamination present at the Former Drum Storage Area pending implementation of Corrective Action for the facility as a whole.

The Dow Hanging Rock plant is located on a 560-acre site in Hamilton Township in southeastern Lawrence County, Ohio (see Figure 1). The site is bounded by the Ohio River to the south, U.S. Route 52 to the north and east, and the Lawrence-Scioto County line to the west. The Former Drum Storage Area is located in the west central portion of the facility (see Figure 2). The dimensions of the area are approximately 50 feet x 100 feet. The site is relatively flat and consists of vegetated gravel soil. The surrounding areas include an asphalt roadway to the north and east, grassy areas to the west, and a water treatment area to the south. A 25 foot x 25 foot less than 90-day RCRA hazardous waste storage building is present within the Former Drum Storage Area, on its northern perimeter (see Figure 3).

Three phases of field sampling have previously been conducted at this site. Phase I, performed in May 1992, consisted of surface soil sampling at 28 locations to define the horizontal extent of acrylonitrile (AN), ethylbenzene (EB), methylene chloride (MC), and styrene (ST) contamination. Phase II, also performed in 1992, involved excavation and confirmation sampling of two 16 foot by 16 foot areas shown on Figure 3. Phase III was performed in February 1993. During Phase III, headspace sampling was performed throughout the Former Drum Storage Area at various depths to define the vertical and horizontal extent of contamination.

In May 1993, the Ohio Environmental Protection Agency (OEPA) indicated that Dow had agreed to amend the approved Closure Plan to include the February 1993 headspace data (OEPA, 1993a). The OEPA indicated that among other things, Dow could include a demonstration that the subsurface contamination could have been caused by a source other than the Former Drum Storage Area.

A pipeline investigation was subsequently performed on July 21, 1993. The study, which is included as Appendix A of the Closure Plan Modification (AWD, 1993), indicated that there was evidence that the process sewer line underlying the Former Drum Storage Area could be the source of AN, ST, and EB contamination. OEPA accepted Dow's interpretation of the subsurface contamination source on August 25, 1993 (OEPA, 1993b). At that time, OEPA recommended that Dow submit a Closure Plan Modification. The Closure Plan Modification was submitted in September 1993 (AWD, 1993).

Comments on the Closure Plan Modification were received from OEPA, Division of Hazardous Waste Management (DHWM) in August 1994. Draft revisions to the Closure Plan Modification were submitted to the OEPA on August 29, 1994 (AWD, 1994). Following review of the draft revisions, the OEPA requested that the extent of soil contamination of the four previously-identified volatile organics plus barium be adequately defined. This report presents the results of sampling conducted to achieve that objective.

2.0 PHASE IV SAMPLING

2.1 Objectives

The Phase IV soil sampling reported herein was performed at the request of the OEPA DHWM following their review of a proposed Closure Plan Modification (AWD, 1993 and 1994). Specifically, Dow was asked to confirm that the extent of acrylonitrile, ethylbenzene, methylene chloride, and styrene contamination at the Former Drum Storage Area had been adequately defined, both horizontally and vertically. The goal was to demonstrate three points of decreasing soil concentration in the horizontal plane away from the Former Drum Storage Area in all directions. Samples were also to be collected to coincide with former headspace sampling to confirm the vertical extent of contamination. The Phase IV data were to be used to confirm that soil concentrations used in the risk-based component of the Closure Plan Modification were representative of worst-case conditions. In addition, the data would help to define the proposed extent of excavation for the remedial phase of the RCRA closure. Dow was also asked to define the extent of contamination for barium in soil. Samples collected to define volatile organic concentrations were therefore analyzed for barium as well. Samples were collected from an adjacent field and analyzed for barium to define the local background concentration of this naturally-occurring material.

2.2 Methods

2.2.1 Soil Sampling

Soil sampling was performed on October 20, 21, and 22, 1994 according to procedures defined in the Sampling and Analysis Plan attached as Appendix A. A summary of sampling methods, including discrepancies from the Sampling and Analysis Plan, is provided below.

Sample Locations - Barium Background

Twelve soil samples were collected from Dow property south of the investigation area to be analyzed for background barium concentrations. The locations of these samples are shown in Figure 4. This area was determined by a DEI geologist to represent the same soil horizon as material sampled at the Former Drum Storage Area. Three borings were installed (BG-1, BG-2,

and BG-3). From each boring, samples were collected at four depth intervals: 0 to 2 feet, 2 to 4 feet, 4 to 6 feet, and 6 to 8 feet.

Sample Locations - VOC Vertical and Horizontal Extent

Soil sampling was conducted at 35 locations in and around the Former Drum Storage Area. These locations, shown in Figure 5, were defined in an attempt to demonstrate three decreasing soil concentration locations relative to the Former Drum Storage Area. Each location was sampled at one or more depths, as shown in Table 1. Samples were collected from 2-foot depth intervals ranging from the surface to 11 feet, depending on the location. This is a discrepancy from the Sampling and Analysis Plan wherein a 1-foot sample interval was specified. The samples do however represent the depths specified in the Plan. In total, 78 soil samples were collected to define the horizontal and vertical extent of contamination. (This is one more than the 77 samples indicated in Table 1 of the Sampling and Analysis Plan because a sample was collected at 9 to 11 feet at location 53C.) This total does not include 24 soil and 2 liquid samples collected for QA/QC as described in Section 2.2.3.

Soil borings were in some cases offset when subsurface obstructions were encountered or no sample was retrieved. In these cases, the sample location was offset within 1 foot of the originally, intended location. Offset samples are indicated in Table 1.

Sampling Methods

Soil sampling was conducted with the Geoprobe® sampling system. Borings were drilled with a truck-mounted Geoprobe® system to depths indicated in Table 1. An approximately 1.75-inch diameter boring was made with a hydraulic hammer that advanced a threaded push rod to the desired depth. Soil samples were obtained by loosening the drive point of the push rod and inserting a smaller diameter threaded rod through the drilling string. The smaller rod was used to loosen the drive point and the sample was collected by advancing the drill string with the hydraulic hammer. After collection, the drill rod was removed from the borehole. The soil sample contained within the drive point sampler in a clean acetate liner, was pushed out of the outer sampling tube and containerized for shipment to the laboratory.

As indicated above, obstructions were encountered at the surface in a few boring locations (49A, 51A, 53A) adjacent to the Hazardous Waste Storage Building. To conduct sampling in these

locations, an offset boring was started with a drill bit attachment to advance through the cobble-size fill material. Sampling began at the contact between the base of the fill material and at the top of the clay and silt layer. Additionally, in cases when no sample recovery occurred, an offset location was drilled to collect samples from the missed sample depth intervals of the original borehole.

Sample Preparation

Following sample collection, samples were placed in 8-ounce glass jars. The jars were sealed and labeled according to a predetermined numbering system, as described in the Sampling and Analysis Plan. Samples were placed in coolers with ice packs to maintain approximately 4°C throughout shipment to the offsite laboratory.

Equipment Decontamination

Decontamination of sampling equipment was performed at the beginning and end of each sampling event. Sample recovery rods were decontaminated between the collection of individual samples. Trowels used for surface sampling were decontaminated prior to collection of each sample.

The following procedure was used to decontaminate sampling equipment:

- Soil adhering to equipment was brushed off (dry)
- Equipment was rinsed and/or brushed with clean water
- Equipment was washed with detergent
- A potable water rinse was performed
- A deionized water rinse was performed
- The equipment was air dried prior to reuse

Wash water generated in this manner was collected in buckets and transferred to onsite hazardous waste storage containers pending further characterization.

2.2.2 Laboratory Analysis

Field Samples

Sixty-seven samples were analyzed for acrylonitrile, ethylbenzene, methylene chloride, and styrene by U.S. EPA SW-846 Method 8240A (U.S. EPA, 1986). The remaining 11 of 78 total samples collected were not analyzed because data from those locations were not needed to identify three decreasing points of concentration. These 11 samples are identified in Table 1. Samples were also analyzed for barium by U.S. EPA SW-846 Method 6010A (U.S. EPA, 1986). (Note: Use of Method 6010A is a deviation from the Sampling and Analysis Plan [AWD, 1994] that was made because the very low detection limits of Method 7080 were not needed to detect the background soil concentrations found in and around the site.) Samples were also analyzed for percent moisture by U.S. EPA Method 160.3 (modified) (U.S. EPA, 1983). This analysis was needed to allow for reporting of soil concentrations on a dry weight basis, although the analysis was not specified in the approved Sampling and Analysis Plan.

Quality Assurance/Quality Control Samples

Twenty-six samples were analyzed for quality assurance/quality control (QA/QC) purposes, as summarized in Table 2. Fourteen QA/QC samples were analyzed as duplicates. Of these 14, 8 were analyzed for barium (12 percent of the total samples analyzed) and 9 were analyzed for acrylonitrile, ethylbenzene, methylene chloride, and styrene (13 percent of the total samples analyzed). These percentages exceed the 10 percent criteria established for field duplicates in the Sampling and Analysis Plan.

Four matrix spike duplicates and six matrix spikes were analyzed for both barium and the four organics. The specified 5 percent matrix spike and matrix spike duplicate sample analysis was exceeded in both cases. One field blank and one trip blank were analyzed. These blanks were found to be free of the analyzed compounds.

2.2.3 Data Validation

All analysis results for environmental samples were validated according to the U.S. EPA's National Functional Guidelines for Organic Data Review (June, 1991), the U.S. EPA's

Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses (July, 1988), and with reference to method requirements.

The organic analytical data were evaluated by the following QA/QC parameters where applicable: holding times, initial and continuing calibrations, system monitoring compound/surrogate spike recoveries, method blanks, field duplicates, laboratory control samples, matrix spike/matrix spike duplicates (MS/MSDs), analytical sequence, compound identification quantitation, and transcription.

The inorganic analytical data were evaluated by the following QA/QC parameters where applicable: holding times, initial and continuing calibrations, laboratory blanks, ICP interference check samples, ICP serial dilutions, and transcription.

The percent moisture analyses were evaluated by using the QA/QC parameters of laboratory control standard comparisons and duplicate analyses of environmental samples.

2.3 Results

Table 3 summarizes the results of the Phase IV soil sampling. Figures 6, 7, 8, and 9, illustrate detected soil concentrations for volatile organics and barium. The following subsections present the volatile organic and barium data, respectively.

2.3.1 Volatile Organics

Concentrations of individual volatile organic compounds detected in and around the Former Drum Storage Area ranged from nondetect (<6 μg/kg) to 1,400,000 μg/kg (0.14 percent). The following discussions describe VOC data within each of the four analyzed soil depth intervals.

Surface to Three Feet

Detected VOC concentrations from this depth interval, which includes soil samples collected from both the surface to 2-foot interval and the 1-foot to 3-foot interval, are reported together on Figure 6. VOC concentrations at this depth ranged from nondetect to 88 μg/kg (styrene). Ethylbenzene (EB), styrene (ST), and methylene chloride (MC) were detected in these samples although MC was found in only one location. Concentrations near the method detection limit

were detected at locations 20B (7 μg/kg EB), 20C (7 μg/kg MC), and 43B (9 μg/kg EB). EB and ST were detected at locations 53B (76 μg/kg EB and 88 μg/kg ST) and 53C (30 μg/kg EB and 74 μg/kg ST). Ethylbenzene alone was detected near the method detection limits at location 53D (10 μg/kg). As shown in Table 3, EB and ST concentrations reported for location 53C were qualified during data validation as "J", estimated. This indicates that although the analyte is present, the reported value may not be accurate or precise.

Two to Five Feet

Detected VOC concentrations from this depth interval are reported on Figure 7. Ethylbenzene and/or styrene were detected in 9 of 22 samples collected from this depth. EB concentrations ranged from 8 μg/kg to 17,000 μg/kg (51A). Styrene concentrations ranged from 14 μg/kg to 7,600 μg/kg (51A). As for the surface soils, location 53B, 53C, and 53D exhibited elevated concentrations. Additional sample locations along the same north to south transect also exhibited elevated concentrations (i.e., 11A, 46A, 49A, and 51A). Location 8B, near one of the areas excavated during Phase II (1992), also displayed elevated EB concentrations (200 μg/kg). No data in this depth interval were qualified during data validation.

Four to Seven Feet

The highest VOC concentrations detected at the site were found within this soil layer. These data are shown in Figure 8. VOCs were detected at 11 of 19 locations. Detected concentrations ranged from 18 μg/kg MC (location 53D) to over 1,000,000 μg/kg EB (location 53B). Location 53D contained the only detectable concentrations of methylene chloride (18 μg/kg) and acrylonitrile (270 μg/kg) in this soil layer. EB and ST were found in all samples along the north-south transect between points 11A and 53D. Points 11A (570,000 μg/kg EB and 530,000 μg/kg ST) and 53B (1,400,000 μg/kg EB and 950,000 μg/kg ST) displayed the highest concentrations measured on site. Note, however, that EB and ST data at these points were qualified "J" during data validation. This indicates that the analytes are present but the values are estimated. Similarly, detected concentrations at locations 8B, 51B, and 53A are similarly qualified "J." Two analytes that were not detected at location 51A, acrylonitrile and methylene chloride, are qualified as estimated "UJ", as well.

Six to Eleven Feet

VOCs were detected at four of the six locations sampled in this depth interval as shown in Figure 9. Location 20B displayed 27 μg/kg EB and 53 μg/kg ST at a depth of 6 to 8 feet. The other contamination at this depth was found at locations 53B, 53C, and 53D. Location 53B (7 to 9 feet) contained 210,000 μg/kg EB and 81,000 μg/kg ST (both qualified as "J" estimated). Location 53C contained 520,000 μg/kg EB at 7 to 9 feet and 170,000 μg/kg at 9 to 11 feet. ST was detected at this location at 200,000 μg/kg (7 to 9 feet) and 54,000 μg/kg (9 to 11 feet). All four volatile organics were detected at location 53D. The reported concentrations were 870 μg/kg EB, 190 μg/kg AN, 490 μg/kg ST, and 40 μg/kg MC. None of the data from this depth interval was qualified.

Overview of VOC Results

Figures 10 and 11 illustrate the vertical profiles of EB and ST concentrations, respectively, along the north-south transect between sample points 11A and 53D. This alignment coincides well with the subsurface process sewer line that transects the Former Drum Storage Area at approximately 8 feet below grade. It is felt that soil concentrations present in the surface to 3 foot interval cannot be attributed to the process sewer line. As shown in these figures, a distinct subsurface source of EB and ST contamination is indicated at location 53B. Concentrations decrease away from the maxima at a depth of 5 to 7 feet. In addition, a maximum subsurface concentration of EB and ST is indicated at location 11A (4 to 6 feet).

2.3.2 Barium

2.3.2.1 Background Concentrations

Twelve background soil samples were collected and analyzed for barium. The concentrations detected in those samples are summarized in Table 4. These data pass the Kolmogorov-Smirnov test (OEPA, 1993c) for normality at the 95 percent confidence level. However, a natural log transform has been applied to enable comparison to the samples collected onsite. The action level for barium soil concentrations based on OEPA background data, i.e., the upper confidence limit, is 5.265 (ln mg/kg) or 193.4 mg/kg for this site.

2.3.2.2 Onsite Concentrations

The results of 67 soil samples that were analyzed for barium are shown in Table 3. These data as a whole do not pass the Kolmogorov-Smirnov test for normality. Following a natural log transformation, the data do pass the normality test. The transformed data are depicted graphically in Figure 12. As shown, one sample exceeds the background action level of 5.265 ln mg/kg (193.4 mg/kg). This sample, 53C at 5 to 7 feet, is reported as 5.74 ln mg/kg (313 mg/kg).

3.0 MANAGEMENT OPTIONS

3.1 Clean Closure

The Closure Plan Modification currently under review calls for excavation of contaminated soils at the Former Drum Storage Area. That plan proposes clean closure of the Former Drum Storage Area that adjoins Solid Waste Management Units (SWMUs). These SWMUs, most importantly the process sewer system, were identified by A.T. Kearney, Inc. and DPRA Inc. under contract to U.S. EPA Region V in 1989 (Kearney and DPRA, 1989).

The Phase IV sampling results discussed above confirm the presence of the process sewer line SWMU beneath and north of the Former Drum Storage Area. Given the location of the Ohio River to the south and topographic relief to the north, it is likely that groundwater flow is from north to south. This places the Former Drum Storage Area downgradient of the Process Sewer Line SWMU and the bulk of the manufacturing areas of the facility. As a result, DEI feels that there is the potential for the Former Drum Storage Area to become recontaminated if it were clean closed.

At this time, it is felt that clean closure of the Former Drum Storage Area is not possible due to the impact of the other SWMUs onsite. Therefore, DEI proposes that a migration minimization and monitoring program be implemented. Closure will then be based on the implementation of the migration minimization and monitoring program, which is described below.

DEI believes that this approach will protect human health and the environment to the same extent that the removal of contaminated soils would. The primary route of potential human exposure to soil contaminants will be via groundwater. This is because the current and future land use of the site is industrial. There is no possibility that onsite residential exposure scenarios would be realistic for the Former Drum Storage Area. The potential does exist, however, for leaching of site contaminants to groundwater and subsequent transport to the Ohio River or other offsite receptors. Therefore, DEI proposes that future infiltration of water into the Former Drum Storage Area be prevented and that groundwater be monitored downgradient of the Former Drum Storage Area to assess the potential for exposure via the groundwater pathway. At some

future date, Corrective Action will address the facility as a whole, including the Former Drum Storage Area as well as other SWMUs present at the site.

It is DEI's understanding that precedents exist in the state of Ohio for deferring closure of a RCRA area that adjoins known SWMUs. Mr. Dave Sholtes, Assistant Chief of the OEPA OHWM has stated that Wright Patterson Air Force Base and the Fernald Facility both contain small storage facilities located among larger SWMUs (Porter, Wright, Morris, & Arthur, 1995). Remediation of these small areas has not been required by OEPA. So long as the delay in final closure of the storage area does not endanger human health or the environment and is not being requested merely to postpone the remediation, the OEPA sees no reason to insist on immediate clean closure.

3.2 Migration Minimization

As discussed above, the primary pathway for offsite exposure to Former Drum Storage Area contaminants is through leaching of contaminants to groundwater. As such, the highest priority should be placed on preventing the infiltration of rainwater and surface runoff into this area.

Three alternatives for covering the site are presented below. The alternatives are listed in order of most efficient to least efficient in minimizing rainfall percolation.

3.2.1 Alternative 1: High Density Polyethylene (HDPE) Cover

Alternative 1 is an exposed HDPE membrane placed on a graded subbase over the storage area. A liner such as 20 mil Permalon, or similar material, would be used. This material is essentially impermeable when used in this application.

This alternative includes grading the area and placing a subbase soil to allow for drainage of water off of the liner. Approximately 350 cubic yards of soil would be required to grade the area to drain by creating a high spot in the middle and sloping downward toward the edges.

A small anchor trench would then be dug along the perimeter of the area for drainage purposes. The HDPE liner would be placed in the anchor trench and backfilled with the previously excavated soils. The area should be proofrolled and inspected to make sure no stones or sharp objects are present which would damage the liner. Finally, sand bags would be placed on the

liner to prevent it from blowing away. According to the manufacturer, the Permalon liner is UV resistant, and would be expected to be functional over an 8 year period, assuming surface access was restricted.

Of the alternatives presented, this approach would provide the best protection against rainfall percolation and it is the lowest cost. Disadvantages of this alternative include the potential for weather to affect the liner, the care required during installation and afterward to avoid puncturing the liner, maintenance of sand bags, and its low aesthetic appeal.

3.2.2 Alternative 2: Geosynthetic Clay Liner with Geocomposite Drainage Net

This alternative includes grading the storage area and placing subbase soil to allow for drainage along the geocomposite drainage net. Approximately 350 cubic yards of soil would be placed in order to grade the area to drain by creating a high spot in the middle and sloping downward toward the edges. A geosynthetic clay liner (GCL) (with a typical permeability value of 5×10^{-9} cm/sec) such as Claymax, Bentomat, or Gundseal would then be placed over the subbase area.

A geocomposite drainage net consisting of a geotextile heatbonded to a geonet would be placed over the GCL to facilitate drainage away from the area. Lastly, a 1 foot thick protective cover consisting of a fine aggregate would be placed over the geocomposite drainage net.

The advantages of this approach over the others are its relative ease of installation, the fact that weather will not adversely affect the cover, and its minimal maintenance requirements. This is, however, the most expensive option.

3.2.3 Alternative 3: Clay Soil Fill with Geocomposite Drainage Net

This alternative includes placing and compacting a clay soil fill over the storage area. The clay soil fill would be 24 inches high in the middle and would slope down to a height of 18 inches at the sides. Approximately 550 cubic yards of material would be required for this soil fill. A geocomposite drainage net consisting of geotextile heatbonded to a geonet would be placed over the clay soil fill to facilitate drainage away from the area. Lastly, a 1 foot thick protective cover consisting of fine aggregate would be placed over the geocomposite drainage net. This approach

will have an approximate permeability value range of 1×10^{-5} to 1×10^{-7} cm/sec. It should be noted that this range is dependent upon field compaction requirements.

This alternative would be the easiest to install and would require minimal maintenance. Clay soil will, however, become more permeable with each freeze/thaw cycle. This method would be the least effective against rainfall percolation and most susceptible to freeze/thaw.

3.3 Groundwater Monitoring Program

The Phase IV shallow soil investigation detected localized areas of contamination beneath the Former Drum Storage Area. Specifically, elevated levels of EB and ST were concentrated along the length of the process sewer line buried beneath the assessment area (8 feet below grade). The deepest sample collected during the investigation was in Geoprobe® boring 53C from the 9 to 11-foot depth interval. All of the shallow soil sampling was performed within the unsaturated zone. Increasing moisture however was noted in a few samples that were collected at depths below 7 feet.

Based on the Phase IV soil analytical results, there is a potential that the detected contaminants could potentially migrate downward to the water table surface. To monitor this condition, DEI recommends the installation of shallow monitoring wells for sampling to monitor groundwater conditions downgradient of the Former Drum Storage Area.

Limited hydrogeologic information is available for the Dow Hanging Rock Plant area. A Phase I Preliminary Hydrological Review was completed by Earth Sciences for the Dow site in January, 1988 (Earth Sciences, 1988). This report indicates that the plant is located on a terrace in the Ohio River floodplain. The general site stratigraphy consists of a continuous surface clay and silt layer that extends to approximately 8 to 20 feet below grade. An unconsolidated, coarse sand and gravel deposit with an average thickness of 60 feet occurs beneath the surficial clay and silt cover. Pennsylvanian-age shale bedrock is encountered beneath the sand and gravel layer.

The sand and gravel layer is a principal aquifer for the surrounding area and supplies process water for Dow plant operations. The groundwater table is estimated to be 20 to 25 feet below grade and is believed to flow in a southwesterly direction toward the Ohio River. Recharge to the aquifer is presumed to be from the Ohio River.

Five production wells are installed at the Dow Hanging Rock Plant site. It is speculated that a sixth well may also exist onsite along the east side of Gilruth Lane. The five well locations and the possible sixth well location are shown on Figure 13. Recent communication with Dow Hanging Rock personnel has indicated that one of the plant wells (Dow-1) has been sealed and abandoned. At this moment, few details are available on the plant wells. The active wells (Dow-2, Dow-3, Dow-4, and Dow-5) are intermittently operated, however the pumping rates, water volumes, and well screen intervals are unknown. The active wells are located south of the Former Drum Storage Area. Under natural gradient conditions, groundwater entering the northeastern portion of the Former Drum Storage Area should flow in a southwesterly direction towards the Dow-5 well location. The groundwater flow regime may be altered during active pumping of the plant wells.

DEI has thoroughly reviewed the available chemical and hydrogeological data for the Former Drum Storage Area. Based on this review DEI recommends that the following steps be undertaken by Dow to assess and monitor groundwater conditions beneath the site area:

- Research plant records for information on physical data and status of the active plant wells.

- Obtain copies of well records containing pumping rates, water volumes, and times of operation.

- Drill and install three shallow monitoring wells for sampling downgradient of the Former Drum Storage Area.

- Perform single-well response tests to estimate hydraulic conductivity values of the sand and gravel aquifer.

The proposed monitoring wells will screen the upper portion of the sand and gravel aquifer between estimated depths of 20 to 30 feet below ground surface. The proposed wells will be strategically located in downgradient areas and are represented on Figure 14. These locations are tentative and are subject to change based on hydrogeologic conditions and other site constraints. Hydraulic characteristics of the sand and gravel aquifer will be ascertained by collecting water level measurements to determine the hydraulic gradient and groundwater flow

direction within the study area. Results from single-well response tests will be used to calculate groundwater flow velocity beneath the site area.

Groundwater sampling will be performed following well installation activities. The groundwater samples will be analyzed for indicator parameters (pH, specific conductance, temperature, TOC, TOX, etc.) and for the four known VOC constituents (EB, ST, MC, AN) that have impacted the overlying soils. Following the initial round of sampling and review of analytical results, a program for periodic monitoring will be developed. This monitoring will be conducted on an annual basis if analytical results from the initial sampling are found to be below U.S. EPA Maximum Contaminant Levels (MCLs) for drinking water. If concentrations exist above the MCLs, then semiannual monitoring will be conducted.

4.0 RECOMMENDATIONS

The Phase IV soil sampling reported herein indicates that elevated concentrations of ethylbenzene and styrene, as well as detectable concentrations of methylene chloride and acrylonitrile are present within and to the north of the Former Drum Storage Area. As discussed in Section 3.0, because the Former Drum Storage Area is adjacent to known SWMUs, including a process sewer line beneath the Area, DEI recommends that the migration minimization and monitoring program discussed above be implemented.

Of the three migration minimization alternatives evaluated, DEI recommends use of Alternative 2, the geosynthetic clay liner with geocomposite drainage net. Although all three alternatives are suitable for this application, Alternative 2 is the least susceptible to weathering, requires minimal maintenance, and will effectively minimize rainfall percolation. Based on these advantages, it is felt that Alternative 2 is the preferred alternative, regardless of the fact that it is the most expensive.

Following installation of the cover, a limited hydrologic investigation is also recommended. As discussed above, this would involve installation of three shallow monitoring wells following review of plant records on the active production wells. The study would include single-well response tests to estimate hydraulic conductivity. Groundwater sampling performed following well installation will be used to monitor the potential for offsite migration of groundwater that may be impacted by the overlying soils of the Former Drum Storage Area.

5.0 SCHEDULE

Following approval of the management plan included herein, installation of the geosynthetic cover and initiation of the groundwater monitoring program would follow the schedule shown below.

Activity	Weeks Following Approval
Cover installation Review of plant well records	Weeks 1 and 2
Install monitoring wells, perform single-well response tests, initiate groundwater monitoring	Weeks 3 and 4

6.0 REFERENCES

AWD Technologies, Inc., 1993. Closure Plan Modification, Old Drum Storage Area, Hanging Rock Plant, Ironton, Ohio, Project Number 7015-500, September.

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Ohio Environmental Protection Agency, 1993c. Closure Plan Review Guidance for RCRA Facilities, Interim Final, September 1.

Porter, Wright, Morris & Arthur, 1995. Letter to Ms. Katherine M. Anderson, The Dow Chemical Company, from Mr. Martin S. Seltzer, January 6.

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U.S. Environmental Protection Agency, 1983. Methods for Chemical Analysis of Water and Wastes, Environmental Monitoring and Support Laboratory, Office of Research and Development, Cincinnati, Ohio, March.

TABLES

TABLE 1

SUMMARY OF SOIL SAMPLING LOCATIONS AND DEPTHS[a]

Location[b]	Depth Interval (feet below grade)								
	0-2	1-3	2-4	3-5	4-6	5-7	6-8	7-9	9-11
8A					X				
8B	X		X[c]		X		O		
8C	X		X		X		O		
8D	X		X		X		O		
11A			X		X				
16A			X						
17B		X							
17C		X							
19A			X						
20A					X				
20B	X		X		X		X		
20C	X		X		X		X		
20D	X		X		X		X		
21B		X							
22B		X							
22C		O							
23B		X							
23C		X							
23D		O							
43B	X								
43C	X								
46A			X		X				
48A			X						
49A			X[c]		X				

C:\WP51\DOW\IRONTON\950111\950111.TB1 SLK01/17/95

TABLE 1

SUMMARY OF SOIL SAMPLING LOCATIONS AND DEPTHS[a]

Location[b]	Depth Interval (feet below grade)								
	0-2	1-3	2-4	3-5	4-6	5-7	6-8	7-9	9-11
51A			X[c]		X[c]				
52A			X						
53A			X						
53B		X		X		X[c]		X[c]	
53C		X		X		X		X	X
53D		X		X		X		X	
54A			X		X				
54B		X		X		X		O	
54C		X		X		X		O	
54D		O		O		O		O	
55A			X						
BG-1	X		X		X		X		
BG-2	X		X		X		X		
BG-3	X		X		X		X		

(a) "X" indicates that the sample was collected and analyzed for acrylonitrile, styrene, methylene chloride, ethylbenzene, and barium.

"O" indicates that the sample was collected but analysis was not needed to obtain three decreasing points of concentration.

(b) Locations are indicated on Figure 5.

(c) This sample was offset for resampling.

TABLE 2

SUMMARY OF QA/QC SAMPLE ANALYSIS
PAGE 1 OF 2

Location	Depth Interval (ft)	Analysis Method (SW-846)[a]	Sample Type			
			Duplicate	Matrix Spike	Matrix Spike Duplicate	Blank
16A	2 - 4	8240A/6010A		X		
19A	2 - 4	8240A	X			
20A	4 - 6	8240A	X			
20A	4 - 6	8240A/6010A		X	X	
20A	4 - 6	6010A	X			
20B	2 - 4	8240A	X			
20C	0 - 2	8240A/6010A	X			
20C	0 - 2	8240A	X			
20C	0 - 2	8240A/6010A		X	X	
20C	2 - 4	8240A/6010A		X		
21B	1 - 3	6010A	X			
22B	1 - 3	6010A	X			
22B	1 - 3	8240A	X			
22B	1 - 3	8240A/6010A		X	X	

TABLE 2

SUMMARY OF QA/QC SAMPLE ANALYSIS
PAGE 2 OF 2

Location	Depth Interval (ft)	Analysis Method (SW-846)[a]	Sample Type			
			Duplicate	Matrix Spike	Matrix Spike Duplicate	Blank
23C	1 - 3	8240A/6010A	X			
43B	0 - 2	8240A/6010A	X			
53C	1 - 3	8240A/6010A	X			
54C	1 - 3	8240A	X			
54C	1 - 3	6010A	X			
54C	1 - 3	8240A/6010A		X	X	
Field Blank	NA	8240A				X
Trip Blank	NA	8240A/6010A/3005A				X
Totals:			14	6	4	2

[a] 8240A: Volatile Organics by Gas Chromatography/Mass Spectrometry
6010A: Inductively Coupled Plasma - Atomic Emission Spectroscopy
3005A: Acid Digestion of Waters for Total Recoverable or Dissolved Metals for Analysis by Flame Atomic Absorption (FAA) or Inductively Coupled Plasma (ICP) Spectroscopy

h [b]	Analyte [c]	8A	8B	8C	8D	11A	16A	B	53C	53D	54A	54B	54C	55A	BG-1	BG-2	BG-3
1	EB	--	<6	<6	<6	--	--	-	--	--	--	--	--	--	--	--	--
	AN	--	<120	<110	<120	--	--	-	--	--	--	--	--	--	--	--	--
	ST	--	<6	<6	<6	--	--	-	--	--	--	--	--	--	--	--	--
	MC	--	<6	<6	<6	--	--	-	--	--	--	--	--	--	--	--	--
	Ba	--	73	157	80	--	--	-	--	--	--	--	--	--	77	87	100
2	EB	--	--	--	--	--	--	76	30[d]	10	--	<6	<6	--	--	--	--
	AN	--	--	--	--	--	--	<120	<120	<120	--	<120	<120	--	--	--	--
	ST	--	--	--	--	--	--	88	74[d]	<6	--	<6	<6	--	--	--	--
	MC	--	--	--	--	--	--	<6	<6	<6	--	<6	<6	--	--	--	--
	Ba	--	--	--	--	--	--	66	82	79	--	63	76	--	--	--	--
3	EB	--	200	<6	<6	8	<6	--	--	--	<6	--	--	<6	--	--	--
	AN	--	<120	<120	<120	<120	<120	--	--	--	<120	--	--	<120	--	--	--
	ST	--	<6	<6	<6	17	<6	--	--	--	<6	--	--	<6	--	--	--
	MC	--	<6	<6	<6	<6	<6	--	--	--	<6	--	--	<6	--	--	--
	Ba	--	153	124	106	67	101	--	--	--	63	--	--	72	66	87	79
4	EB	--	--	--	--	--	--	33	160	120	--	<6	<6	--	--	--	--
	AN	--	--	--	--	--	--	<120	<120	<120	--	<120	<120	--	--	--	--
	ST	--	--	--	--	--	--	38	280	63	--	<6	<6	--	--	--	--
	MC	--	--	--	--	--	--	<6	<6	<6	--	<6	<6	--	--	--	--
	Ba	--	--	--	--	--	--	56	83	85	--	83	79	--	--	--	--
5	EB	<6	<6	<6	<6	570,000[d]	--	--	--	--	<6	--	--	--	--	--	--
	AN	<120	<130	<130	<130	<540,000	--	--	--	--	<120	--	--	--	--	--	--
	ST	<6	1,500[d]	<6	<6	530,000[d]	--	--	--	--	<6	--	--	--	--	--	--
	MC	<6	<6	<6	<6	<27,000	--	--	--	--	<6	--	--	--	--	--	--
	Ba	130	121	105	138	73	--	--	--	--	98	--	--	--	116	118	116
5	EB	--	--	--	--	--	--	00,000[d]	400	260	--	<6	<6	--	--	--	--
	AN	--	--	--	--	--	--	670,000	<120	270	--	<120	<120	--	--	--	--
	ST	--	--	--	--	--	--	50,000[d]	540	300	--	<6	<6	--	--	--	--
	MC	--	--	--	--	--	--	<33,000	<6	18	--	9	<6	--	--	--	--
	Ba	--	--	--	--	--	--	89	313	125	--	118	132	--	--	--	--
7	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	AN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	ST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Ba	--	--	--	--	--	--	--	--	--	--	--	--	--	154	170	151
8	EB	--	--	--	--	--	--	10,000[d]	520,000	870	--	--	--	--	--	--	--
	AN	--	--	--	--	--	--	<160,000	<160,000	190	--	--	--	--	--	--	--
	ST	--	--	--	--	--	--	81,000[d]	200,000	490	--	--	--	--	--	--	--
	MC	--	--	--	--	--	--	<7,900	<7,900	40	--	--	--	--	--	--	--
	Ba	--	--	--	--	--	--	117	160	129	--	--	--	--	--	--	--
10	EB	--	--	--	--	--	--	--	170,000	--	--	--	--	--	--	--	--
	AN	--	--	--	--	--	--	--	<170,000	--	--	--	--	--	--	--	--
	ST	--	--	--	--	--	--	--	54,000	--	--	--	--	--	--	--	--
	MC	--	--	--	--	--	--	--	<8,100	--	--	--	--	--	--	--	--
	Ba	--	--	--	--	--	--	--	129	--	--	--	--	--	--	--	--

[a] Non-detected analytes are reported as the limit of quantitation, "- -" in
[b] Midpoint of the 2-foot sample interval - depth below surface.
[c] "EB" = ethylbenzene, "AN" = acrylonitrile, "ST" = styrene, "MC" = m
[d] Data qualified as "J." Analyte is present but concentration is estimate
[e] Data qualified as "UJ" analyte was not detected, but reported quantita

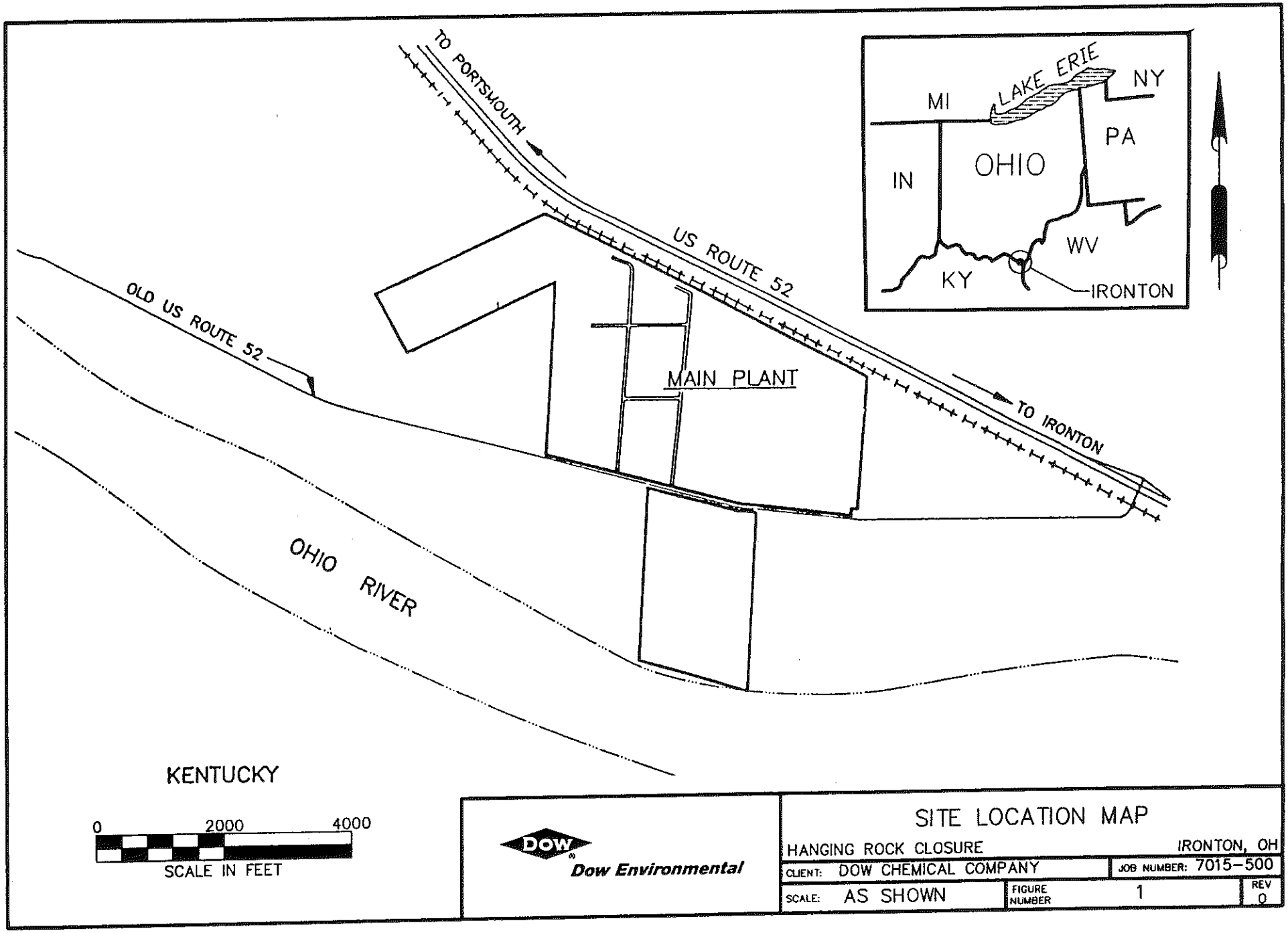
TABLE 4

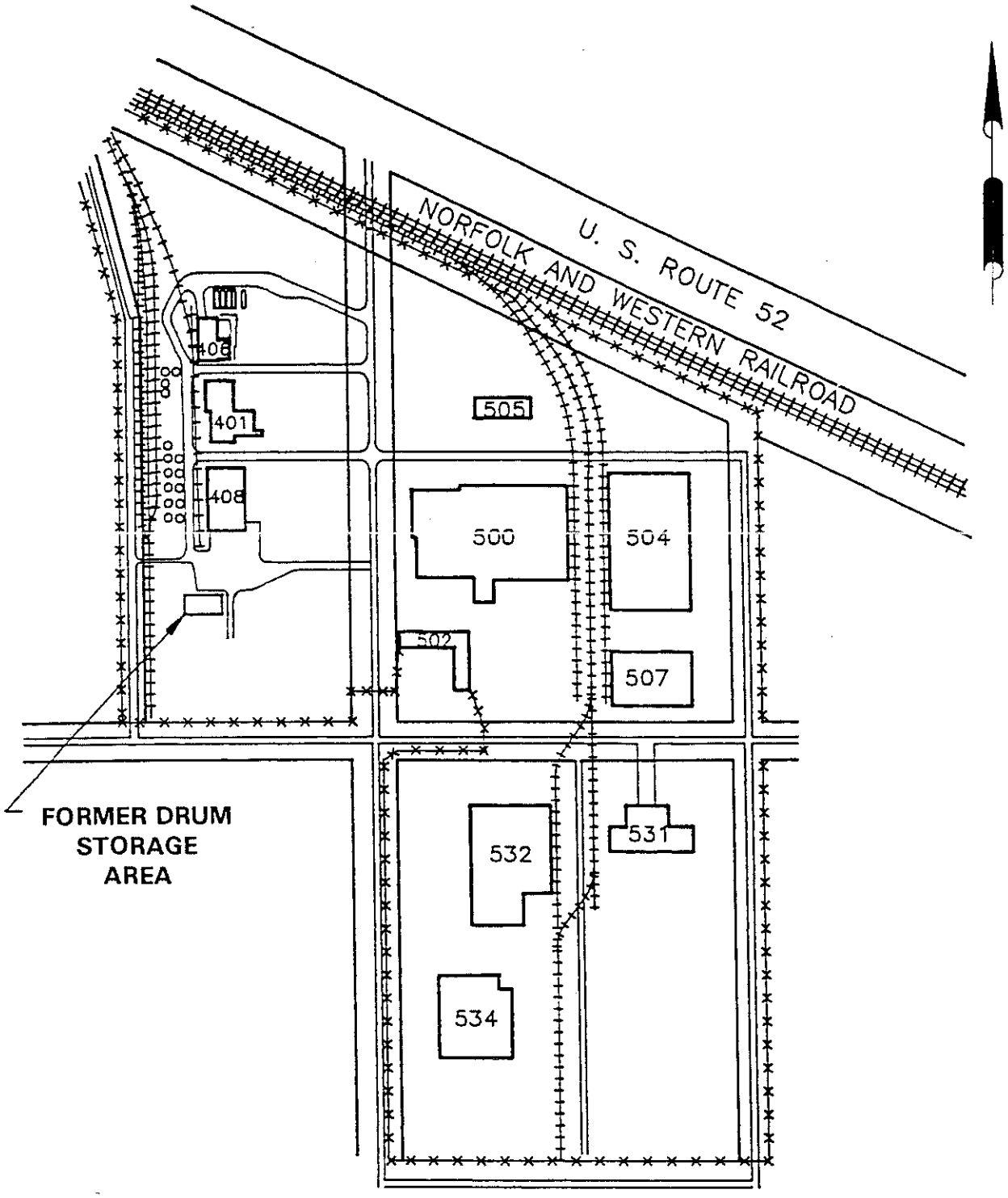
SUMMARY OF BACKGROUND BARIUM CONCENTRATIONS AND DERIVATION OF SITE-SPECIFIC ACTION LEVEL

Sample No.	Depth Interval (ft)	Barium Concentration	
		(mg/kg)	ln (mg/kg)
BG-1	0 - 2	77	4.3438
BG-1	2 - 4	66	4.1897
BG-1	4 - 6	116	4.7536
BG-1	6 - 8	154	5.037
BG-2	0 - 2	87	4.4659
BG-2	2 - 4	87	4.4659
BG-2	4 - 6	118	4.7707
BG-2	6 - 8	170	5.1358
BG-3	0 - 2	100	4.6052
BG-3	2 - 4	79	4.3694
BG-3	4 - 6	116	4.7536
BG-3	6 - 8	151	5.0173
			Mean = 4.6590
			Standard Deviation = 0.3030

Upper Compliance Level (Action Level) = Mean + 2 (standard deviation)
= 4.659 + 2 (0.303)
= 5.265 (ln mg/kg)
= 193.4 mg/kg

FIGURES


TO PORTSMOUTH
US ROUTE 52
OLD US ROUTE 52
MAIN PLANT
TO IRONTON
OHIO RIVER
KENTUCKY
LAKE ERIE
MI
NY
PA
OHIO
IN
WV
KY
IRONTON
0
2000
4000
SCALE IN FEET
DOW
Dow Environmental
SITE LOCATION MAP
HANGING ROCK CLOSURE
IRONTON, OH
CLIENT: DOW CHEMICAL COMPANY
JOB NUMBER: 7015-500
SCALE: AS SHOWN
FIGURE NUMBER 1
REV 0



0 400 800
SCALE IN FEET

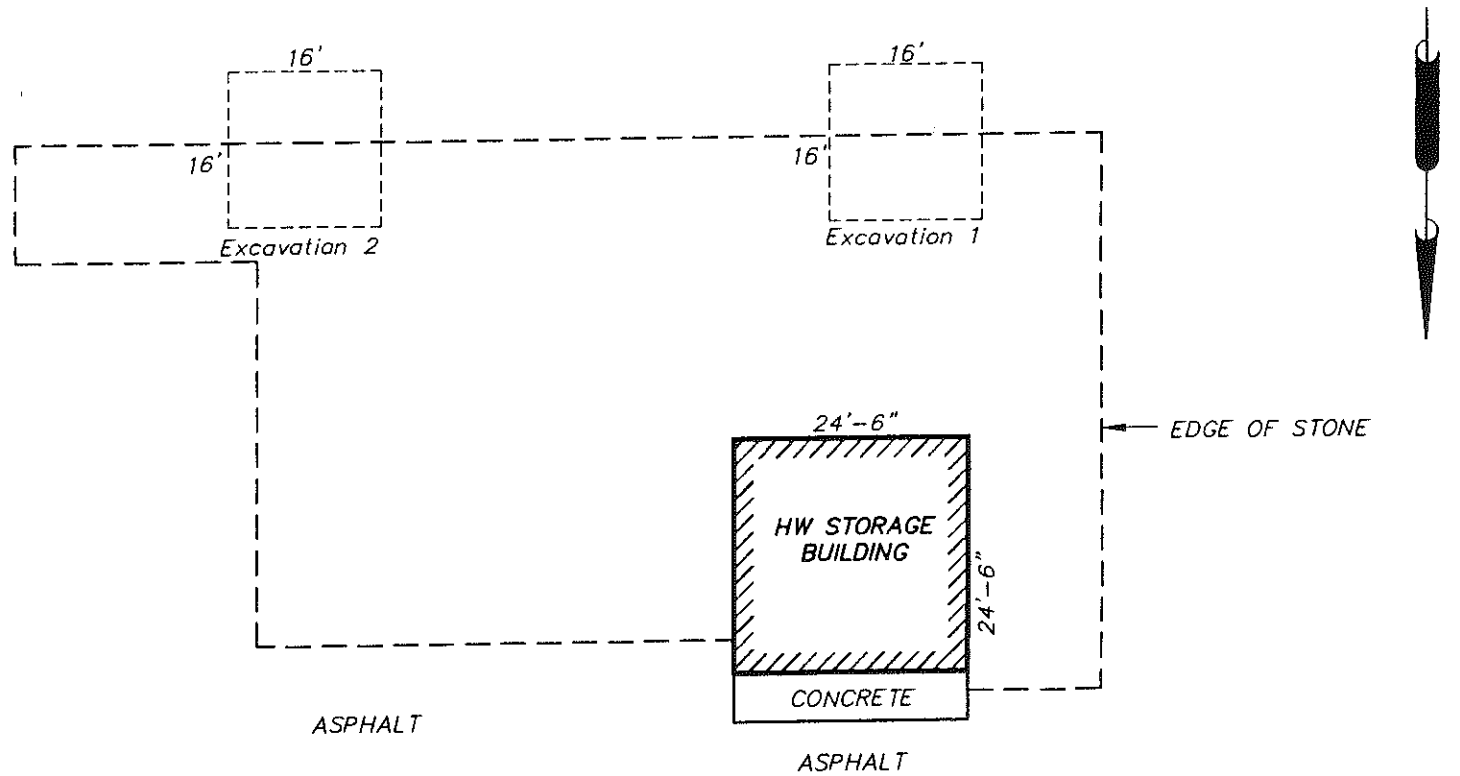
NOTE: ONLY MAIN FEATURES ARE SHOWN ON THIS PLAN.

Dow Environmental

FACILITY PLAN

HANGING ROCK CLOSURE			IRONTON, OH
CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER:	7015-500
SCALE: AS SHOWN	FIGURE NUMBER 2		REV 0

FILE: \DOW\HANGROCK\SITE-LOC



LEGEND

— — — APPROXIMATE EXTENT OF DRUM STORAGE AREA

REFERENCE

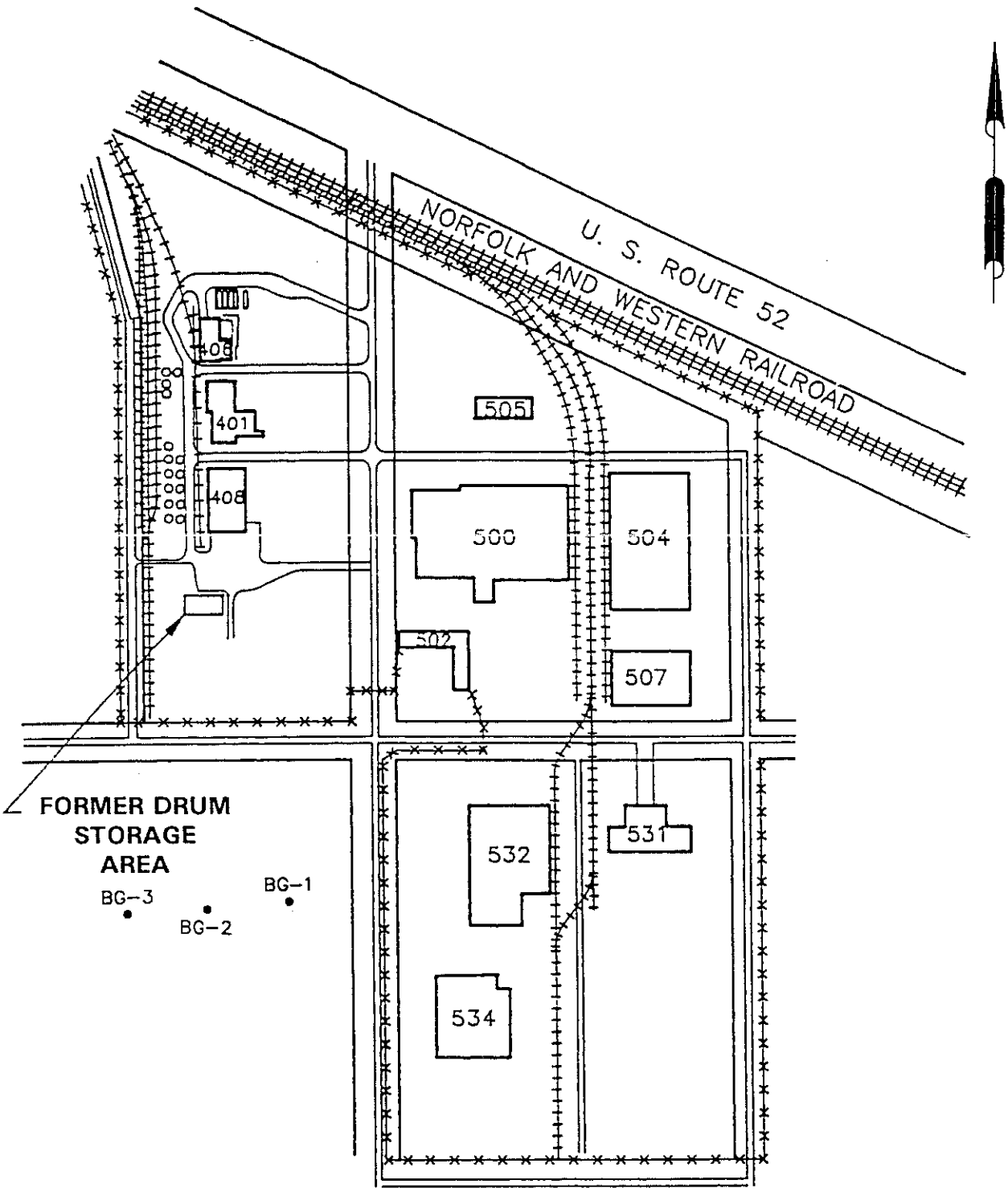
BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

0 20 40
SCALE IN FEET

0 0
2 1
0 1
3 0
9 9
5 5
R K
T G
H

Dow
Dow Environmental

SITE LOCATION		
HANGING ROCK CLOSURE		IRONTON, OH
CLIENT: DOW CHEMICAL COMPANY	JOB NUMBER: 7015-500	
SCALE: AS SHOWN	FIGURE NUMBER 3	REV 0



0 400 800
SCALE IN FEET

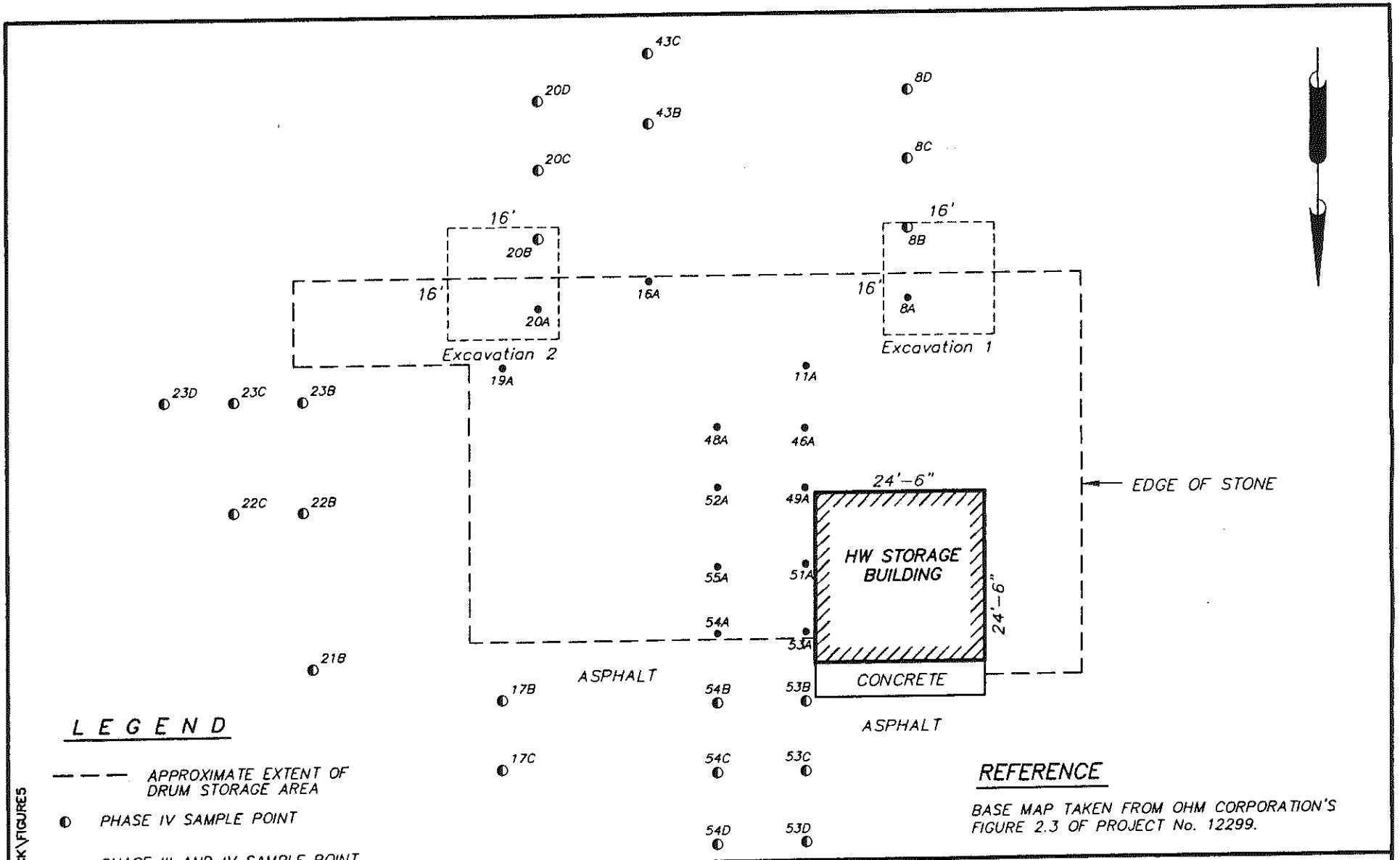
NOTE: ONLY MAIN FEATURES ARE SHOWN ON THIS PLAN.

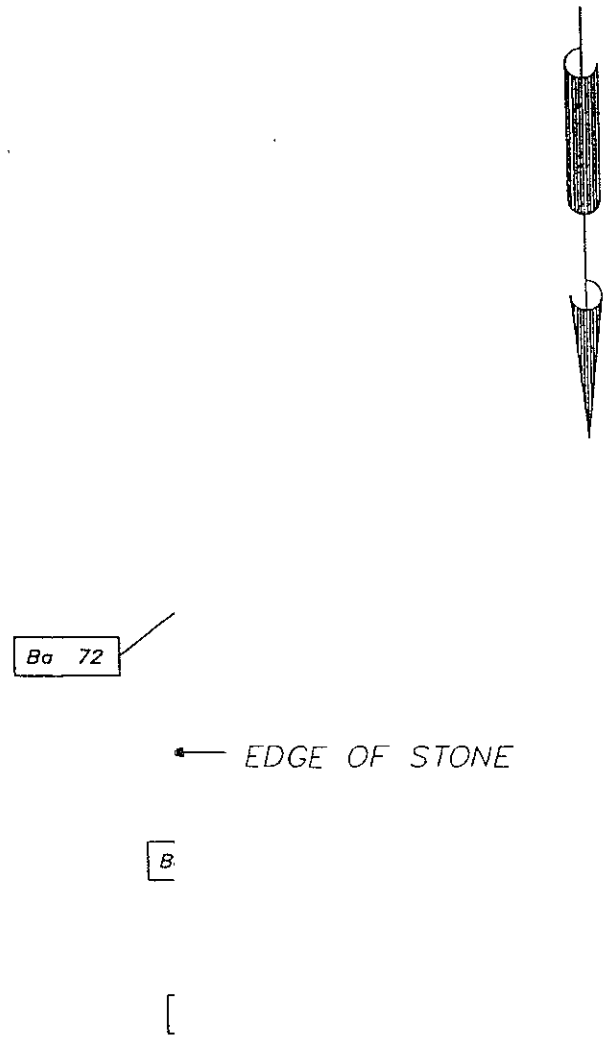
Dow Environmental

BACKGROUND SAMPLE LOCATIONS

HANGING ROCK CLOSURE — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-500	
SCALE: AS SHOWN	FIGURE NUMBER 4		REV 0


43C
20D
43B
20C
8D
8C
16'
20B
16'
20A
16A
16'
8B
16'
8A
Excavation 2
Excavation 1
19A
11A
23D
23C
23B
48A
46A
24'-6"
EDGE OF STONE
22C
22B
52A
49A
HW STORAGE BUILDING
55A
51A
24'-6"
54A
53A
21B
ASPHALT
CONCRETE
17B
54B
53B
ASPHALT
17C
54C
53C
54D
53D
LEGEND
APPROXIMATE EXTENT OF DRUM STORAGE AREA
PHASE IV SAMPLE POINT
PHASE III AND IV SAMPLE POINT
0
20
40
SCALE IN FEET
REFERENCE
BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.
FILE: \DOW\HANGROCK\FIGURE5
0 0
2 1
0 7
3 9
9 5
R R
T T
H H
Dow
Dow Environmental
PHASE IV SAMPLE LOCATIONS
HANGING ROCK CLOSURE
IRONTON, OH
CLIENT: DOW CHEMICAL COMPANY
JOB NUMBER: 7015-500
SCALE: AS SHOWN
FIGURE NUMBER 5
REV 0



LEGEND

— — — APPROXIMATE EXTENT O
DRUM STORAGE AREA

PHASE IV SAMPLE POINT COLL

PHASE IV SAMPLE POINT COLL

KEY TO ABBREVIATIONS

AN ACRYLONITRILE
Ba BARIUM
EB ETHYLBENZENE
MC METHYLENE CHLORIDE
ST STYRENE

NOTE: CONCENTRATIONS GIVEN IN
EXCEPT FOR BARIUM, GIVEN

REFERENCE

ASE MAP TAKEN FROM OHM CORPORATION'S
IGURE 2.3 OF PROJECT No. 12299.

IV SOIL SAMPLING RESULTS
) 3 FEET BELOW GRADE

E IRONTON, OH

COMPANY	JOB NUMBER: 7015-500	
FIGURE NUMBER 6		REV 0

0 15
SCALE IN FE

FILE: \DOW\HANGROCK\FIGURE6

EDGE OF STONE

LEGEND

— — — APPROXIMATE EXTENT (
DRUM STORAGE AREA

PHASE IV SAMPLE POINT COL

PHASE IV SAMPLE POINT COL

KEY TO ABBREVIATIONS

EB ETHYLBENZENE
AN ACRYLONITRILE
ST STYRENE
MC METHYLENE CHLORIDE
BA BARIUM

NOTE: CONCENTRATIONS GIVEN IN
EXCEPT FOR BARIUM, GIVEN

FERENCE

: MAP TAKEN FROM OHM CORPORATION'S
RE 2.3 OF PROJECT No. 12299.

IV SOIL SAMPLING RESULTS
) 5 FEET BELOW GRADE

RE IRONTON, OH

0 15
SCALE IN FEET

COMPANY

JOB NUMBER: 7015-500

FIGURE NUMBER 7

REV 0

FILE: \DOW\HANGROCK\FIGURE7

EDGE OF STONE

LEGEND

APPROXIMATE EXTENT (
DRUM STORAGE AREA

PHASE IV SAMPLE POINT COL

PHASE IV SAMPLE POINT COL

KEY TO ABBREVIATIONS

EB ETHYLBENZENE
AN ACRYLONITRILE
ST STYRENE
MC METHYLENE CHLORIDE
BA BARIUM

NOTE: CONCENTRATIONS GIVEN IN
EXCEPT FOR BARIUM, GIVEN

FERENCE

E MAP TAKEN FROM OHM CORPORATION'S
IRE 2.3 OF PROJECT No. 12299.

V SOIL SAMPLING RESULTS
) 7 FEET BELOW GRADE

E IRONTON, OH

0 15
SCALE IN F

COMPANY

JOB NUMBER: 7015-500

FIGURE NUMBER 8

REV 0

FILE: \DOW\HANGROCK\FIGUREB

TABLE 3
DOW HANGING ROCK - SUMMARY OF PHASE IV SOIL SAMPLING (10/20/94 - 10/22/94)

h	Analyte[c]	Dry Weight Concentration (ug/kg) [except for barium (mg/kg)] at Sample Location[a]																																	
		8A	8B	8C	8D	11A	16A	17B	17C	19A	20A	20B	20C	20D	21B	22B	23B	23C	43B	43C	46A	48A	49A	51A	52A	53A	53B	53C	53D	54A	54B	54C	55A	BG-1	BG-2	BG-3
1	EB	--	<6	<6	<6	--	--	--	--	--	--	7	<6	<6	--	--	--	--	9	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	AN	--	<120	<110	<120	--	--	--	--	--	--	<120	<110	<110	--	--	--	--	<110	<110	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	ST	--	<6	<6	<6	--	--	--	--	--	--	<6	<6	<6	--	--	--	--	<6	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MC	--	<6	<6	<6	--	--	--	--	--	--	<6	7	<6	--	--	--	--	<6	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Ba	--	73	157	80	--	--	--	--	--	--	69	64	95	--	--	--	--	78	101	--	--	--	--	--	--	--	--	--	--	--	--	--	77	87	100
2	EB	--	--	--	--	--	--	<6	<6	--	--	--	--	--	<6	<6	<6	<6	--	--	--	--	--	--	--	--	76	30[d]	10	--	<6	<6	--	--	--	--
	AN	--	--	--	--	--	--	<120	<120	--	--	--	--	--	<120	<120	<120	<120	--	--	--	--	--	--	--	--	<120	<120	<120	--	<120	<120	--	--	--	--
	ST	--	--	--	--	--	--	<6	<6	--	--	--	--	--	<6	<6	<6	<6	--	--	--	--	--	--	--	--	88	74[d]	<6	--	<6	<6	--	--	--	--
	MC	--	--	--	--	--	--	<6	<6	--	--	--	--	--	<6	<6	<6	<6	--	--	--	--	--	--	--	--	<6	<6	<6	--	<6	<6	--	--	--	--
	Ba	--	--	--	--	--	--	58	61	--	--	--	--	--	49	61	74	72	--	--	--	--	--	--	--	--	66	82	79	--	63	76	--	--	--	--
3	EB	--	200	<6	<6	8	<6	--	--	<6	--	<6	<6	<6	--	--	--	--	--	--	23	<6	550	17,000	<6	10	--	--	--	<6	--	--	<6	--	--	--
	AN	--	<120	<120	<120	<120	<120	--	--	<120	--	<120	<120	<120	--	--	--	--	--	--	<120	<120	<120	<16,000	<120	<120	--	--	--	<120	--	--	<120	--	--	--
	ST	--	<6	<6	<6	17	<6	--	--	<6	--	<6	<6	<6	--	--	--	--	--	--	14	<6	350	7,600	<6	<6	--	--	--	<6	--	--	<6	--	--	--
	MC	--	<6	<6	<6	<6	<6	--	--	<6	--	<6	<6	<6	--	--	--	--	--	--	<6	<6	<6	<760	<6	<6	--	--	--	<6	--	--	<6	--	--	--
	Ba	--	153	124	106	67	101	--	--	92	--	71	83	68	--	--	--	--	--	--	73	61	118	69	71	155	--	--	--	63	--	--	72	66	87	79
4	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	33	160	120	--	<6	<6	--	--	--	--
	AN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<120	<120	<120	--	<120	<120	--	--	--	--
	ST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	38	280	63	--	<6	<6	--	--	--	--
	MC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<6	<6	<6	--	<6	<6	--	--	--	--
	Ba	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	56	83	85	--	83	79	--	--	--	--
5	EB	<6	<6	<6	<6	570,000[d]	--	--	--	--	90	28	<6	<6	--	--	--	--	--	--	1,200	--	99,000	22,000[d]	--	2,200[d]	--	--	--	<6	--	--	--	--	--	--
	AN	<120	<130	<130	<130	<540,000	--	--	--	--	<120	<120	<120	<120	--	--	--	--	--	--	<120	--	<55,000	<16,000[e]	--	<620	--	--	--	<120	--	--	--	--	--	--
	ST	<6	1,500[d]	<6	<6	530,000[d]	--	--	--	--	57	47	<6	<6	--	--	--	--	--	--	320	--	60,000	12,000[d]	--	3,400[d]	--	--	--	<6	--	--	--	--	--	--
	MC	<6	<6	<6	<6	<27,000	--	--	--	--	<6	<6	<6	<6	--	--	--	--	--	--	<6	--	<2,700	<780[e]	--	<31	--	--	--	<6	--	--	--	--	--	--
	Ba	130	121	105	138	73	--	--	--	--	97	106	113	100	--	--	--	--	--	--	103	--	100	95	--	120	--	--	--	98	--	--	--	116	118	116
5	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1,400,000[d]	400	260	--	<6	<6	--	--	--	--
	AN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<670,000	<120	270	--	<120	<120	--	--	--	--
	ST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	950,000[d]	540	300	--	<6	<6	--	--	--	--
	MC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<33,000	<6	18	--	9	<6	--	--	--	--
	Ba	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	89	313	125	--	118	132	--	--	--	--
7	EB	--	--	--	--	--	--	--	--	--	--	27	<6	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	AN	--	--	--	--	--	--	--	--	--	--	<130	<120	<120	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	ST	--	--	--	--	--	--	--	--	--	--	53	<6	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MC	--	--	--	--	--	--	--	--	--	--	<6	<6	<6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Ba	--	--	--	--	--	--	--	--	--	--	120	144	108	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	154	170	151
8	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	210,000[d]	520,000	870	--	--	--	--	--	--	--
	AN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<160,000	<160,000	190	--	--	--	--	--	--	--
	ST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	81,000[d]	200,000	490	--	--	--	--	--	--	--
	MC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<7,900	<7,900	40	--	--	--	--	--	--	--
	Ba	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	117	160	129	--	--	--	--	--	--	--
10	EB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	170,000	--	--	--	--	--	--	--	--
	AN	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<170,000	--	--	--	--	--	--	--	--
	ST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54,000	--	--	--	--	--	--	--	--
	MC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<8,100	--	--	--	--	--	--	--	--
	Ba	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	129	--	--	--	--	--	--	--	--

(a) Non-detected analytes are reported as the limit of quantitation, "--" indicates "oot sampled."
(b) Midpoint of the 2-foot sample interval - depth below surface.
(c) "EB" = ethylbenzene, "AN" = acrylonitrile, "ST" = styrene, "MC" = methylene chloride, "Ba" = barium.
(d) Data qualified as "J." Analyte is present but concentration is estimated.
(e) Data qualified as "UJ" analyte was not detected, but reported quantitation limit is estimated.

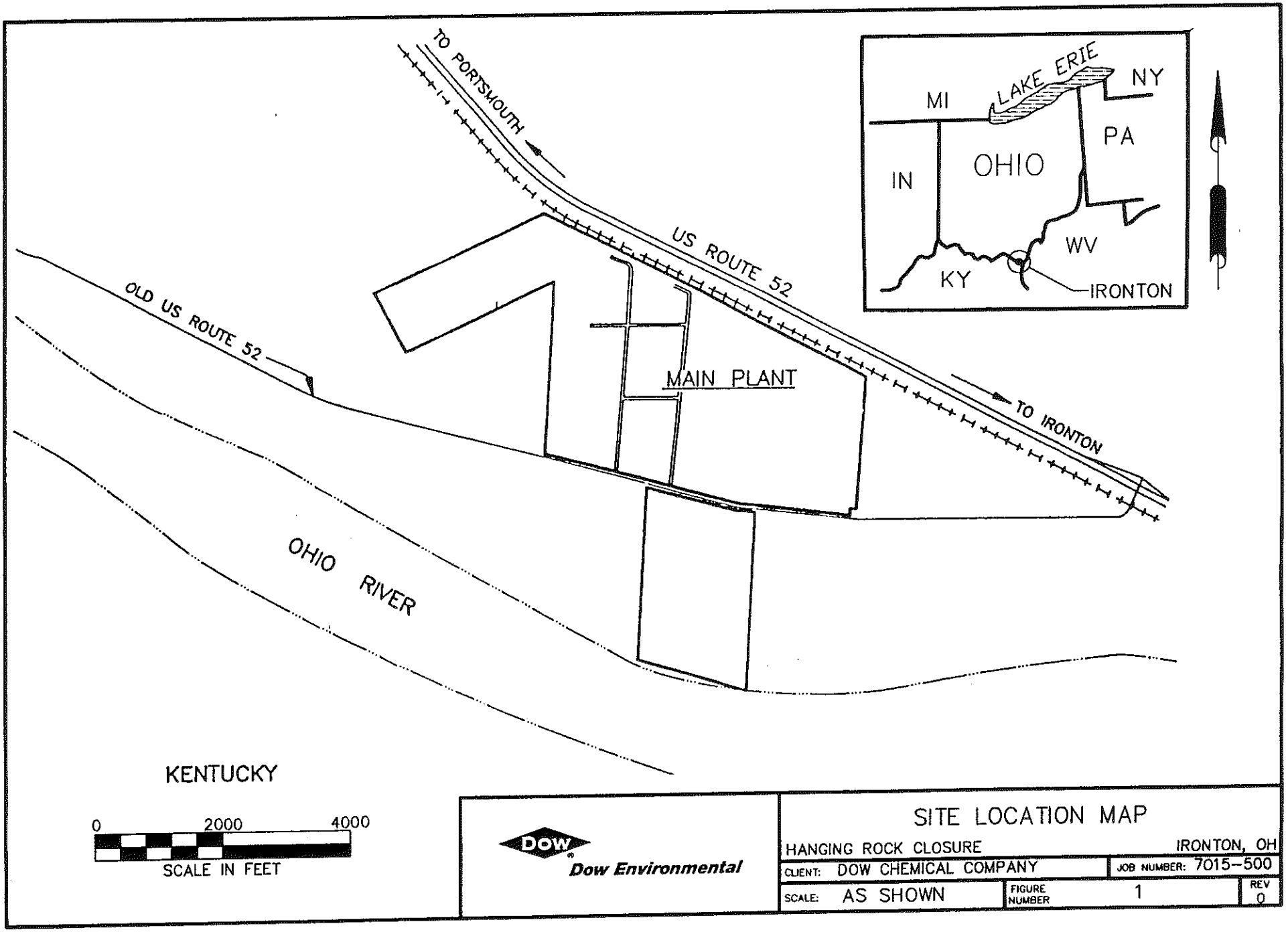
TABLE 4

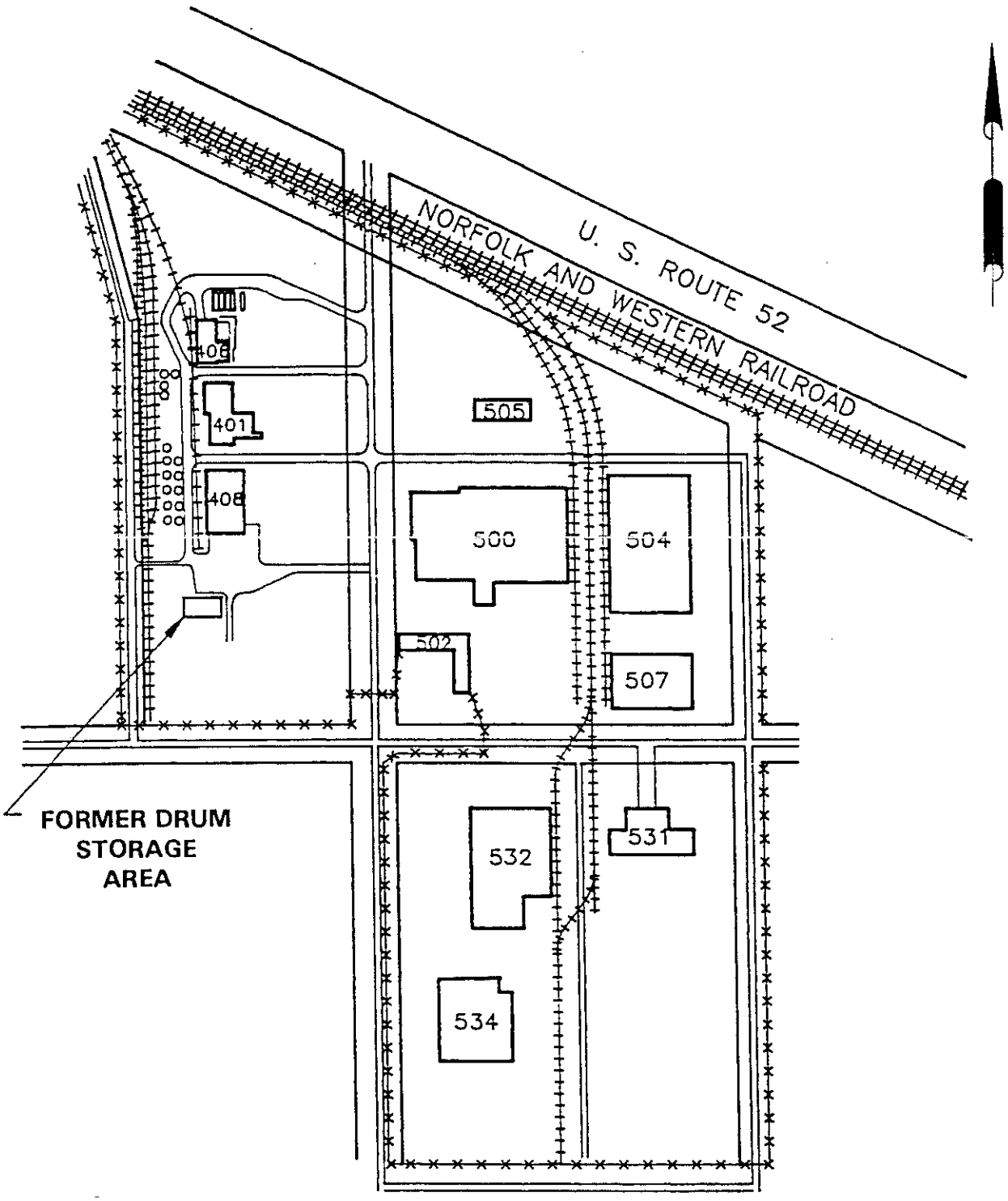
SUMMARY OF BACKGROUND BARIUM CONCENTRATIONS AND DERIVATION OF SITE-SPECIFIC ACTION LEVEL

Sample No.	Depth Interval (ft)	Barium Concentration	
		(mg/kg)	ln (mg/kg)
BG-1	0 - 2	77	4.3438
BG-1	2 - 4	66	4.1897
BG-1	4 - 6	116	4.7536
BG-1	6 - 8	154	5.037
BG-2	0 - 2	87	4.4659
BG-2	2 - 4	87	4.4659
BG-2	4 - 6	118	4.7707
BG-2	6 - 8	170	5.1358
BG-3	0 - 2	100	4.6052
BG-3	2 - 4	79	4.3694
BG-3	4 - 6	116	4.7536
BG-3	6 - 8	151	5.0173
			Mean = 4.6590
			Standard Deviation = 0.3030

Upper Compliance Level (Action Level) = Mean + 2 (standard deviation)
= 4.659 + 2 (0.303)
= 5.265 (ln mg/kg)
= 193.4 mg/kg

FIGURES


TO PORTSMOUTH
US ROUTE 52
OLD US ROUTE 52
MAIN PLANT
TO IRONTON
OHIO RIVER
KENTUCKY
LAKE ERIE
MI
NY
PA
IN
OHIO
WV
KY
IRONTON
0
2000
4000
SCALE IN FEET
DOW
Dow Environmental
SITE LOCATION MAP
HANGING ROCK CLOSURE
IRONTON, OH
CLIENT: DOW CHEMICAL COMPANY
JOB NUMBER: 7015-500
SCALE: AS SHOWN
FIGURE NUMBER 1
REV 0



0 400 800
SCALE IN FEET

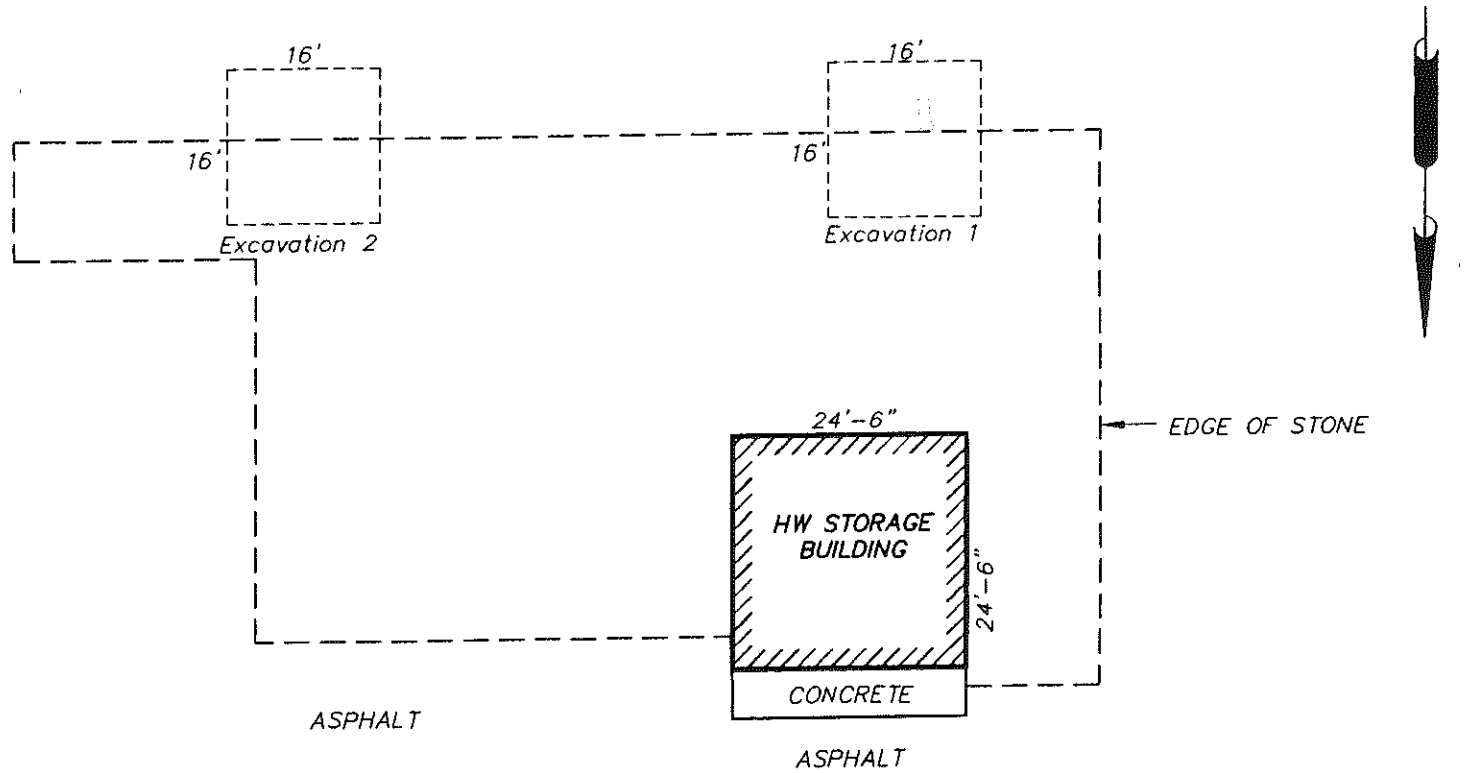
NOTE: ONLY MAIN FEATURES ARE SHOWN ON THIS PLAN.

Dow Environmental

FACILITY PLAN

HANGING ROCK CLOSURE			IRONTON, OH
CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER:	7015-500
SCALE: AS SHOWN	FIGURE NUMBER 2		REV 0

FILE: \DOW\HANGROCK\SITE-LOC



LEGEND

— — — APPROXIMATE EXTENT OF DRUM STORAGE AREA

REFERENCE

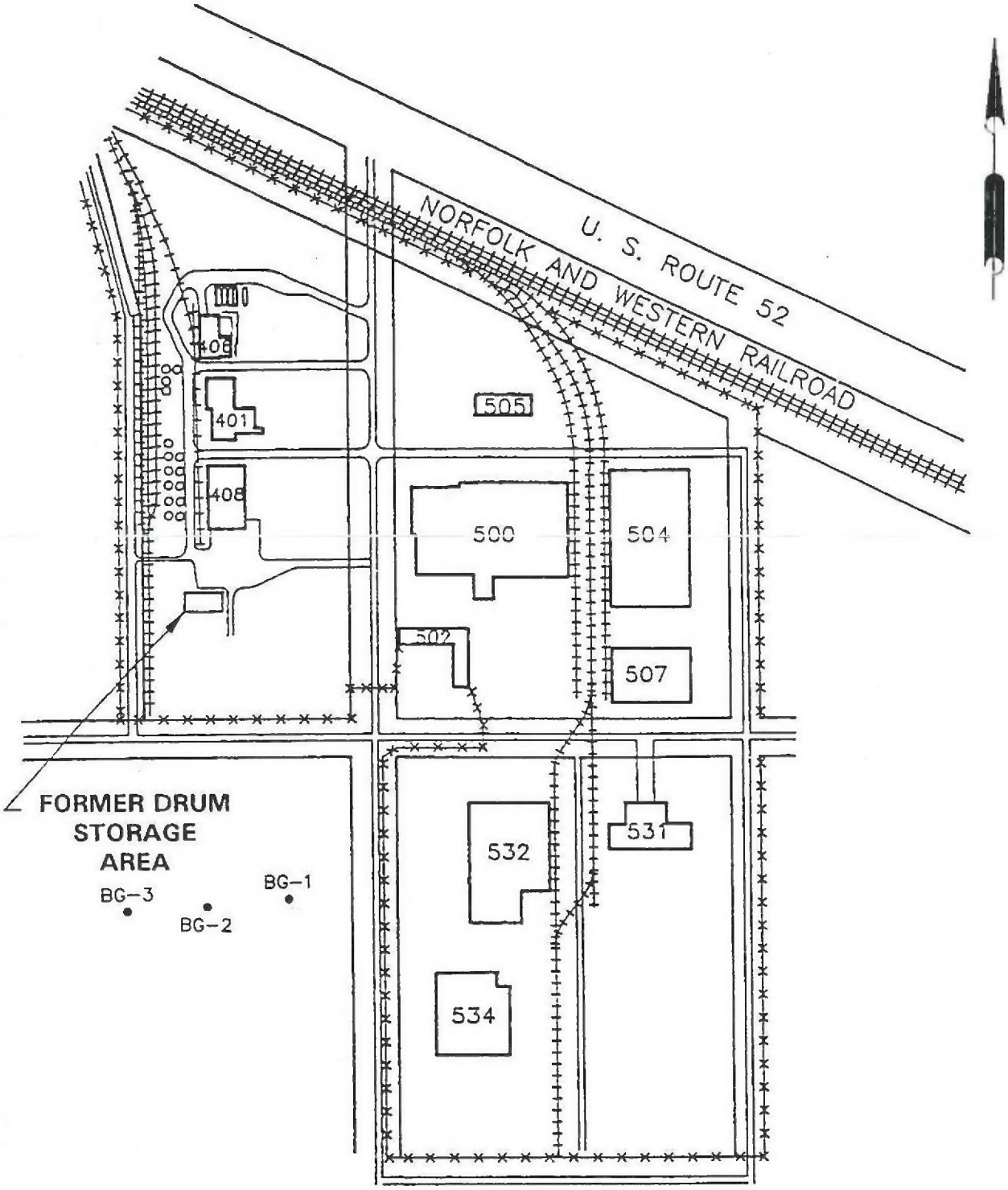
BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

0 20 40
SCALE IN FEET

0 0
2 1
0 1
3 0
9 9
5 5
R K
T G
H

DOW
Dow Environmental

SITE LOCATION			
HANGING ROCK CLOSURE		IRONTON, OH	
CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-500	
SCALE: AS SHOWN	FIGURE NUMBER 3		REV 0



0 400 800
SCALE IN FEET

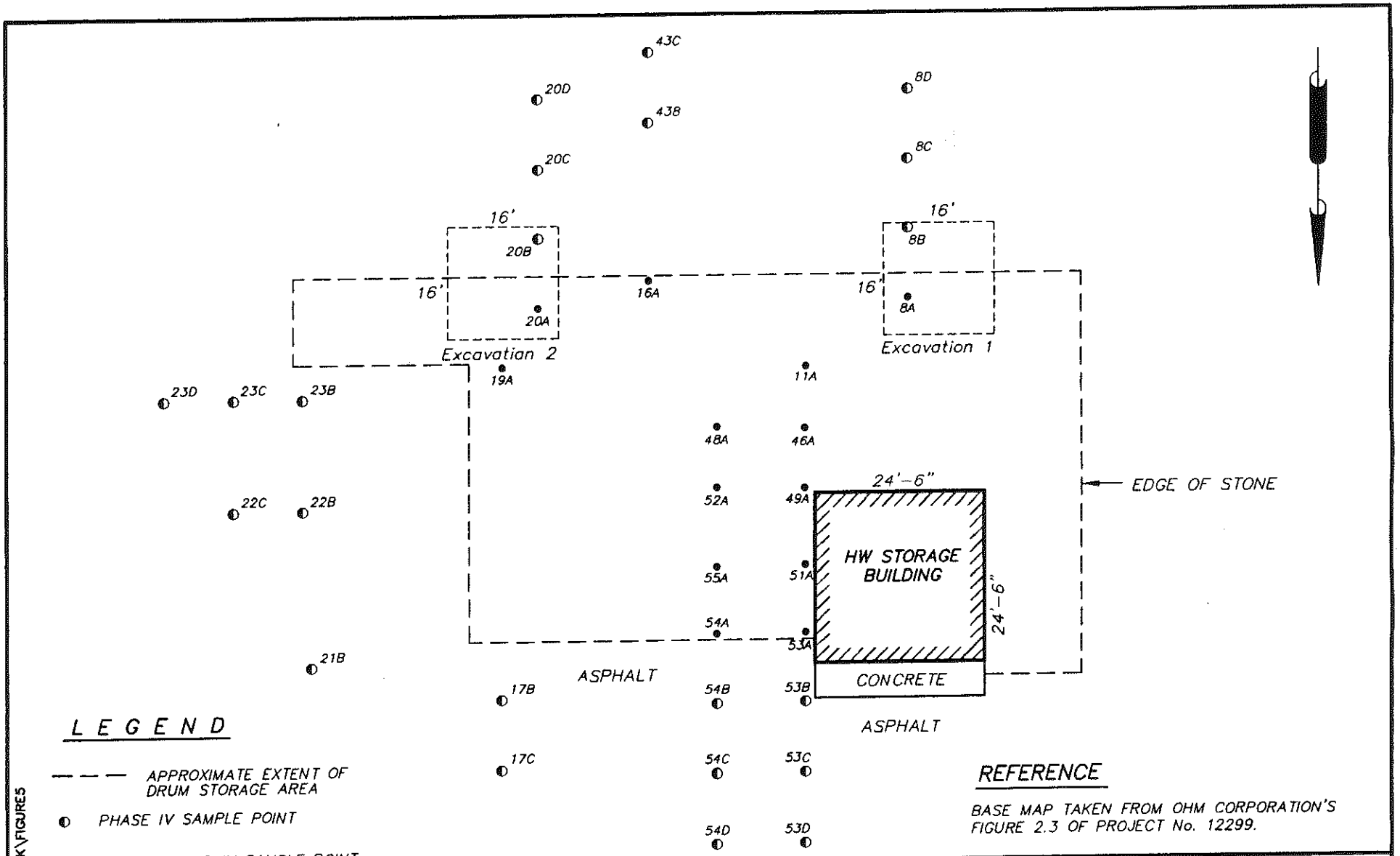
NOTE: ONLY MAIN FEATURES ARE SHOWN ON THIS PLAN.

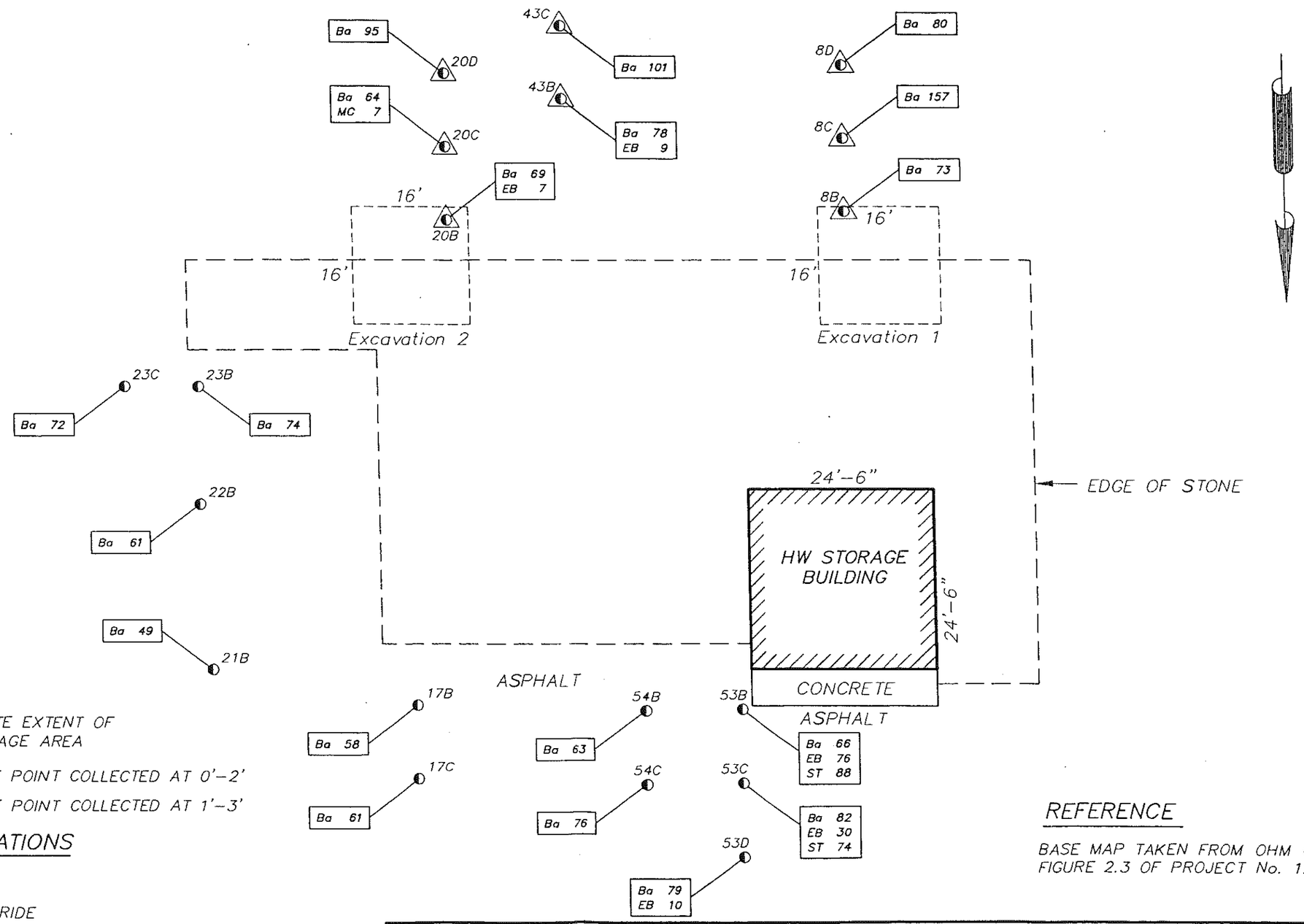
Dow Environmental

BACKGROUND SAMPLE LOCATIONS

HANGING ROCK CLOSURE — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-500	
SCALE: AS SHOWN	FIGURE NUMBER 4		REV 0


43C
20D
43B
20C
8D
8C
16'
20B
16'
20A
16A
16'
8B
16'
8A
Excavation 2
Excavation 1
19A
11A
23D
23C
23B
48A
46A
22C
22B
52A
49A
24'-6"
EDGE OF STONE
HW STORAGE BUILDING
55A
51A
24'-6"
54A
53A
21B
ASPHALT
CONCRETE
17B
54B
53B
ASPHALT
17C
54C
53C
54D
53D
LEGEND
APPROXIMATE EXTENT OF DRUM STORAGE AREA
PHASE IV SAMPLE POINT
PHASE III AND IV SAMPLE POINT
0
20
40
SCALE IN FEET
REFERENCE
BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.
FILE: \DOW\HANGROCK\FIGURE5
DOW
Dow Environmental
PHASE IV SAMPLE LOCATIONS
HANGING ROCK CLOSURE
IRONTON, OH
CLIENT: DOW CHEMICAL COMPANY
JOB NUMBER: 7015-500
SCALE: AS SHOWN
FIGURE NUMBER 5
REV 0



LEGEND

— — — APPROXIMATE EXTENT OF DRUM STORAGE AREA

PHASE IV SAMPLE POINT COLLECTED AT 0'–2'

PHASE IV SAMPLE POINT COLLECTED AT 1'–3'

KEY TO ABBREVIATIONS

AN ACRYLONITRILE
Ba BARIUM
EB ETHYLBENZENE
MC METHYLENE CHLORIDE
ST STYRENE

NOTE: CONCENTRATIONS GIVEN IN µg/kg EXCEPT FOR BARIUM, GIVEN IN mg/kg.

0 15 30
SCALE IN FEET

REFERENCE

BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

FILE: \DOW\HANGROCK\FIGURE6

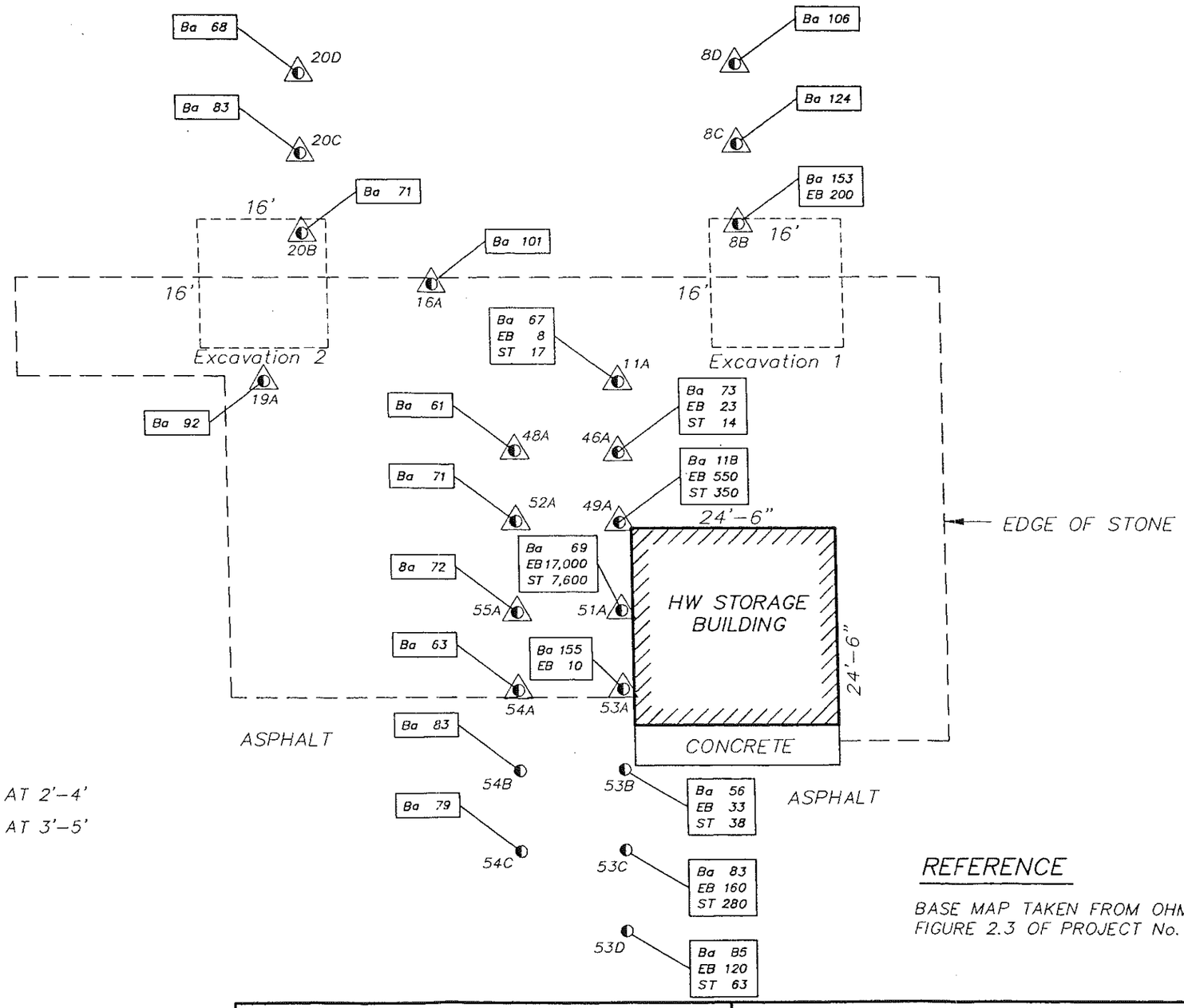
0 0 2 1 0 3 0 9 9 5 5 R K T G H

DOW®
Dow Environmental

PHASE IV SOIL SAMPLING RESULTS 0 TO 3 FEET BELOW GRADE

HANGING ROCK CLOSURE — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015–500	
SCALE: AS SHOWN	FIGURE NUMBER 6		REV 0



LEGEND

— — — APPROXIMATE EXTENT OF DRUM STORAGE AREA

PHASE IV SAMPLE POINT COLLECTED AT 2'–4'

PHASE IV SAMPLE POINT COLLECTED AT 3'–5'

KEY TO ABBREVIATIONS

EB ETHYLBENZENE
AN ACRYLONITRILE
ST STYRENE
MC METHYLENE CHLORIDE
BA BARIUM

NOTE: CONCENTRATIONS GIVEN IN μg/kg EXCEPT FOR BARIUM, GIVEN IN mg/kg.

0 15 30
SCALE IN FEET

REFERENCE

BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

FILE: \DOW\HANGROCK\FIGURE7

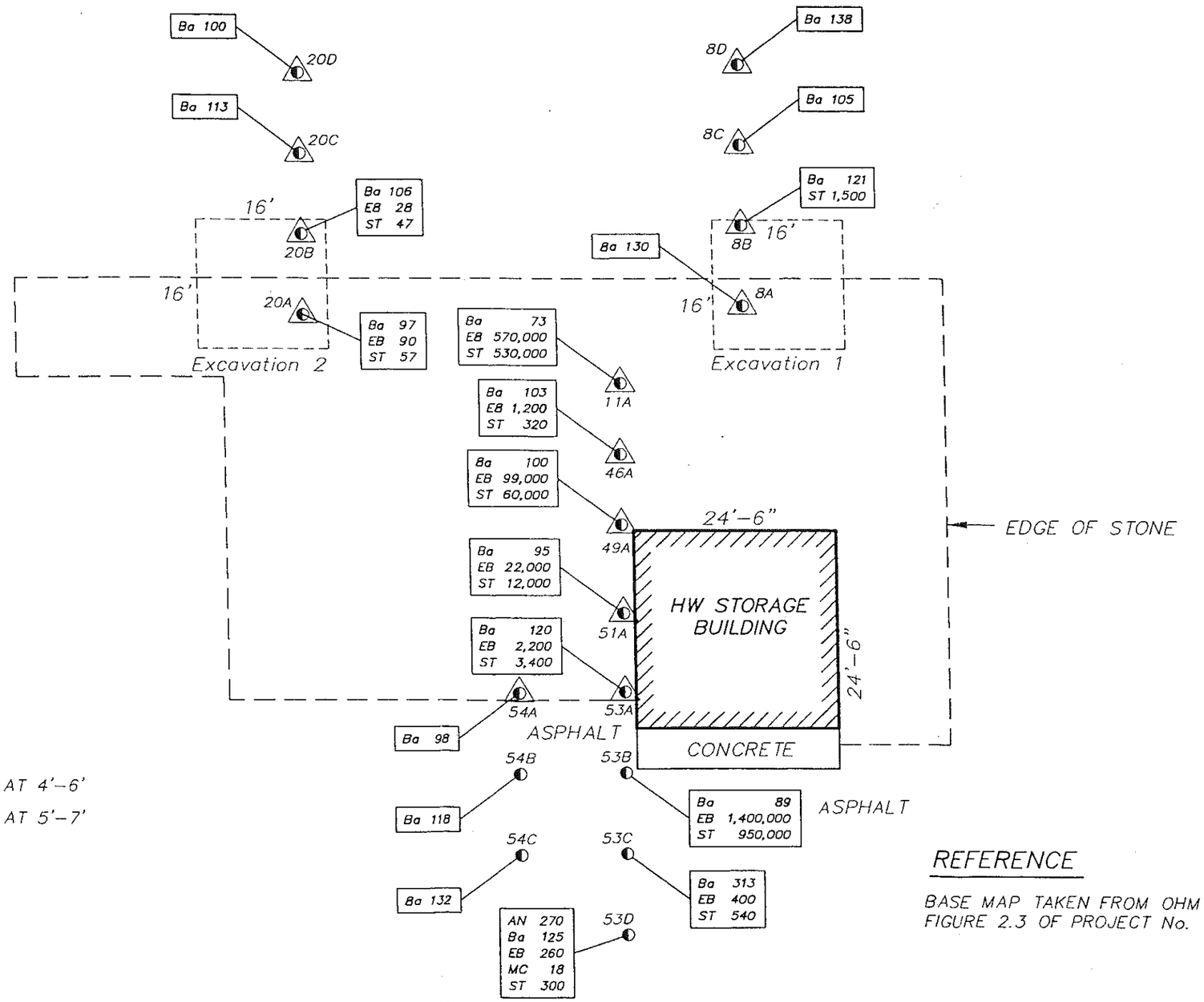
0021030995RKTGH

Dow Environmental

PHASE IV SOIL SAMPLING RESULTS 2 TO 5 FEET BELOW GRADE

HANGING ROCK CLOSURE — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015–500	
SCALE: AS SHOWN	FIGURE NUMBER 7		REV 0



LEGEND

— — — APPROXIMATE EXTENT OF DRUM STORAGE AREA

PHASE IV SAMPLE POINT COLLECTED AT 4'-6'

PHASE IV SAMPLE POINT COLLECTED AT 5'-7'

KEY TO ABBREVIATIONS

EB ETHYLBENZENE
AN ACRYLONITRILE
ST STYRENE
MC METHYLENE CHLORIDE
BA BARIUM

NOTE: CONCENTRATIONS GIVEN IN µg/kg EXCEPT FOR BARIUM, GIVEN IN mg/kg.

0 15 30
SCALE IN FEET

REFERENCE

BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

FILE: \DOW\HANGROCK\FIGURE8

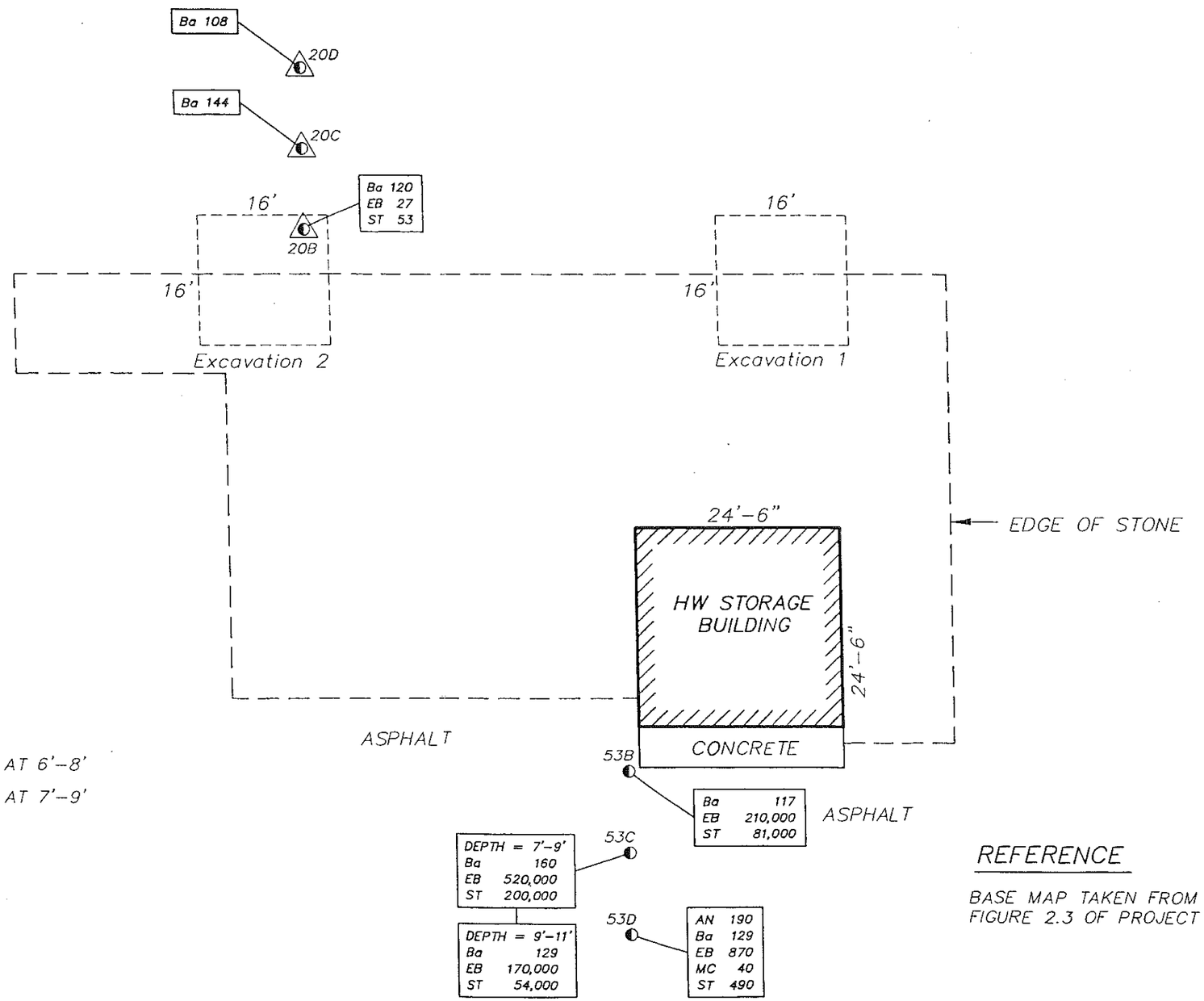
0 0 2 1 0 1 3 0 9 9 5 5 R K T G H

DOW®
Dow Environmental

PHASE IV SOIL SAMPLING RESULTS 4 TO 7 FEET BELOW GRADE

HANGING ROCK CLOSURE — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-500	
SCALE: AS SHOWN	FIGURE NUMBER 8		REV 0



LEGEND

— — — APPROXIMATE EXTENT OF DRUM STORAGE AREA

PHASE IV SAMPLE POINT COLLECTED AT 6'-8'

PHASE IV SAMPLE POINT COLLECTED AT 7'-9'

KEY TO ABBREVIATIONS

EB ETHYLBENZENE
AN ACRYLONITRILE
ST STYRENE
MC METHYLENE CHLORIDE
BA BARIUM

NOTE: CONCENTRATIONS GIVEN IN µg/kg EXCEPT FOR BARIUM, GIVEN IN mg/kg.

0 15 30
SCALE IN FEET

REFERENCE

BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

FILE: \DOW\HANGROCK\FIGURE9

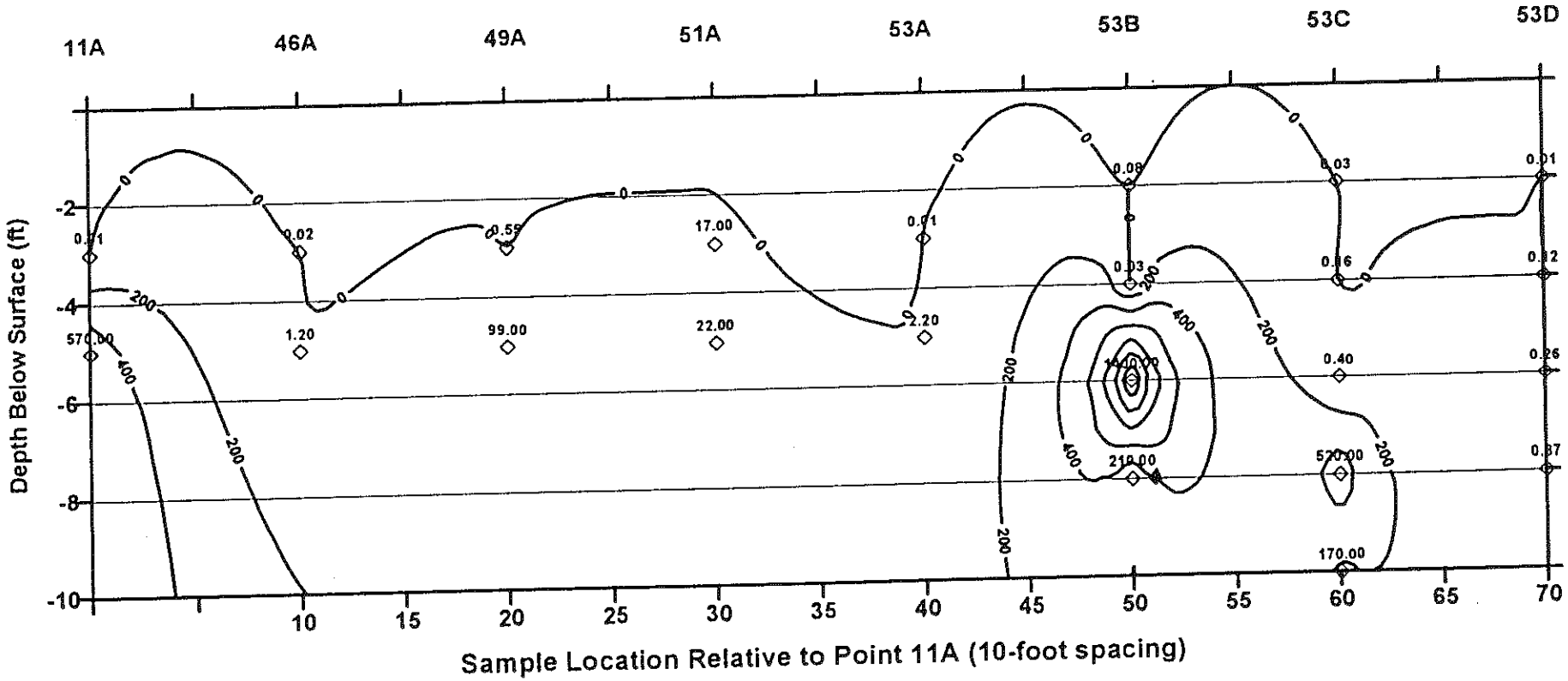
0 0 2 1 0 3 0 9 9 5 5 R K T G H

DOW®
Dow Environmental

PHASE IV SOIL SAMPLING RESULTS 6 TO 11 FEET BELOW GRADE

HANGING ROCK CLOSURE — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-500	
SCALE: AS SHOWN	FIGURE NUMBER 9		REV 0



NOTE: THIS FIGURE REPRESENTS PHASE IV SAMPLING CONDUCTED FROM 10/20/94 TO 10/22/94. CONTOUR INTERVAL IS 200mg/kg.

FILE: \DOW\HANGROCK\FIGURE10

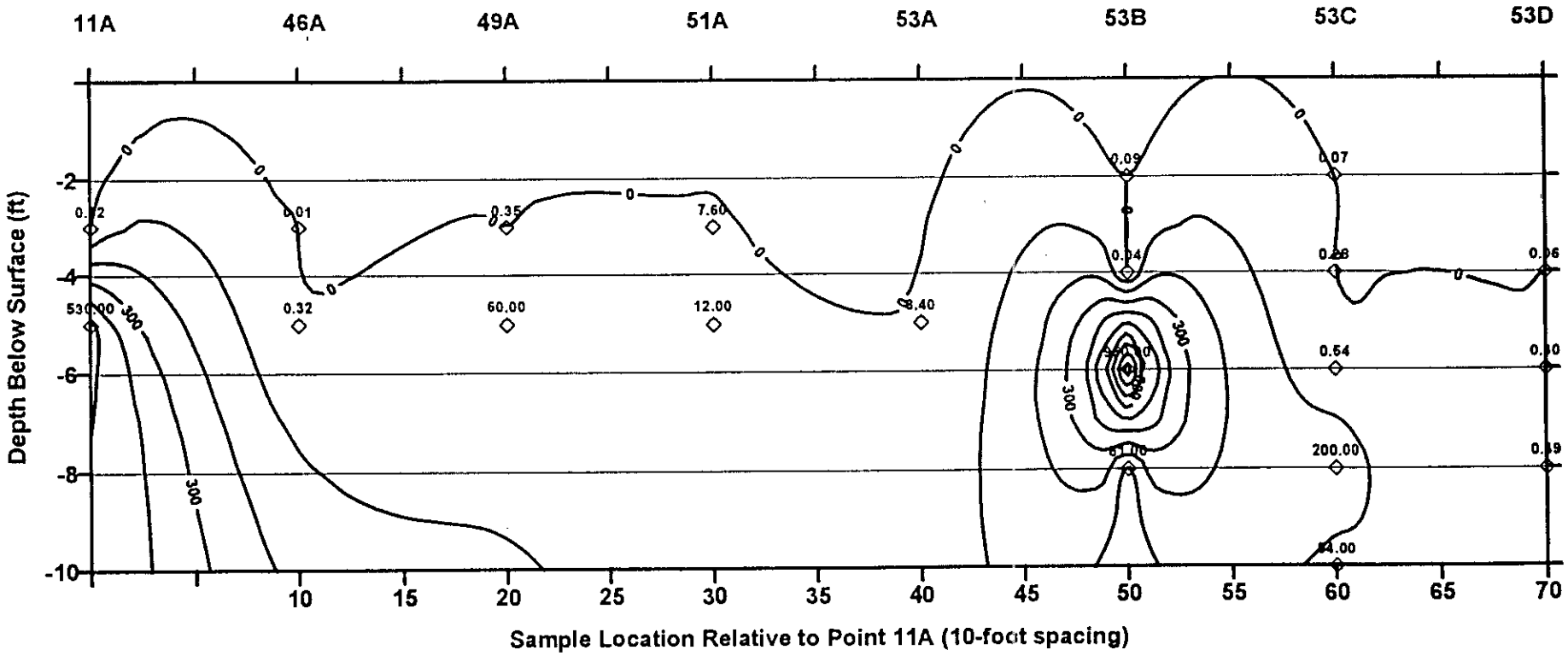
011795RTH

Dow Environmental

VERTICAL PROFILE OF ETHYLBENZENE CONCENTRATIONS IN SOIL (mg/kg)

HANGING ROCK – OLD DRUM STORAGE AREA IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-500	
SCALE: NONE	FIGURE NUMBER 10		REV 0



NOTE: THIS FIGURE REPRESENTS PHASE IV SAMPLING CONDUCTED FROM 10/20/94 TO 10/22/94. CONTOUR INTERVAL IS 100mg/kg.

FILE: \DOW\HANGROCK\FIGURE11

0117951RTH

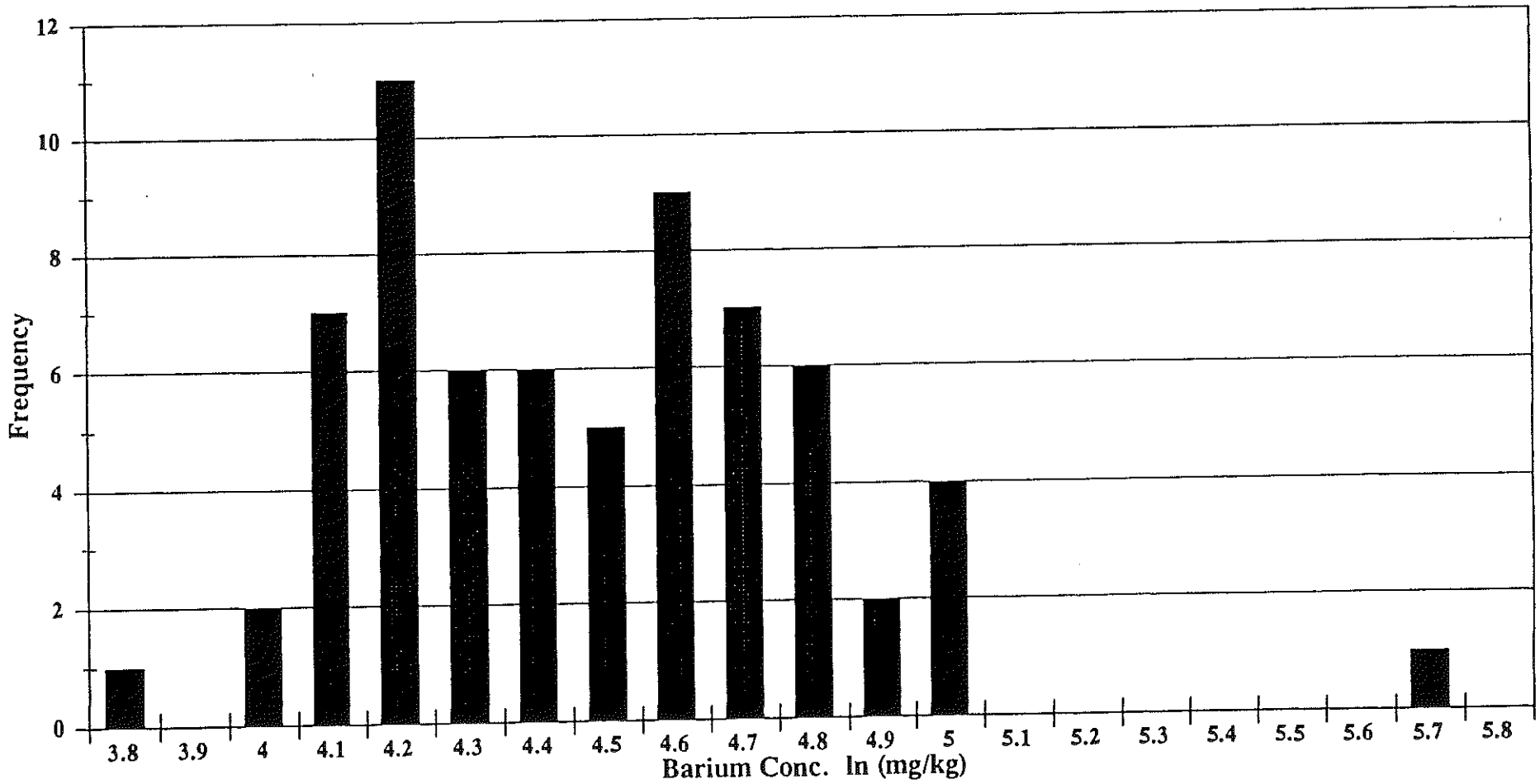
DOW

Dow Environmental

VERTICAL PROFILE OF STYRENE CONCENTRATIONS IN SOIL (mg/kg)

HANGING ROCK – OLD DRUM STORAGE AREA IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-500	
SCALE: NONE	FIGURE NUMBER 11		REV 0



NOTE: THIS FIGURE REPRESENTS PHASE IV SAMPLING CONDUCTED FROM 10/20/94 TO 10/22/94. CONTOUR INTERVAL IS 100mg/kg.

FILE: \DOW\HANGROCK\FIGURE12

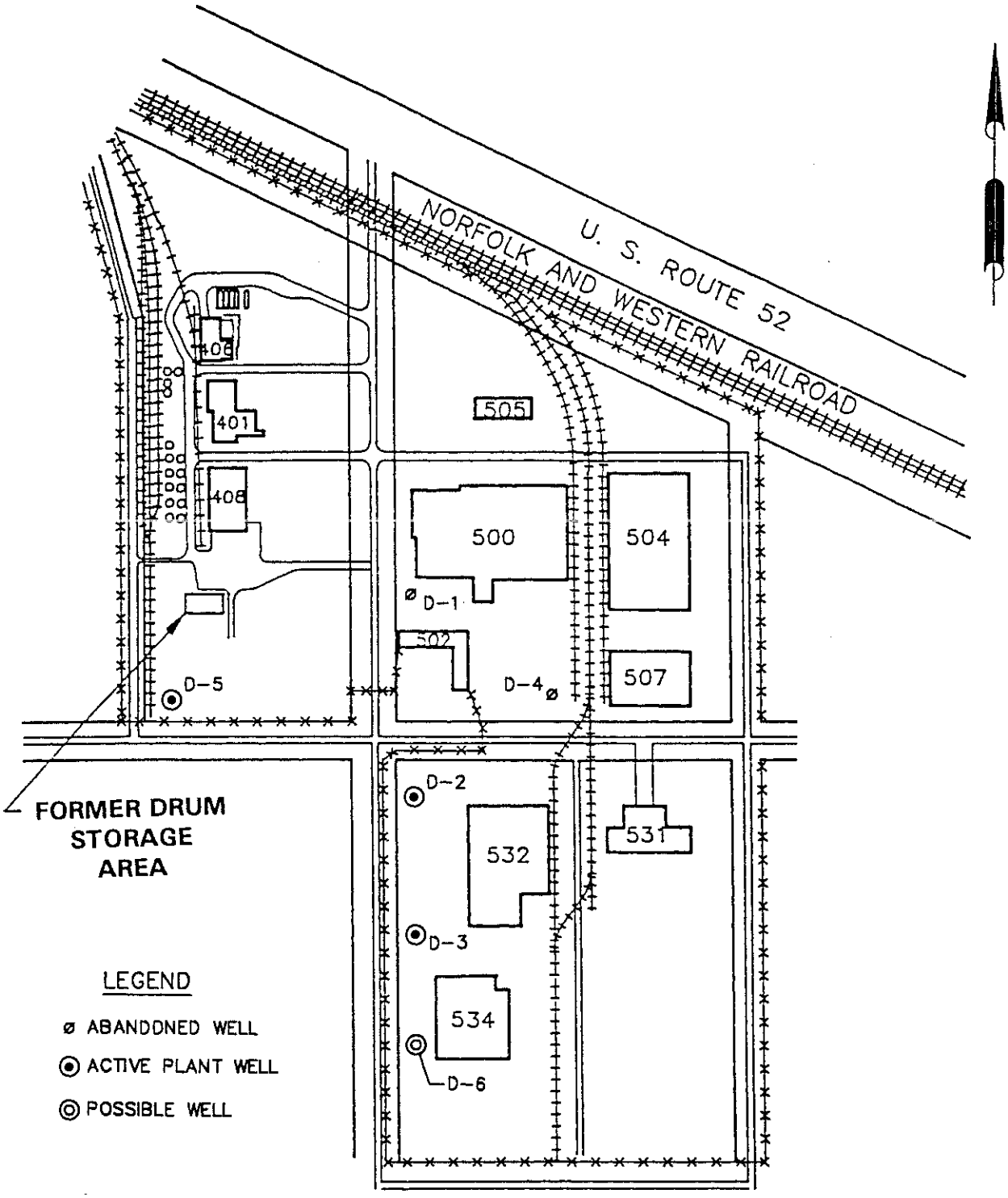
0117951RTH

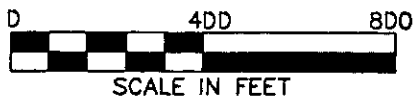
DOW Dow Environmental

HISTOGRAM OF BARIUM CONCENTRATIONS
NATURAL LOG TRANSFORM

HANGING ROCK – OLD DRUM STORAGE AREA IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-500	
SCALE: NONE	FIGURE NUMBER 12		REV 0



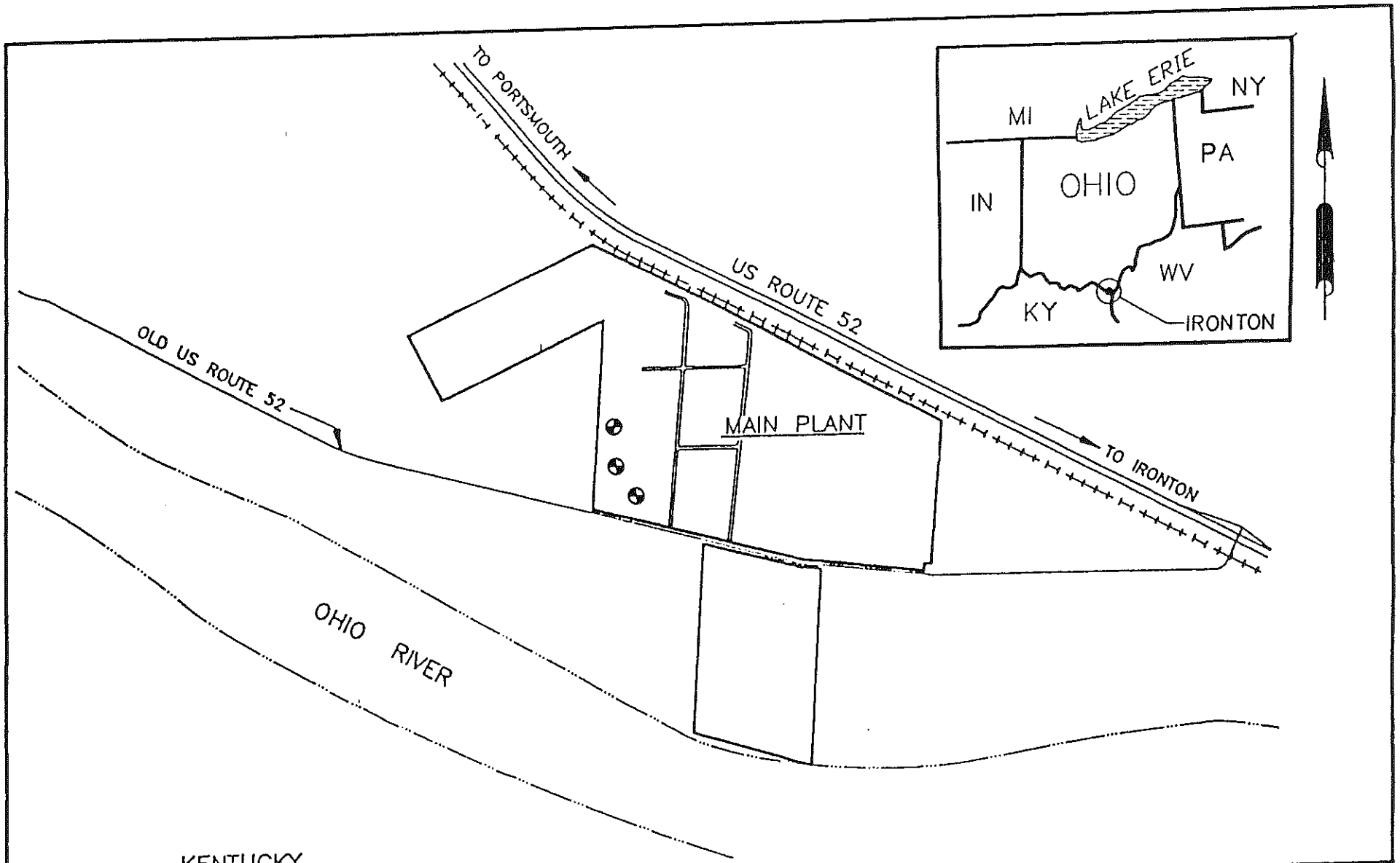


NOTE: ONLY MAIN FEATURES ARE SHOWN ON THIS PLAN.

Dow Environmental

DOW PLANT WELL LOCATIONS

HANGING ROCK CLOSURE			IRONTON, OH
CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER:	7015-500
SCALE: AS SHOWN	FIGURE NUMBER	13	REV 0



0 2000 4000
SCALE IN FEET

Dow Environmental

PROPOSED GROUNDWATER MONITORING WELL LOCATIONS

HANGING ROCK CLOSURE — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-500	
SCALE: AS SHOWN	FIGURE NUMBER 14		REV 0

PHASE IV SAMPLING REPORT AND MANAGEMENT PLAN

FOR

FORMER DRUM STORAGE AREA HANGING ROCK PLANT IRONTON, OHIO

VOLUME TWO: APPENDICES

PREPARED FOR

THE DOW CHEMICAL COMPANY

PREPARED BY

DOW ENVIRONMENTAL INC.
PITTSBURGH, PENNSYLVANIA

PROJECT NUMBER 7015.500

FEBRUARY 1995

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2	Summary of QA/QC Sample Analysis
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4	Summary of Background Barium Concentrations and Derivation of Site-Specific Action Level

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APPENDIX A

SAMPLING AND ANALYSIS PLAN
ADDITIONAL SAMPLING

SAMPLING AND ANALYSIS PLAN
ADDITIONAL SAMPLING

FOR

OLD DRUM STORAGE AREA

HANGING ROCK PLANT
IRONTON, OHIO

Prepared for:
THE DOW CHEMICAL COMPANY

Prepared by:
AWD TECHNOLOGIES, INC.
PITTSBURGH, PENNSYLVANIA

PROJECT NUMBER 7015-500

SEPTEMBER 1994

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1	Tentative Background Sample Locations
2	Sample Locations Soil Analysis
3	Chain-of-Custody Form

TABLES

NUMBER	
1	Proposed Soil Sampling Locations

1.0 INTRODUCTION

This Sampling and Analysis Plan describes soil sampling that will aid in adequately defining the horizontal and vertical extent of contamination associated with the Old Drum Storage Area at the Dow Chemical Company, Hanging Rock Plant in Ironton, Ohio. The data obtained from this phase of sampling will be used in support of the Human Health Risk Assessment (HHRA) for this Closure Plan. Once the HHRA has been deemed representative of worst-case site concentrations by OEPA, the Closure Plan will be revised, as needed, so that closure activities may proceed.

Three phases of closure activities have previously been conducted at this site. Those phases were conducted prior to incorporation of a human health-based approach for closure of this area. The potential health risks of two of the five constituents identified at this site, ethylbenzene (EB) and styrene (ST), were evaluated in the HHRA prepared as a supplement to the Closure Plan Modification for this site. The OEPA has subsequently requested that additional sampling be conducted to demonstrate that concentrations of EB and ST used in the HHRA are representative of the worst-case site contamination. Consequently, this Sampling Plan has been devised, in part, to provide surface soil data appropriate to demonstrating that concentrations of EB and ST decrease away from the site. The intent is to demonstrate that concentrations decrease at three consecutive points relative to previously detected surface concentrations.

In addition, OEPA has requested confirmation sampling relative to headspace data collected during Phase III of closure activities. This sampling will be confined to a maximum of 8 feet in depth. The 8-foot depth has been established relative to prior investigations that established an underground sewer line as a potential source of acrylonitrile (AN), ST, and EB. Vertical profiles based on headspace data (reported in the Closure Plan Modification as Figure 4) concluded that the sewer line was the likely source of these contaminants.

2.0 SAMPLING PROTOCOL

2.1 Sample Type and Parameters to be Analyzed

All soil samples collected during this phase of investigation will be discrete grab samples. Soil samples collected during this phase will be analyzed for acrylonitrile (AN), styrene (ST), methylene chloride (MC), ethylbenzene (EB), and barium (Ba).

2.2 Sampling Locations and Number

2.2.1 Background Samples

Two areas have been identified on Figure 1 for background surface soil sampling. These areas have been selected to represent areas not directly affected by the RCRA unit. These areas also are of the same soil horizon as material at the Old Drum Storage Area. Twelve soil samples will be collected from one or both of these areas. The actual sample locations will be determined in the field by a geologist. These soil samples will be used to establish a site-specific background concentration for naturally-occurring barium in soil.

2.2.2 Vertical and Horizontal Extent

Twelve new soil borings will be installed to evaluate the vertical and horizontal extent of contamination. These borings will be sampled at the surface, at the 2 to 3 foot depth, at the 5 to 6 foot depth, and at the 7 to 8 foot depth. These borings are identified on Figure 2. These locations coincide with previously collected sample points where constituent concentrations did not display a decreasing trend over three consecutive locations.

Ten additional locations will be sampled for surface soils. Eight of these locations will require penetration of existing asphalt for collection of surface soils within 1 foot of the surface.

Twenty-eight of these samples may not require analysis. These samples are identified in Table 1. Analysis will not be performed if a decreasing trend in concentrations is demonstrated by the adjacent sample points.

2.2.3 Headspace Confirmation

Nineteen samples will be collected from 13 separate borings to confirm prior headspace data. These sample locations are shown in Figure 2 and are summarized in Table 1.

2.3 Sampling Methods

2.3.1 Soil Borings

Soil sampling will be conducted with the Geoprobe sampling system. Geoprobe is a truck-mounted push probe sampling system.

Borings will be drilled using the truck-mounted Geoprobe system to a depth of 8 feet. This system advances an approximately 1 3/4-inch diameter boring by use of a hydraulic hammer which drives a threaded push rod into the subsurface until the desired sampling depth is attained. No drill cuttings are generated by this process. Soil samples are obtained by loosening the drive point of the push rod and inserting a smaller diameter threaded rod through the drilling string. This smaller diameter rod is used to turn (loosen) the drive point. A sample can then be collected by advancing the drill string with the hydraulic hammer. After collection, all drill rods are removed from the borehole. The soil sample is contained within the drive point sampler which acts as the lead rod. The sample is collected within a clear acetate inner liner which is pushed out of the outer sampling tube.

Once removed, the sample is logged and containerized for laboratory analysis. The samples will be logged by the onsite field personnel in accordance with the unified Soil Classification System (USCS). Samples will be stored in sealed 8 ounce glass jars at 4°C throughout shipment to the offsite laboratory.

Upon completion of drilling, each borehole will be sealed with a cement/bentonite grout. Wastes generated from investigation activities will be containerized onsite in sealed drums for future offsite disposal.

2.3.2 Surface Grab Samples

Surface soil grab samples (i.e., background samples and surface samples where asphalt is not present) will be collected with a clean trowel or stainless steel spoon/scoop. Soil will be placed into a clean 8 ounce sample jar. The jar will be sealed and labeled for transport to the laboratory. Samples will be stored at 4°C throughout shipment to the offsite laboratory.

2.3.3 Sample Numbering

A standard numbering system shall be used to identify each sample taken in order to provide a tracking procedure for retrieval of information. Sample numbers shall be assigned as follows:

1. Three digit project identifier (i.e., DHR for Dow-Hanging Rock), followed by a

2. three digit sample location number as specified on the sample location map (i.e., 49A, 51A, etc.), followed by a

3. two digit indicator of the depth interval, as applicable, and a

4. six digit date identifier (to permit quick reference to field logs).

An example follows:

DHR-49A-23-101094

For this example, the sample was collected at Dow Hanging Rock sample location 49A, from the 2- to 3-foot depth interval, on October 10, 1994.

3.0 EQUIPMENT DECONTAMINATION

Decontamination of all sampling equipment will occur at the beginning and end of the entire sampling event. Sample recovery rods used in the collection of subsurface soil samples at discrete depths will be decontaminated between the collection of the individual samples. Trowels/scoops used for surface sampling will be decontaminated prior to and following collection of each sample.

A portable decontamination station will be set up at a predetermined location. Necessary equipment and materials include: brushes for dry and wet removal of soils adhering to equipment; pails to collect washwaters, rinse water(s), and solvent (hexane) rinse; potable rinse water; polar water; hexane; and detergent wash.

The following procedures will be employed for the proper decontamination of sampling equipment:

- Soils adhering to equipment are brushed off (dry)
- Rinse and/or wet brushing of equipment in a pail of potable water is performed followed by
- Detergent washing of equipment over a washwater collection pail
- Second potable water rinse over the waste collection pail
- Solvent rinse over the waste collection pail
- Polar water rinse over a rinsate water collection pail
- Air drying of equipment prior to reuse

Waste materials generated by the decontamination process will be drummed onsite and characterized as needed for disposal.

4.0 ANALYTICAL METHODS AND QA/QC

4.1 Laboratory

Samples will be shipped to Lancaster Laboratories, 2425 New Holland Pike, Lancaster, Pennsylvania 17601-5994 (Telephone 717-656-2301). Chain-of-custody forms will accompany all samples to the laboratory. A copy of each chain-of-custody form will be maintained by the Project Manager (an example form is attached as Figure 3).

4.2 Analysis

Samples will be analyzed for methylene chloride, ethylbenzene, acrylonitrile, and styrene by U.S. EPA SW-846 Method 8240. Samples will be analyzed for barium by SW-846 Method 7080. The holding times for the volatile organic analysis is 14 days and for metals analysis, 6 months. All concentration data will be reported, even if it is estimated, for compounds that have been positively identified in the sample.

4.3 Quality Assurance/Quality Control

Lancaster Laboratories is qualified in performed SW-846 Method 8240 and 7080. Sample analysis reports will include the following infirmation: sample analysis result and detection limits, surrogate recoveries, sample holding times, and analysis of blanks and duplicates, as applicable. The laboratory will prepare trip blanks with each sample shipment as well as internal blanks and spikes.

The field and laboratory quality control requirements will include the following:

- Ten percent of field duplicate collection and analysis.
- One trip blank per cooler.

- Five percent of matrix spike and matrix spike duplicate sample collection and analysis.

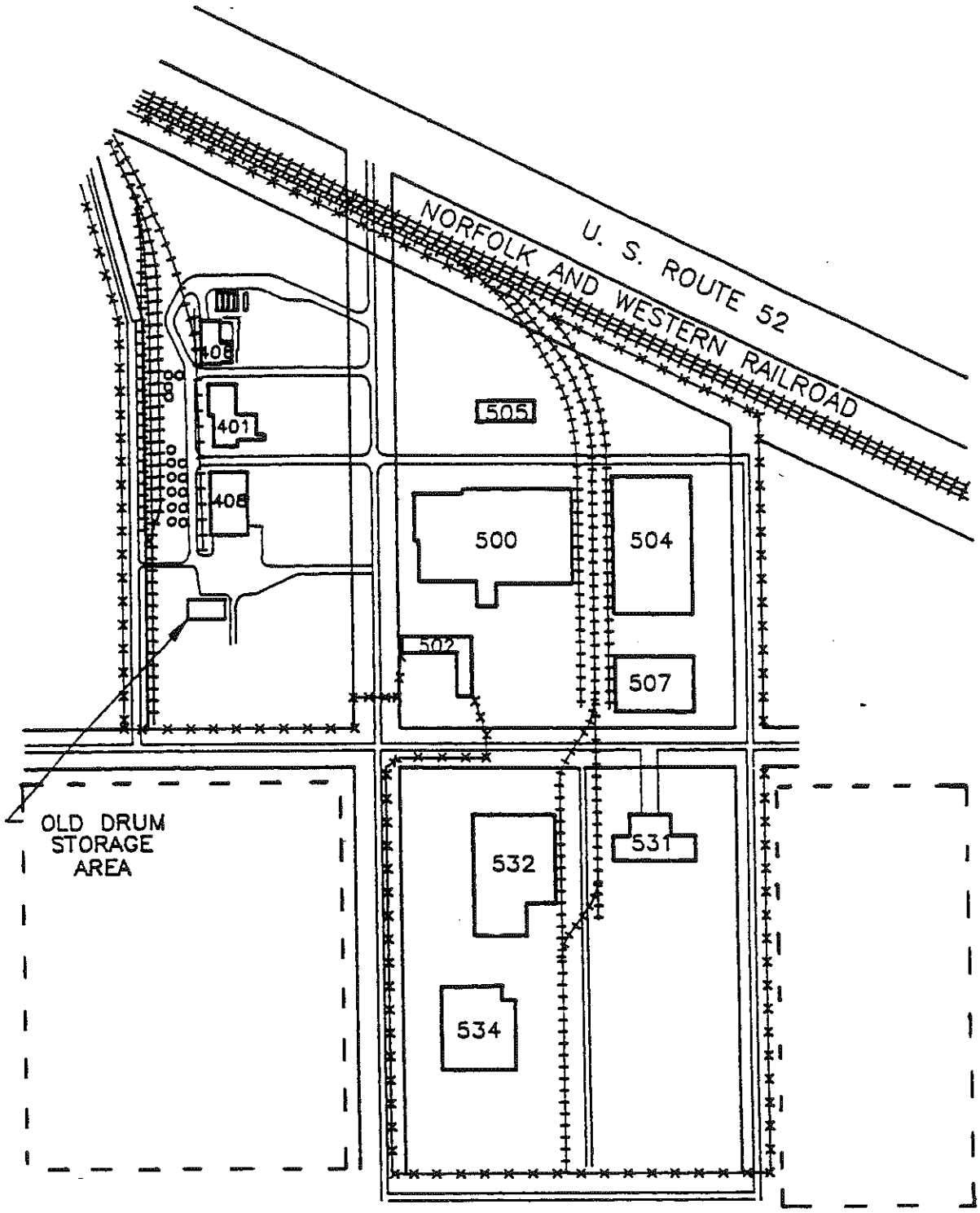
- There are also specified frequencies for laboratory blanks (1/20) and duplicates (1/20) required for analytical quality control.

5.0 SCHEDULE

Field sampling activities will be scheduled to commence within 2 weeks, but no sooner than 5 working days, after verbal concurrence with this plan by OEPA. Field activities are anticipated to be completed within 3 days of initiation.

Laboratory results will be provided within 14 working days of receipt by the laboratory.

FIGURES



- - - - BOUNDARY OF TENTATIVE BACKGROUND SAMPLING LOCATIONS

0 400 800
SCALE IN FEET

NOTE: ONLY MAIN FEATURES ARE SHOWN ON THIS PLAN.

AWD TECHNOLOGIES, INC

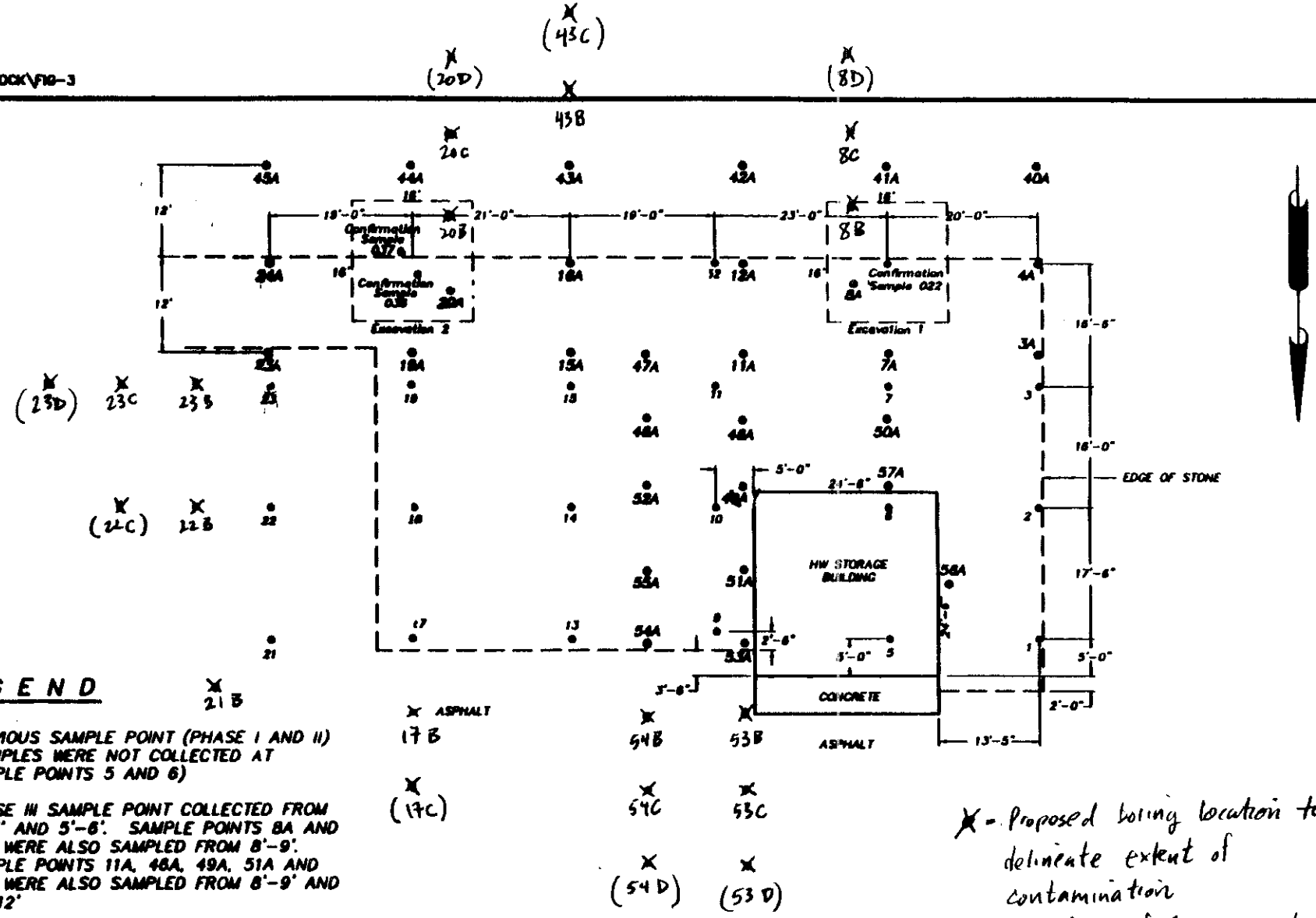
AWD TECHNOLOGIES

TENTATIVE BACKGROUND SAMPLE LOCATIONS

HANGING ROCK CLOSURE — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY		JOB NUMBER: 7015-500	
SCALE: AS SHOWN	FIGURE NUMBER 1		REV 0

FILE: \HANGROCK\F19-3



LEGEND

- PREVIOUS SAMPLE POINT (PHASE I AND II) (SAMPLES WERE NOT COLLECTED AT SAMPLE POINTS 5 AND 6)
- PHASE III SAMPLE POINT COLLECTED FROM 2'-3' AND 5'-6'. SAMPLE POINTS 8A AND 20A WERE ALSO SAMPLED FROM 8'-9'. SAMPLE POINTS 11A, 46A, 49A, 51A AND 53A WERE ALSO SAMPLED FROM 8'-9' AND 11'-12'

X = Proposed boring location to delineate extent of contamination

(XXX) = Analysis of these samples only if needed

REFERENCE

BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

0 20 40

SCALE IN FEET

0 0 9 0 2 0 1 0 9 0 3 0 K 0 C

AWD TECHNOLOGIES, INC

AWD TECHNOLOGIES

SAMPLE LOCATIONS SOIL ANALYSIS

HANGING ROCK CLOSURE — IRONTON, OH

CLIENT: DOW CHEMICAL COMPANY — JOB NUMBER: 7015-500

SCALE: AS SHOWN — FIGURE NUMBER 2 — REV 0

FIGURE 3
CHAIN-OF-CUSTODY FORM

AWD TECHNOLOGIES

CHAIN-OF-CUSTODY RECORD

PROJECT NO.:	PROJECT NAME:
SAMPLERS (PRINT):	SAMPLERS (SIGNATURE):

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE TYPE	SAMPLE LOCATION	NO. OF CON-TAINERS							REMARKS

RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED FOR LABORATORY BY (SIGNATURE):	REMARKS:		

TABLES

TABLE 1

PROPOSED SOIL SAMPLING LOCATIONS
DOW HANGING ROCK
PAGE 1 OF 2

Headspace Confirmation (vertical)			Horizontal Extent				
Location[a]	Depth		Location[a]	Depth			
	2'-3'	5'-6'		Surface	2'-3'	5'-6'	7'-8'
8A		X[b]	53B	X	X	X	O[c]
			53C	X	X	X	O
11A	X	X	53D	O	O	O	O
			54B	X	X	X	O
16A	X		54C	X	X	X	O
			54D	O	O	O	O
19A	X		17B	X			
			17C	O			
20A		X	21B	X			
			22B	X			
46A	X	X	22C	O			
			23B	X			
48A	X		23C	X			
			23D	O			

Notes

[a] - Locations are indicated on Figure 2.
[b] - X = Sample will be analyzed for acrylonitrile, styrene, methylene chloride, ethylbenzene, and barium
[c] - O = Analysis of sample may not be required to delineate extent of contamination.

TABLE 1

PROPOSED SOIL SAMPLING LOCATIONS
DOW HANGING ROCK
PAGE 2 OF 2

Headspace Confirmation (vertical)			Horizontal Extent				
Location[a]	Depth		Location[a]	Depth			
	2'-3'	5'-6'		Surface	2'-3'	5'-6'	7'-8'
49A	X	X	20B	X	X	X	O
			20C	X	X	X	O
51A	X	X	20D	O	O	O	O
			43B	X			
52A	X		43C	O			
			8B	X	X	X	O
53A	X	X	8C	X	X	X	O
			8D	O	O	O	O
54A	X	X					
55A	X						

Notes

[a] - Locations are indicated on Figure 2.
[b] - X = Sample will be analyzed for acrylonitrile, styrene, methylene chloride, ethylbenzene, and barium
[c] - O = Analysis of sample may not be required to delineate extent of contamination.

APPENDIX B

SAMPLE COLLECTION LOGS

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BD-Ø2-102094

DATE & TIME COLLECTED: 10/20/94 0935

SAMPLE LOCATION: BD - South of Excavation 1

SAMPLE DESCRIPTION: Brown silt, little clay, trace rock fragments and plant roots, moist

SAMPLE DEPTH INTERVAL: 0-2 Ft.

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe — Horizonted Extent Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-8D-24-102094

DATE & TIME COLLECTED: 10/20/94 0940

SAMPLE LOCATION: 8D - South of Excavation

SAMPLE DESCRIPTION: Soft, brown silt, little clay, black organic staining, moist to wet

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-8D-4b-102094

DATE & TIME COLLECTED: 10/20/94 0945

SAMPLE LOCATION: 8D - South of Excavation 1

SAMPLE DESCRIPTION: Soft, brown silt, little clay, moist to wet

SAMPLE DEPTH INTERVAL: 4-6 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BD-68-102094

DATE & TIME COLLECTED: 10/20/94 0955

SAMPLE LOCATION: BD - South of Excavation 1

SAMPLE DESCRIPTION: Soft, brown silt, little clay, moist to wet

SAMPLE DEPTH INTERVAL: 6-8 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BC-Ø2-102094

DATE & TIME COLLECTED: 10/20/94 1000

SAMPLE LOCATION: BC - South of Excavation 1

SAMPLE DESCRIPTION: Medium stiff, light brown silt, little clay, plant debris, moist

SAMPLE DEPTH INTERVAL: 0-2 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BC-24-102094

DATE & TIME COLLECTED: 10/20/94 1010

SAMPLE LOCATION: BC - South of Excavation 1

SAMPLE DESCRIPTION: Light brown to brown silt, little Clay, moist

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 + Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-8C-46-102094

DATE & TIME COLLECTED: 10/20/94 1020

SAMPLE LOCATION: 8C - South of Excavation 1

SAMPLE DESCRIPTION: Soft, brown, light gray-brown mottles, Silt, little Clay, moist to wet

SAMPLE DEPTH INTERVAL: 4-6 Ft.

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-8C-68-102094

DATE & TIME COLLECTED: 10/20/94 1040

SAMPLE LOCATION: 8C - South of Excavation 1

SAMPLE DESCRIPTION: Soft, brown silt, some clay, moist to wet

SAMPLE DEPTH INTERVAL: 6-8 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 8B - Ø2 - 102094

DATE & TIME COLLECTED: 10/20/94 1145

SAMPLE LOCATION: 8B - South of Excavation 1

SAMPLE DESCRIPTION: Light brown and light gray-brown mottled Silt, little clay, plant debris, moist

SAMPLE DEPTH INTERVAL: 0-2 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 8B - 24 - 102094

DATE & TIME COLLECTED: 10/20/94 1150

SAMPLE LOCATION: 8B - South of Excavation 1

SAMPLE DESCRIPTION: Soft, brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 Only

COMMENTS: Collected via Geoprobe - Horizontal Extract. Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-8B-46-102094

DATE & TIME COLLECTED: 10/20/94 1155

SAMPLE LOCATION: 8B - South of Excavation 1

SAMPLE DESCRIPTION: Soft, brown silt, little to some clay, moist to wet

SAMPLE DEPTH INTERVAL: 4-6 Ft.

ANALYTICAL PARAMETERS: 8240 + Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BB-68-102094

DATE & TIME COLLECTED: 10/20/94 1205

SAMPLE LOCATION: BB - South of Excavation 1

SAMPLE DESCRIPTION: Very soft, brown, clay and silt, wet

SAMPLE DEPTH INTERVAL: 6-8 Ft.

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent. Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-8B-24-102094

DATE & TIME COLLECTED: 10/20/94 1215

SAMPLE LOCATION: 8B - South of Excavation 1

SAMPLE DESCRIPTION: Soft, brown silt, some clay, moist

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: Barium Only

COMMENTS: Collected via Geoprobe - Offset location for 2-4 Ft resample to collect barium sample - Horizontal Extent. Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-11A-24-102094

DATE & TIME COLLECTED: 10/20/94 1355

SAMPLE LOCATION: 11A - Central portion of investigation area

SAMPLE DESCRIPTION: Medium stiff, light brown, light gray mottles, silt, little clay, moist.

SAMPLE DEPTH INTERVAL: 2-4 Ft.

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Headspace Confirmation Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-11A-46-102094

DATE & TIME COLLECTED: 10/20/94 1410

SAMPLE LOCATION: 11A - Central portion of investigation area.

SAMPLE DESCRIPTION: Brown, olive-brown, medium to coarse grained sandstone fragments and sand, moist

SAMPLE DEPTH INTERVAL: 4-6 Ft.

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Headspace confirmation sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 46A - 24 - 102094

DATE & TIME COLLECTED: 10/20/94 1455

SAMPLE LOCATION: 46A - Central portion of investigation area, north of 11A

SAMPLE DESCRIPTION: Brown, light gray mottles and natural black-brown staining, silt, little clay, moist.

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Headspace Confirmation Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-46A-46-102094

DATE & TIME COLLECTED: 10/20/94 1505

SAMPLE LOCATION: 46A - Central portion of investigation area, north of 11A

SAMPLE DESCRIPTION: Medium stiff, brown, natural black organic staining, silt, little clay, moist

SAMPLE DEPTH INTERVAL: 4-6 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Headspace Confirmation Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-49A-24-102094

DATE & TIME COLLECTED: 10/20/94 1610

SAMPLE LOCATION: 49A - Central portion of investigation area, north of 46A

SAMPLE DESCRIPTION: Brown, medium to coarse grained sand, some silt, little rock fragments, moist

SAMPLE DEPTH INTERVAL: 2-4 Ft.

ANALYTICAL PARAMETERS: 8240 Only

COMMENTS: Collected via Geoprobe - Headspace confirmation sample.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DITR-49A-46-102094

DATE & TIME COLLECTED: 10/20/94 1620

SAMPLE LOCATION: 49A - Central portion of investigation area, north of 46A

SAMPLE DESCRIPTION: Brown, medium to coarse grained sand, little silt, chemical odor (PID - 120ppm), moist to wet

SAMPLE DEPTH INTERVAL: 4 - 6 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Headspace confirmation sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-49A-24-102094

DATE & TIME COLLECTED: 10/20/94 1630

SAMPLE LOCATION: 49A - Central portion of investigation area, north of 46A

SAMPLE DESCRIPTION: Brown, light gray mottles, silt, some clay, wet

SAMPLE DEPTH INTERVAL: 2-4 Ft.

ANALYTICAL PARAMETERS: Barium Only

COMMENTS: Collected via Geoprobe - Offset location for resample of 2-4 Ft. interval to collect Barium sample - Headspace confirmation sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-51A-24-102094

DATE & TIME COLLECTED: 10/20/94 1710

SAMPLE LOCATION: 51A - East side of HW Storage Building, north of 49A

SAMPLE DESCRIPTION: Brown silt, little clay, brown medium to coarse grained sand @ 4.0', wet

SAMPLE DEPTH INTERVAL: 2-4 ft

ANALYTICAL PARAMETERS: 8240 Only

COMMENTS: Collected via Geoprobe - Headspace Confirmation sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-51A-46-102094

DATE & TIME COLLECTED: 10/20/94 1715

SAMPLE LOCATION: 51A - East side of Hwl Storage Building, north of 49A

SAMPLE DESCRIPTION: Dark brown coarse grained sand and rock fragments, little silt, saturated

SAMPLE DEPTH INTERVAL: 4-6 Ft.

ANALYTICAL PARAMETERS: 8240 Only

COMMENTS: Collected via Geoprobe - Headspace confirmation sample.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-51A-24-102094

DATE & TIME COLLECTED: 10/20/94 1730

SAMPLE LOCATION: 51A - East side of HW Storage Building, North of 49A

SAMPLE DESCRIPTION: Brown, light gray mottles, silt and clay, moist

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: Barium Only

COMMENTS: Collected via Geoprobe - Offset location to resample 2-4 Ft interval for Barium Sample - Headspace confirmation sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-51A-46-102094

DATE & TIME COLLECTED: 10/20/94 1740

SAMPLE LOCATION: 51A - East side of HW Storage Building, north of 49A

SAMPLE DESCRIPTION: Soft, brown, light gray mottles, silt, little clay, moist to wet

SAMPLE DEPTH INTERVAL: 4 - 6 Ft.

ANALYTICAL PARAMETERS: Barium Only

COMMENTS: Collected via Geoprobe - Offset location to resample 4-6 Ft interval for barium sample - Headspace confirmation sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53A-24-102194

DATE & TIME COLLECTED: 10/21/94 0930

SAMPLE LOCATION: 53A - East side of HW Storage Building, north of 51A

SAMPLE DESCRIPTION: Brown silt, some clay, moist

SAMPLE DEPTH INTERVAL: 2-4 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Headspace confirmation sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53A-46-102194

DATE & TIME COLLECTED: 10/21/94 0935

SAMPLE LOCATION: 53A - East side of HW Storage Building, north of 51A

SAMPLE DESCRIPTION: Brown silt and clay, moist

SAMPLE DEPTH INTERVAL: 4-6 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Headspace Confirmation Sample.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 53B - 13 - 102194

DATE & TIME COLLECTED: 10/21/94 1011

SAMPLE LOCATION: 53B - Northeast Corner of HW Storage Building, north of 53A

SAMPLE DESCRIPTION: Brown, light gray mottles, silt, some clay, moist

SAMPLE DEPTH INTERVAL: 1-3 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected with Geoprobe — Horizontal Extent — Asphalt Surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53B-35-102194

DATE & TIME COLLECTED: 10/21/94 1015

SAMPLE LOCATION: 53B - Northeast Corner of HW Storage Building, north of 53A

SAMPLE DESCRIPTION: Brown silt, some clay, trace shale fragments, saturated

SAMPLE DEPTH INTERVAL: 3-5 Ft.

ANALYTICAL PARAMETERS: 8240 + Barium

COMMENTS: Collected with Geoprobe - Horizontal Extent - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53B-57-102194

DATE & TIME COLLECTED: 10/21/94 1020

SAMPLE LOCATION: 53B - Northeast Corner of HW Storage Building, north of 53A

SAMPLE DESCRIPTION: Brown, fine to coarse grained sand, trace very fine gravel, chemical odor (PID - 90 ppm), saturated

SAMPLE DEPTH INTERVAL: 5-7 Ft.

ANALYTICAL PARAMETERS: 8240 Only

COMMENTS: Collected via Geoprobe - Horizontal Extent - Asphalt surface.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53B-57-102194

DATE & TIME COLLECTED: 10/21/94 1055

SAMPLE LOCATION: 53B - Northeast Corner of HW Storage Building, North of 53A

SAMPLE DESCRIPTION: Brown, medium to coarse grained sand, moist, chemical odor

SAMPLE DEPTH INTERVAL: 5-7 Ft.

ANALYTICAL PARAMETERS: Barium Only

COMMENTS: Collected via Geoprobe - Horizontal Extent - Offset location for resample of 5-7 Ft interval to collect Barium sample - Asphalt Surface.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 53B - 79 - 102194

DATE & TIME COLLECTED: 10/21/94 1100

SAMPLE LOCATION: 53B - Northeast corner of HW Storage Building, north of 53A

SAMPLE DESCRIPTION: Brown silt, little clay, Chemical odor (PID - 79 ppm), wet

SAMPLE DEPTH INTERVAL: 7-9 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent - Asphalt Surface.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53C-13-102194

DATE & TIME COLLECTED: 10/21/94 1120

SAMPLE LOCATION: 53C - Northcentral portion of Investigation, north of HW Storage Building

SAMPLE DESCRIPTION: Light brown to brown, light gray mottles, silt, little clay, slight chemical odor, moist

SAMPLE DEPTH INTERVAL: 1-3 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - 8240 Duplicate also Collected. - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53C-35-102194

DATE & TIME COLLECTED: 10/21/94 1145

SAMPLE LOCATION: 53C - North-central portion of Investigation area, north of 53B

SAMPLE DESCRIPTION: Brown, light gray mottles, silt, little clay, moist

SAMPLE DEPTH INTERVAL: 3-5 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 53C - 57 - 102194

DATE & TIME COLLECTED: 10/21/94 1155

SAMPLE LOCATION: 53C - North - Central portion of investigation area, north of 53B

SAMPLE DESCRIPTION: Brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 5-7 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt Surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53C-79-102194

DATE & TIME COLLECTED: 10/21/94 1205

SAMPLE LOCATION: 53C - North-central portion of investigation area, north of 53B

SAMPLE DESCRIPTION: Light brown to brown silt, little clay, moist to wet, slight chemical odor (PID - 30 ppm)

SAMPLE DEPTH INTERVAL: 7-9 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53C-911-102194

DATE & TIME COLLECTED: 10/21/94 1215

SAMPLE LOCATION: 53C - North-central portion of investigation area, north of 53B

SAMPLE DESCRIPTION: Brown silt, little very fine grained sand, trace clay, saturated

SAMPLE DEPTH INTERVAL: 9-11 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53D-13-102194

DATE & TIME COLLECTED: 10/21/94 1340

SAMPLE LOCATION: 53D - North-Central portion of investigation area, north of 53C

SAMPLE DESCRIPTION: Light brown, iron staining, silt, some clay, moist

SAMPLE DEPTH INTERVAL: 1-3 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53D-35-102194

DATE & TIME COLLECTED: 10/21/94 1345

SAMPLE LOCATION: 53D - North-central portion of investigation area, north of 53C

SAMPLE DESCRIPTION: Light Brown, brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 3-5 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt surface.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 53D - 57 - 102194

DATE & TIME COLLECTED: 10/21/94 1350

SAMPLE LOCATION: 53D - North-Central portion of investigation area, north of 53C

SAMPLE DESCRIPTION: Brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 5-7 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample - Asphalt Surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-53D-79-102194

DATE & TIME COLLECTED: 10/21/94 1400

SAMPLE LOCATION: 53D - North-Central portion of investigation area, north of 53C

SAMPLE DESCRIPTION: Brown silt, some clay, moist to wet

SAMPLE DEPTH INTERVAL: 7-9 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 54D - 13 - 102194

DATE & TIME COLLECTED: 10/21/94 1415

SAMPLE LOCATION: 54D - ~ 10' North of 54C, ~ 12' East of 53D

SAMPLE DESCRIPTION: Brown to dark brown silt, little clay, damp to moist

SAMPLE DEPTH INTERVAL: 1-3 Ft

ANALYTICAL PARAMETERS: 8240 + Barium

COMMENTS: Collected via Geoprobe, Horizontal Extent Sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54D-35-102194

DATE & TIME COLLECTED: 10/21/94 1420

SAMPLE LOCATION: 54D - ~10' north of 54C ; ~12' east of 53D

SAMPLE DESCRIPTION: Brown, light gray mottles, silt, little clay, moist to wet

SAMPLE DEPTH INTERVAL: 3-5 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54D-57-102194

DATE & TIME COLLECTED: 10/21/94 1430

SAMPLE LOCATION: 54D - ~10' North of 53C ; ~12' east of 53D

SAMPLE DESCRIPTION: Brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 5-7 Ft.

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54D-79-102194

DATE & TIME COLLECTED: 10/21/94 1435

SAMPLE LOCATION: 54D - ~10' North of 54C ; ~12' East of 53D

SAMPLE DESCRIPTION: Brown silt, some clay, moist

SAMPLE DEPTH INTERVAL: 7-9' Ft.

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt surface.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54C-13-102194

DATE & TIME COLLECTED: 10/21/94 1455

SAMPLE LOCATION: 54C - ~ 10' north of 54B; ~ 12' east of 53C

SAMPLE DESCRIPTION: Stiff, brown, light gray mottles, silt, little clay, moist

SAMPLE DEPTH INTERVAL: 1-3 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt surface - Barium duplicate sample also collected.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54C-35-102194

DATE & TIME COLLECTED: 10/21/94 1505

SAMPLE LOCATION: 54C - ~10' north of 54B ; ~12' east of 53C

SAMPLE DESCRIPTION: Brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 3-5 Ft.

ANALYTICAL PARAMETERS: 8240 ; Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54C-57-102194

DATE & TIME COLLECTED: 10/21/94 1510

SAMPLE LOCATION: 54C - ~ 10' north of 53B; ~ 12' east of 53C

SAMPLE DESCRIPTION: Soft, brown silt, little clay, trace black organic staining, moist

SAMPLE DEPTH INTERVAL: 5-7 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 54C - 79 - 102194

DATE & TIME COLLECTED: 10/21/94 1515

SAMPLE LOCATION: 54C - ~ 10' north of 54B ; ~12' east of 53C

SAMPLE DESCRIPTION: Medium stiff, brown silt, little clay, trace very fine grained sand, moist

SAMPLE DEPTH INTERVAL: 7-9 Ft.

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54B-13-102194

DATE & TIME COLLECTED: 10/21/94 1530

SAMPLE LOCATION: 54B - Northcentral portion of site, ~ 10' South of 54C

SAMPLE DESCRIPTION: Medium stiff, brown to light brown, silt, little clay, damp to moist

SAMPLE DEPTH INTERVAL: 1-3 Ft.

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54B-35-102194

DATE & TIME COLLECTED: 10/21/94 1540

SAMPLE LOCATION: 54B - Northcentral area of investigation site, ~10' South of 54C

SAMPLE DESCRIPTION: Brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 3-5 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54B-57-102194

DATE & TIME COLLECTED: 10/21/94 1545

SAMPLE LOCATION: 54B - North central portion of investigation area, ~ 10' south of 54C

SAMPLE DESCRIPTION: Brown silt, some clay, moist

SAMPLE DEPTH INTERVAL: 5-7 Ft

ANALYTICAL PARAMETERS: 8240 + Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt Surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54B-79-102194

DATE & TIME COLLECTED: 10/21/94 1550

SAMPLE LOCATION: 54B - North central portion of investigation area, ~10' south of 54C

SAMPLE DESCRIPTION: Brown silt, some clay, moist to wet

SAMPLE DEPTH INTERVAL: 7-9 Ft

ANALYTICAL PARAMETERS: 8240 + Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt @ surface.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54A-24-102194

DATE & TIME COLLECTED: 10/21/94 1610

SAMPLE LOCATION: 54A - Northcentral portion of investigation area - ~10' south of 54B

SAMPLE DESCRIPTION: Brown, light gray mottling, silt little clay, damp

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Headspace Confirmation Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-54A-46-102194

DATE & TIME COLLECTED: 10/21/94 1615

SAMPLE LOCATION: 54A - Northcentral portion of investigation area, ~ 10' south of 54B

SAMPLE DESCRIPTION: Brown silt, little to some clay, moist to wet

SAMPLE DEPTH INTERVAL: 4-6 Ft.

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Headspace Confirmation Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-55A-24-102194

DATE & TIME COLLECTED: 10/21/94 1635

SAMPLE LOCATION: 55A - Northcentral portion of investigation area, ~10' south of 54A

SAMPLE DESCRIPTION: Medium stiff, light brown to brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 ; Barium

COMMENTS: Collected via Geoprobe - Headspace confirmation sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-52A-24-102194

DATE & TIME COLLECTED: 10/21/94 1650

SAMPLE LOCATION: 52A - Central portion of Investigation area, ~ 10' South 55A

SAMPLE DESCRIPTION: Light brown to brown silt, little clay, damp to moist

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Headspace Confirmation sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-48A-24-102194

DATE & TIME COLLECTED: 10/21/94 1705

SAMPLE LOCATION: 48A - Central portion of investigation area - ~ 10' south of 52A

SAMPLE DESCRIPTION: Medium stiff, light brown to brown, light gray mottles, silt, little clay

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 ; Barium

COMMENTS: Collected via Geoprobe - Headspace confirmation sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 17B - 13 - 102194

DATE & TIME COLLECTED: 10/21/94 1715

SAMPLE LOCATION: 17B - Northeast portion of investigation area, ~ 30' east of 54C

SAMPLE DESCRIPTION: Stiff, light brown to brown, silt, little clay, damp.

SAMPLE DEPTH INTERVAL: 1-3 Ft

ANALYTICAL PARAMETERS: 8240 : Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt @ surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-17C-13-102194

DATE & TIME COLLECTED: 10/21/94 1730

SAMPLE LOCATION: 17C - Northeast corner of investigation area, ~10' north of 17B

SAMPLE DESCRIPTION: Medium stiff, light brown to brown silt, little clay, damp to moist

SAMPLE DEPTH INTERVAL: 1-3 Ft

ANALYTICAL PARAMETERS: 8240 ; Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt @ surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-19A-24-102294

DATE & TIME COLLECTED: 10/22/94 0910

SAMPLE LOCATION: 19 A - East side of investigation area, ~ 4' north of Excavation 2

SAMPLE DESCRIPTION: Brown silt, little clay, moist.

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 ; Barium

COMMENTS: Collected via Geoprobe - Headspace Confirmation sample - 8240 Duplicate Sample also collected

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-20A-46-102294

DATE & TIME COLLECTED: 10/22/94 0920

SAMPLE LOCATION: 20A - East side of investigation area - Outside, west edge of Excavation 2

SAMPLE DESCRIPTION: Brown silt, some clay, moist to wet

SAMPLE DEPTH INTERVAL: 4-6 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Headspace Confirmation Sample - Barium duplicate sample also collected.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-20B-Ø2-102294

DATE & TIME COLLECTED: 10/22/94 0930

SAMPLE LOCATION: 20B - Outside, southern edge of Excavation 2

SAMPLE DESCRIPTION: Brown and light brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 0-2 Ft

ANALYTICAL PARAMETERS: 8240 ; Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-20B-24-102294

DATE & TIME COLLECTED: 10/22/94 0935

SAMPLE LOCATION: 20B - Outside, southern edge of Excavation 2

SAMPLE DESCRIPTION: Soft, light brown and brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - 8240 Duplicate Sample also collected.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-20B-46-102294

DATE & TIME COLLECTED: 10/22/94 0940

SAMPLE LOCATION: 20B - Outside, southern edge of Excavation 2

SAMPLE DESCRIPTION: Brown to light brown silt, little to some clay, moist to wet

SAMPLE DEPTH INTERVAL: 4-6 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 20B - 68 - 102294

DATE & TIME COLLECTED: 10/22/94 0945

SAMPLE LOCATION: 20B - Outside, Southern edge of Excavation 2

SAMPLE DESCRIPTION: Brown silt, some clay, trace fine gravel and very fine grained sand, moist to wet.

SAMPLE DEPTH INTERVAL: 6-8 Ft

ANALYTICAL PARAMETERS: 8240 + Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-20C-Ø2-102294

DATE & TIME COLLECTED: 10/22/94 0955

SAMPLE LOCATION: 20C - Southeast portion of investigation area, ~ 10' south of 20B

SAMPLE DESCRIPTION: Light Brown, dark black-brown natural staining, silt trace clay, damp.

SAMPLE DEPTH INTERVAL: Ø-2 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Barium duplicate sample also collected.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-20C-24-102294

DATE & TIME COLLECTED: 10/22/94 1010

SAMPLE LOCATION: 20C - Southeast portion of investigation area, ~ 10' south of 20B

SAMPLE DESCRIPTION: Brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 2-4' Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Matrix spike (8240) sample also collected

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-20C-46-102294

DATE & TIME COLLECTED: 10/22/94 1015

SAMPLE LOCATION: 20C - Southeast portion of investigation area, ~ 10' south of 20B

SAMPLE DESCRIPTION: Soft, brown silt, some clay, moist to wet

SAMPLE DEPTH INTERVAL: 4-6 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Barium duplicate sample also collected.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-20C-6B-102294

DATE & TIME COLLECTED: 10/22/94 1020

SAMPLE LOCATION: 20C - Southeast portion of investigation area, ~10' South of 20B

SAMPLE DESCRIPTION: Soft, brown silt, some clay, moist to wet

SAMPLE DEPTH INTERVAL: 6-8 Ft

ANALYTICAL PARAMETERS: 8240 + Barium

COMMENTS: Collected via Geoprobe, Horizontal Extent Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-20D-Ø2-102294

DATE & TIME COLLECTED: 10/22/94 1030

SAMPLE LOCATION: 20D - Southeast portion of investigation area, ~10' South of 20C

SAMPLE DESCRIPTION: Stiff, light brown, silt, trace clay, damp

SAMPLE DEPTH INTERVAL: Ø-2 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 20D - 24 - 102294

DATE & TIME COLLECTED: 10/22/94 1040

SAMPLE LOCATION: 20D - Southeast portion of investigation area, ~10' south of 20C

SAMPLE DESCRIPTION: Medium stiff, brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-20D-46-102294

DATE & TIME COLLECTED: 10/22/94 1045

SAMPLE LOCATION: 20D - Southeast portion of investigation area, ~10' south of 20C

SAMPLE DESCRIPTION: Soft, brown silt, little clay, moist to wet

SAMPLE DEPTH INTERVAL: 4-6 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-20D-68-102294

DATE & TIME COLLECTED: 10/22/94 1055

SAMPLE LOCATION: 20D - Southeast corner of investigation area, ~10' south of 20C

SAMPLE DESCRIPTION: Soft, brown silt and clay, moist to wet

SAMPLE DEPTH INTERVAL: 6-8 Ft

ANALYTICAL PARAMETERS: 8240 + Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 43C - Ø2 - 102294

DATE & TIME COLLECTED: 10/22/94 1100

SAMPLE LOCATION: 43C - Southeast portion of investigation area, ~10' south of 43B

SAMPLE DESCRIPTION: Light brown, silt, trace clay, damp.

SAMPLE DEPTH INTERVAL: Ø-2 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-43B-Ø2-102294

DATE & TIME COLLECTED: 10/22/94 1105

SAMPLE LOCATION: 43B- Southeast portion of Investigation area, ~23' South of 16A

SAMPLE DESCRIPTION: Stiff, light brown silt, trace gravel, damp.

SAMPLE DEPTH INTERVAL: 0-2 Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe, Horizontal Extent Sample - 8240 Duplicate sample also collected.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 23B - 13 - 102294

DATE & TIME COLLECTED: 10/22/94 1130

SAMPLE LOCATION: 23B - East side of investigation area, ~ 10' west of 23C

SAMPLE DESCRIPTION: Brown and light brown silt, little clay, trace plant roots, moist

SAMPLE DEPTH INTERVAL: 1-3 Ft

ANALYTICAL PARAMETERS: 8240 > Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Barium duplicate sample also collected. - Asphalt @ surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-23C-13-102294

DATE & TIME COLLECTED: 10/22/94 1145

SAMPLE LOCATION: 23C - East side of investigation area, ~ 10' east of 23B, ~ 16' south of 22C

SAMPLE DESCRIPTION: Brown, light gray mottles, silt, some clay, moist

SAMPLE DEPTH INTERVAL: 1-3 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal extent sample, 8240 Duplicate sample also collected - Asphalt @ surface

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-23D-13-102294

DATE & TIME COLLECTED: 10/22/94 1200

SAMPLE LOCATION: 23D - East side of excavation area, ~ 10' east of 23C

SAMPLE DESCRIPTION: Brown silt, some clay, moist

SAMPLE DEPTH INTERVAL: 1-3' Ft

ANALYTICAL PARAMETERS: 8240 & Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt @ surface.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 22B - 13 - 102294

DATE & TIME COLLECTED: 10/22/94 1215

SAMPLE LOCATION: 22B - East side of investigation area, ~ 16' north of 23B

SAMPLE DESCRIPTION: Light brown to brown, light gray mottles, silt, little to some clay, damp to moist

SAMPLE DEPTH INTERVAL: 1 - 3 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt @ surface - 8240 duplicate sample also collected.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - 22C - 13 - 102294

DATE & TIME COLLECTED: 10/22/94 1230

SAMPLE LOCATION: 22C - East side of investigation area, ~ 10' east of 22B

SAMPLE DESCRIPTION: Brown to light brown, silt, little to some clay, dark black-brown natural staining, moist

SAMPLE DEPTH INTERVAL: 1-3 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Horizontal Extent Sample - Asphalt @ surface - Barium duplicate sample also collected.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-21B-13-102294

DATE & TIME COLLECTED: 10/22/94 1240

SAMPLE LOCATION: 21B - Northeast portion of investigation area, ~ 24' north of 22B

SAMPLE DESCRIPTION: Light brown to brown silt, little clay, light gray mottles, moist.

SAMPLE DEPTH INTERVAL: 1-3 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe, Horizontal Extent sample - Asphalt @ surface - Barium duplicate sample also collected.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-16A-24-102294

DATE & TIME COLLECTED: 10/22/94 1250

SAMPLE LOCATION: 16A - Southcentral portion of investigation area, ~25' north of 43B

SAMPLE DESCRIPTION: Light brown to brown silt, little clay, moist

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Headspace Confirmation Sample -

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-8A-46-102294

DATE & TIME COLLECTED: 10/22/94 1340

SAMPLE LOCATION: 8A - Southwest portion of investigation area; Outside, east edge of Excavation 1

SAMPLE DESCRIPTION: Soft, light brown to brown silt, some clay, moist

SAMPLE DEPTH INTERVAL: 4-6 Ft

ANALYTICAL PARAMETERS: 8240 and Barium

COMMENTS: Collected via Geoprobe - Headspace confirmation sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR - BG1 - Ø2 - 102294

DATE & TIME COLLECTED: 10/22/94 1425

SAMPLE LOCATION: Grassy field south of investigation area

SAMPLE DESCRIPTION: Light brown, silt, trace clay, plant/grass roots, moist

SAMPLE DEPTH INTERVAL: 0-2 Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - Background sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BG1-24-102294

DATE & TIME COLLECTED: 10/22/94 1430

SAMPLE LOCATION: Grassy field south of investigation area

SAMPLE DESCRIPTION:

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - Background Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BG1-4b-102294

DATE & TIME COLLECTED: 10/22/94 1435

SAMPLE LOCATION: BG1 - grassy field south of investigation area.

SAMPLE DESCRIPTION:

SAMPLE DEPTH INTERVAL: 4-6 Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - Background sample.

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BG1-68-102294

DATE & TIME COLLECTED: 10/22/94 1440

SAMPLE LOCATION: BG-1 - Grassy field south of investigation area

SAMPLE DESCRIPTION:

SAMPLE DEPTH INTERVAL: 6-8 Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - Background Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BG2-Ø2-102294

DATE & TIME COLLECTED: 10/22/94 1450

SAMPLE LOCATION: BG-2 - Grassy field south of investigation area

SAMPLE DESCRIPTION:

SAMPLE DEPTH INTERVAL: Ø-2 Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - BACKGROUND Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BG2-24-102294

DATE & TIME COLLECTED: 10/22/94 1455

SAMPLE LOCATION: BG-2 - South of investigation area

SAMPLE DESCRIPTION:

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - Background Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BG2-46-102294

DATE & TIME COLLECTED: 10/22/94 1500

SAMPLE LOCATION: BG-2 - South of investigation area

SAMPLE DESCRIPTION:

SAMPLE DEPTH INTERVAL: 4-6 Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - Background Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BG2-68-102294

DATE & TIME COLLECTED: 10/22/94 1505

SAMPLE LOCATION: BG-2 - Grassy field South of Investigation area

SAMPLE DESCRIPTION:

SAMPLE DEPTH INTERVAL: 6-8' Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - Background Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BG3-Ø2-102294

DATE & TIME COLLECTED: 10/22/94 - 1510

SAMPLE LOCATION: BG-3 - Grassy field south of investigation area

SAMPLE DESCRIPTION:

SAMPLE DEPTH INTERVAL: Ø-2 Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - Background Sample

AWD
TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BG3-24-102294

DATE & TIME COLLECTED: 10/22/94 1515

SAMPLE LOCATION: BG-3 - Grassy field south of Investigation area

SAMPLE DESCRIPTION:

SAMPLE DEPTH INTERVAL: 2-4 Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - Background Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BG3-46-102294

DATE & TIME COLLECTED: 10/22/94 1520

SAMPLE LOCATION: BG-3 - Grassy field south of investigation area.

SAMPLE DESCRIPTION:

SAMPLE DEPTH INTERVAL: 4-6 Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - Background Sample

AWD TECHNOLOGIES

THE DOW CHEMICAL COMPANY
Hanging Rock Plant - Ironton, OH
Additional Sampling - Old Drum Storage Area
AWD Project No. 7015.600

SOIL SAMPLE COLLECTION LOG

SAMPLE IDENTIFICATION: DHR-BG3-6B-102294

DATE & TIME COLLECTED: 10/22/94 1525

SAMPLE LOCATION: BG3 - Grassy field South of Investigation area.

SAMPLE DESCRIPTION:

SAMPLE DEPTH INTERVAL: 6-8 Ft

ANALYTICAL PARAMETERS: Barium

COMMENTS: Collected via Geoprobe - Background Samples.

APPENDIX C

CHAIN-OF-CUSTODY

Analysis Request / Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2207694-14
2207774-9

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCER Quote #:
K. DODRILL
Name of state where samples were collected: OHIO

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Matrix: Soil	Matrix: Water (☐ Potable ☐ NPDES)	Matrix: Other	Total # of Containers	Analyses Requested: NO	Analyses Requested: 8270							Remarks	Temperature of samples upon receipt (if requested)
DHR-54C-13-102194	102194	1455	x		x			2	x	x								
DHR-54C-13DUP-102194	102194	1455	x		x			1	x									
DHR-54C-35-102194	102194	1505	x		x			2	x	x								
DHR-53D-57-102194	102194	1350	x		x			2	x	x							HOLD	
DHR-20C-68-102294	102294	1020	x		x			2	x	x							HOLD	
DHR-20C-46-102294	102294	1015	x		x			2	x	x								
DHR-20A-46-102294	102294	0920	x		x			2	x	x								
DHR-20B-02-102294	102294	0930	x		x			2	x	x								
DHR-20B-24-102294	102294	0935	x		x			2	x	x								
DHR-20A-46DUP-102294	102294	0920	x		x			2	x	x								

(7)
Turnaround Time Requested (TAT) (please circle): Normal Rush
(Rush TAT is subject to LLI approval and surcharge.) PER CONTRACT
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8)
Data Package Options (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/13/94	14:00			
Alvin Martinez	10/22/94	1600	FEDEX	10/24/94	1000
			K. Smith	10-25-94	0734

Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2207694-14
2207738-61
2207762-73

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS MCCOSKEY P.O.#
Sampler: D. MARTINCIK Quote #:
K. DODRILL
Name of state where samples were collected:

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (☐ Potable ☐ NPDES)	Other	Total # of Containers	VOC	8270							Remarks	Temperature of samples upon receipt (if required)
DHR-19A-24-102294	102294	0910	x		x			2	x	x								
DHR-20B-68-102294	102294	0945	x		x			2	x	x							HOLD	
DHR-20B-46-102294	102294	0940	x		x			2	x	x								
DHR-20C-02-102294	102294	0955	x		x			2	x	x								
(1) DHR-20C-02DUP-102294	102294	0955	x		x			2	x	x								
DHR-20C-24-102294	102294	1010	x		x			2	x	x								
DHR-20D-46-102294	102294	1045	x		x			2	x	x							HOLD	
DHR-20D-24-102294	102294	1040	x		x			2	x	x							HOLD	
DHR-20D-02-102294	102294	1030	x		x			2	x	x							HOLD	

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush PER CONTRACT
(Rush TAT is subject to LLI approval and surcharge.)
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)
Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/13/94	14:00			
[signature]	102294	1600	FEDEX	10/24/94	1000

Analysis Request / Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2207738-61
2207762-73

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCEK Quote #:
K. DODRILL
Name of state where samples were collected:

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water ☐ Potable ☐ NPDES	Other	Total # of Containers	Ba	8240						Remarks	Temperature of samples upon receipt (if requested)
DHR-23C-13DUP-102294	102294	1145	x		x			2	x	x							
DHR-23D-13-102294	102294	1200	x		x			2	x	x						HOLD	
DHR-22B-13-102294	102294	1215	x		x			2	x	x							
DHR-22B-13DUP-102294	102294	1215	x		x			2	x	x							
DHR-22C-13-102294	102294	1230	x		x			2	x	x						HOLD	
DHR-8A-46-102294	102294	1340	x		x			2	x	x							
DHR-21B-13-102294	102294	1240	x		x			2	x	x							
DHR-16A-24-102294	102294	1250	x		x			2	x	x							
DHR-21B-13DUP-102294	102294	1240	x		x			1	x								
DHR-22C-13DUP-102294	102294	1230	x		x			1	x							HOLD	

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush PER CONTRACT
(Rush TAT is subject to LLI approval and surchage.)
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/19/94	14:00			
[signature]	102294	1600	FEDEX	10/24/94	1000
			K. Smith	10-25-94	0934

2425 New Holland Pike, Lancaster, PA 17601-5994 (717) 656-2301 Copies: White and yellow should accompany samples to Lancaster Laboratories. The pink copy should be retained by the client 6/6/94 #2102

Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2207738-61
2207762-73

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCEK Quote #:
K. DODRILL
Name of state where samples were collected:

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (☐ Potable ☐ NPDES)	Other	Total # of Containers	Ba	8240							Remarks	Temperature of samples upon receipt (if requested)
DHR-20C-24MS-102294	102294	1010	x		x			1		x								
DHR-19A-24DUP-102294	102294	~~10~~ 0910	x		x			1		x								
DHR-20B-24DUP-102294	102294	0935	x		x			1		x								
DHR-20D-68-102294	102294	1055	x		x			2	x	x							HOLD	
DHR-16MSD-24-102294	102294	1110	x		x			3	x	x								
DHR-43B-02DUP-102294	102294	1105	x		x			2	x	x								
DHR-43B-02-102294	102294	1105	x		x			2	x	x								
DHR-43C-02-102294	102294	1100	x		x			2	x	x							HOLD	
DHR-23B-13-102294	102294	1130	x		x			2	x	x								
DHR-23C-13-102294	1145	1145	x		x			2	x	x								

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush PERCONTRACT
(Rush TAT is subject to LLI approval and surchage.)
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/19/94	14:00			
[signature]	102294	1600	FEDEX	10/24/94	1000
			K. Guite	10-25-94	0934

2425 New [illegible] Pike, Lancaster, PA 17601-5994 (717) 656-2301 Copies: White and yellow shoul[illegible]pany samples to Lancaster Laboratories. The pink copy should be retained by the client [illegible]/94 #2102

Analysis Request / Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2207714

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCEK, K. DODRILL Quote #:
Name of state where samples were collected: OHIO

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water ☐ Potable ☐ NPDES	Other	Total # of Containers	Ba	8240						Remarks	Temperature of Samples upon receipt (if requested)
DHR-17C-13-102194	102194	1730	x		x			2	x	x							
DHR-17B-13-102194	102194	1715	x		x			2	x	x							
DHR-52A-24-102194	102194	1650	x		x			2	x	x							
DHR-54B-57-102194	102194	1545	x		x			2	x	x							
DHR-48A-24-102194	102194	1705	x		x			2	x	x							
DHR-54C-57-102194	102194	1510	x		x			2	x	x							
DHR-55A-24-102194	102194	1635	x		x			2	x	x							
DHR-54A-46-102194	102194	1615	x		x			2	x	x							
DHR-54A-24-102194	102194	1610	x		x			2	x	x						[redacted]	
DHR-54B-13-102194	102194	1530	x		x			2	x	x							

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush
(Rush TAT is subject to LLI approval and surchage.) PER CONTRACT
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/13/94	14:00			
[signature]	102294		FEDEX	10/24/94	1000
			[signature]	10/25/94	0934

Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2206890 - 909
2206930-31

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES INC Acct. #: 6948
Project Name/#: TRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCIK Quote #:
K. DODRILL
Name of state where samples were collected: OHIO

For LLI use only
FSC:
SCR #: 10062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (☐ Potable ☐ NPDES)	Other	Total # of Containers	BG	8240							Remarks	Temperature of samples upon receipt (if requested)
DHR-53C-91-102194	102194	1215	x		x				x	x								
DHR-53C-79-102194	102194	1205	x		x				x	x								
DHR-53B-79-102194	102194	1100	x		x				x	x								
DHR-53B-57-102194	102194	1055	x		x				x	x								
DHR-53B-35-102194	102194	1015	x		x				x	x								
DHR-53C-57-102194	102194	1115	x		x				x	x								
DHR-53C-13-102194	102194	1120	x		x				x	x								
DHR-53B-13-102194	102194	1011	x		x				x	x								
DHR-53A-24-102194	102194	0930	x		x				x	x								
DHR-53A-46-102194	102194	0935	x		x				x	x								

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush
(Rush TAT is subject to LLI approval and surcharge.)
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/19/94	14:00			
K. Dodrill	102194	16:10	FED EX		
			K. M.	10/20/94	0912

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)
Internal Chain of Custody required? Yes No

Analysis Request / Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2206890-909
2206930-31

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES INC Acct. #: 6948
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McKOSKI P.O.#
Sampler: D. MARTINCEK / K. DODRILL Quote #:
Name of state where samples were collected: OHIO

For LLI use only
FSC:
SCR #: 1062250

(2) Sample Identification	Date Collected	Time Collected	(3) Grab	Composite	Matrix (4) Soil	Water (☐ Potable ☐ NPDES)	Other	Total # of Containers	(5) Analyses Requested: BS	8240							Remarks	(6) Temperature of samples upon receipt (if requested)
DHR-53C-35-102194	102194	1145	x		x				x	x								
~~DHR-53C-9H-102194~~	~~102194~~	~~1215~~	~~x~~		~~x~~					~~x~~								
DHR-51A-24-102094	102094	1730	x		x				x	x								
DHR-49A-24-102094	102094	1630	x		x				x	x								
DHR-51A-46-102094	102094	1740	x		x				x	x								
✓ DHR-8B-46-102094	102094	1155	x		x				x	x							HOLD	
DHR-49A-46-102094	102094	1620	x		x				x	x								
DHR-11A-46-102094	102094	1410	x		x				x	x								
DHR-11A-24-102094	102094	1355	x		x				x	x								
DHR-8B-68-102094	102094	1205	x		x				x	x							HOLD	

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush
(Rush TAT is subject to LLI approval and surcharge.)
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)
Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/18/94	14:00			
K. Dodrill	102194	1640	FED EX		
			K. [illegible]	10/21/94	0912

Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2206890-909

2206930-31

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #: 6948
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCEK K. DODRILL Quote #:
Name of state where samples were collected:

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (☐ Potable ☐ NPDES)	Other	Total # of Containers	Ba	8240							Remarks	Temperature of samples upon receipt (if requested)
DHR-8B-02-102094	102094	1145	x		x				x	x							HOLD	
DHR-8B-24-102094	102094	1215	x		x				x	x							HOLD	
DHR-8C-46-102094	102094	1020	x		x				x	x								
DHR-8D-46-102094	102094	0945	x		x				x	x							HOLD	
DHR-8C-24-102094	102094	1010	x		x				x	x								
DHR-46A-24-102094	102094	1455	x		x				x	x								
DHR-8C-02-102094	102094	1000	x		x				x	x								
DHR-8D-68-102094	102094	0955	x		x				x	x							HOLD	
DHR-8C-68-102094	102094	1040	x		x				x	x							HOLD	
DHR-53C-13DUP-102194	102194	1120	x		x					x								

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush
(Rush TAT is subject to LLI approval and surchage.)
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/13/94	1400			
K. Dodrill	102194	1640	FEDEX		
			K. Gunton	10-24-94	0912

AWD TECHNOLOGIES

CHAIN-OF-CUSTODY RECORD

PROJECT NO.: 7015.600

PROJECT NAME: Dow-Hanging Rock

SAMPLERS (PRINT): DNM

SAMPLERS (SIGNATURE): [signature]

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE TYPE	SAMPLE ~~LOCATION~~ ID	NO. OF CONTAINERS	8240	BARIUM					REMARKS
8D	10/20/94	0935		✓	Soil	DHR-8D-02-102094	2	X	X					HOLD
8D	10/20/94	0940		✓	Soil	DHR-8D-24-102094	2	X	X					HOLD
46A	10/20/94	1445		✓	Soil	DHR-46A-26-102094	2	X	X					

RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):
[signature]	10/21/94 1640	FEDEX			
RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED FOR LABORATORY BY (SIGNATURE):	REMARKS:		
	10/24/94 0912	Deborah Ahlslund			

Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2207694-714

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCEK Quote #:
K. DODRILL
Name of state where samples were collected: OHIO

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (☐ Potable ☐ NPDES)	Other	Total # of Containers	Ba	8240							Remarks	Temperature of samples upon receipt (if requested)
DHR-54B-35-102194	102194	1540	x		x			2	x	x								
DHR-54B-79-102194	102194	1550	x		x			2	x	x							HOLD	
DHR-53D-79-102194	102194	1400	x		x			2	x	x							HOLD	
DHR-53D-13-102194	102194	1340	x		x			2	x	x							HOLD	
DHR-54D-35-102194	102194	1420	x		x			2	x	x							HOLD	
DHR-54D-13-102194	102194	1415	x		x			2	x	x							HOLD	
DHR-54C-79-102194	102194	1515	x		x			2	x	x							HOLD	
DHR-54D-79-102194	102194	1435	x		x			2	x	x							HOLD	
DHR-53D-35-102194	102194	1345	x		x			2	x	x							HOLD	
DHR-54D-57-102194	102194	1430	x		x			2	x	x							HOLD	

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush PER CONTRACT
(Rush TAT is subject to LLI approval and surchage.)
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 7882717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/13/94	1450			
[signature]	10/22/94	1600	FEDEX	10/24/94	1000
			K. [signature]	10-25-94	0934

(9)

2425 New Pike, Lancaster, PA 17601-5994 (717) 656-2301 Copies: White and yellow shoul ...pany samples to Lancaster Laboratories. The pink copy should be retained by the client ...5/94 #2102

Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2267738-61

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCEK Quote #:
Name of state where samples were collected:

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (☐ Potable ☐ NPDES)	Other	Total # of Containers	Ba							Remarks	Temperature of samples upon receipt (if requested)
DHR-BG1-02-102294	102294	1425	x		x			1	x							SAMPLE TUBES	
DHR-BG1-24-102294	102294	1430	x		x			1	x							"	
DHR-BG1-46-102294	102294	1435	x		x			1	x							"	
DHR-BG1-68-102294	102294	1440	x		x			1	x							"	
DHR-BG2-02-102294	102294	1450	x		x			1	x							"	
DHR-BG2-24-102294	102294	1455	x		x			1	x							"	
DHR-BG2-46-102294	102294	1500	x		x			1	x							"	
DHR-BG2-68-102294	102294	1505	x		x			1	x							"	
DHR-BG3-02-102294	102294	1510	x		x			1	x							"	
DHR-BG3-24-102294	102294	1515	x		x			1	x							"	

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush
(Rush TAT is subject to LLI approval and surchage.) PER CONTRACT
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412-788-2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Oel.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/13/94	14:00			
[signature]	102294	1600	FEDEX	10/24/94	1000
			[signature]	10-25-94	0934

Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2209738-61

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCEK Quote #:
Name of state where samples were collected:

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (☐ Potable ☐ NPDES)	Other	Total # of Containers	Ba	82-10							Remarks	Temperature of Samples upon receipt (if requested)
DHR-B63-46-102294	102294	1520	x		x			1	x								Sample Tube	
DHR-B63-68-102294	102294	1525	x		x			1	x								"	
DHR-FBLANK1-102294	102294	1630	x			x		4	x	x								
~~BH~~																		

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush
(Rush TAT is subject to LLI approval and surchage.) PER CONTRACT
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/13/94	14:00			
[signature]	102294	1640	FEDEX	10/24/94	1000
			K [signature]	10-25-94	09:34

APPENDIX D

DATA VALIDATION LETTERS

AWD TECHNOLOGIES

A Subsidiary of
The Dow Chemical Company

PGH-94-CDY-1257

DATE January 10, 1995

TO Mr. Kristian Macoskey
Dow Environmental, Inc.
Penn Center West, Building 3, Suite 300
Pittsburgh, Pennsylvania

FROM Cheryl Young
Dow Environmental, Inc.

SUBJECT Data Validation of:
Volatile Organic Chemicals and Barium

Re: The Dow Chemical Company
Dow Hanging Rock - Ironton, Ohio

Lancaster Laboratories Sample Numbers 2206890-2206909

SDG#: IRN01

Samples:

DHR-8C-46-102094	DHR-53B-35-102194
DHR-8C-24-102094	DHR-53C-57-102194
DHR-46A-24-102094	DHR-53B-13-102194
DHR-8C-02-102094	DHR-53A-24-102194
DHR-53C-13-102194	DHR-53A-46-102194
DHR-53C-13DUP-102194	DHR-53C-35-102194
DHR-53C-91-102194	DHR-51A-24-102094
DHR-53C-79-102194	DHR-49A-24-102094
DHR-53B-79-102194	DHR-51A-46-102094
DHR-53B-57-102194	DHR-49A-46-102094

Field Duplicates: Sample DHR-53C-13DUP-102194 is a field duplicate of sample DHR-53C-13-102194.

Overview

This set of samples collected on October 20 and 21, 1994 contains twenty (20) soil samples, including one field duplicate pair. Samples were analyzed for volatile organic chemicals by U.S. EPA SW-846 Method 8240A and Barium using Method 6010A. The percent moisture was determined by using modified Method 160.3 for each environmental sample.

Summary

All compounds were successfully analyzed in all samples. The organic analytical data were evaluated by the following quality assurance/quality control (QA/QC) parameters where applicable: holding times, initial and continuing calibrations, system monitoring compound/surrogate spike recoveries, method blanks, field duplicates, matrix spike/matrix spike duplicates (MS/MSDs), analytical sequence, compound identification and quantitation, and transcription. Validated sample analysis results are listed on the attached data summary form. Areas of concern with respect to data quality and usability are discussed below.

The inorganic analytical data were evaluated by the following QA/QC parameters where applicable: technical holding times and preservation, laboratory blanks, matrix spike recoveries, laboratory duplicates, laboratory control samples, field QC, and transcription. The data are described in the following sections according to the method of analysis and the compliance of the QA/QC information reported in the data package. Validated sample analysis results are listed on the attached data summary form. Areas of concern with respect to data quality and usability are discussed below.

Minor Issues

Blank contamination of barium was identified in laboratory blanks. All barium results were greater than five times the greatest amount of contamination. Therefore, qualification was not indicated.

Surrogate recoveries were greater than quality control limits in samples DHR-53B-79-102194 and DHR-53B-57-102194. All associated results greater than the CRQL were qualified "J", estimated. Associated results less than the CRQL were not qualified.

Surrogate recoveries were less than quality control limits in samples DHR-51A-46-102094 and the dilution of sample DHR-53A-46-102194. Positive associated results were qualified "J", estimated. Non-detected associated results were qualified "UJ", estimated. Please note that only the ethylbenzene and styrene results are affected in sample DHR-53A-46-102194.

The percent recoveries (%Rs) and the relative percent differences (RPDs) of ethylbenzene and styrene were outside of quality control limits in matrix spike/matrix spike duplicate samples. Associated data were not qualified because qualification of data is not based on MS/MSD criteria alone.

Comparisons of the field duplicate pair DHR-53C-13-102194 and DHR-53C-13Dup-102194 were outside of quality control limits for ethylbenzene and styrene. Associated results were qualified "J", estimated.

Notes

Please note that results for sample dilutions have been reported on the analysis reports produced by the laboratory.

Samples DHR-53C-91-102194 and DHR-53B-79-102194 were diluted (1:10) for the volatile analysis.

Sample DHR-53C-79-102194 was diluted (1:10 and 1:20) for the volatile analysis.

Sample DHR-53B-35-102194 was diluted (1:50) for the volatile analysis.

Sample DHR-49A-46-102094 was diluted (1:4) for the volatile analysis.

The laboratory reported that the medium soil method was used for samples DHR-53C-911-102194, DHR-53C-79-102194, DHR-53B-79-102194, DHR-53B-57-102194, DHR-51A-46-102094, and DHR-49A-46-102094 due to the high level of target compounds. The quantitation limits were raised accordingly.

The laboratory reported that quantitation limits for DHR-53A-46-102194 were raised due to the dilution needed to bring target compounds into the calibration of the system.

The laboratory reported that a second ion quantitation was performed on 4-bromofluorobenzene in DHR-53C-91-102194 and DHR-53B-57-102194 by using m/z 174 instead of m/z 95 due to interference with the primary ion.

Information Regarding Report Content

Attachments:

1. Glossary of data qualifier codes.
2. Data Summary. This may include:
   a) All positive results with qualifier codes, if applicable.
   b) All estimated detection limits qualified with UJ.
3. Appendix A - Results as Reported by the Laboratory.
4. Appendix B - Support Documentation includes details to support the statements made in this report.

GLOSSARY OF DATA QUALIFIER CODES

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds)

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. The result is unusable.

CODES RELATED TO QUANTITATION

(can be used for positive results and sample quantitation limits)

J = Analyte present. Reported value may not be accurate or precise.

UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

DATA SUMMARY

DOW ENVIRONMENTAL, INC.

DOW-HANGING ROCK

IRONTON - GRAB SOIL SAMPLES / SDG# IRND1

DATA SUMMARY

COMPOUND	DHR-8C-46-102094	DHR-8C-24-102094	DHR-46A-24-102094	DHR-8C-02-102094	DHR-53C-91-102194	DHR-53C-79-102194	DHR-53B-79-102194
Acrylonitrile (ug/kg)	< 130	< 120	< 120	< 110	< 170,000	< 160,000	< 160,000
Methylene Chloride (ug/kg)	< 6	< 6	< 6	< 6	< 8,100	< 7,900	< 7,900
Ethylbenzene (ug/kg)	< 6	< 6	23	< 6	170,000	520,000	210,000 J
Styrene (ug/kg)	< 6	< 6	14	< 6	54,000	200,000	81,000 J
Barium (mg/kg)	105	124	73	157	129	160	117
Moisture (% by wt.)	21.5	16.8	17	12.2	22	19.9	19.8

COMPOUND	DHR-53B-57-102194	DHR-53B-35-102194	DHR-53C-57-102194	DHR-53C-13-102194	DHR-53C-13DUP-102194	DHR-53B-13-102194	DHR-53A-24-102194
Acrylonitrile (ug/kg)	< 670,000	< 120	< 120	< 120	< 120	< 120	< 120
Methylene Chloride (ug/kg)	< 33,000	< 6	6	< 6	< 6	< 6	< 6
Ethylbenzene (ug/kg)	1,400,000 J	33	400	44 J	16 J	76	10
Styrene (ug/kg)	950,000 J	38	540	110 J	38 J	88	< 6
Barium (mg/kg)	89	56	313	89	74	66	155
Moisture (% by wt.)	5.6	17.6	17.9	16	16.5	17.9	17.4

COMPOUND	DHR-53A-46-102194	DHR-53C-35-102194	DHR-51A-24-102094	DHR-49A-24-102094	DHR-51A-46-102094	DHR-49A-46-102094
Acrylonitrile (ug/kg)	< 620	< 120	< 16,000	< 120	< 16,000 UJ	< 55,000
Methylene Chloride (ug/kg)	< 31	< 6	< 760	< 6	< 780 UJ	< 2,700
Ethylbenzene (ug/kg)	2,200 J	160	17,000	550	22,000 J	99,000
Styrene (ug/kg)	3,400 J	280	7,600	350	12,000 J	60,000
Barium (mg/kg)	120	83	69	118	95	100
Moisture (% by wt.)	19.7	16.5	17.1	19.6	18.9	9

APPENDIX A

RESULTS AS REPORTED BY THE LABORATORY

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206890
Collected: 10/20/94 at 10:20 by OM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8C-46-102094 Grab Soil Sample
Ironton

8C-46 SDG#: IRN01-01

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	82.1	9.8	mg/kg	105.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	21.5	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:30:55 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206890
Collected: 10/20/94 at 10:20 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8C-46-102094 Grab Soil Sample
Ironton

8C-46 SDG#: IRN01-01

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 130.	130.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

...nation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206891
Collected: 10/20/94 at 10:10 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8C-24-102094 Grab Soil Sample
Ironton

8C-24 SDG#: IRN01-02

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	103.	9.9	mg/kg	124.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	16.8	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:31:07 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206891
Collected: 10/20/94 at 10:10 by OM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BC-24-102094 Grab Soil Sample
Ironton

BC-24 SOG#: IRN01-02

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206892
Collected: 10/20/94 at 14:55 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-46A-24-102094 Grab Soil Sample
Ironton

46A24 SDG#: IRN01-03

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	60.6	9.9	mg/kg	73.	12.
9001	Styrene	12.	5.	ug/kg	14.	6.
0111	Moisture	17.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Oata Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:31:19 D 0002 20 0 118283 440216
603 25.00 00D33600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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Where quality is a science.

LLI Sample No. SW 2206892
Collected: 10/20/94 at 14:55 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-46A-24-102094 Grab Soil Sample
Ironton

46A24 SDG#: IRN01-03

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	19.	5.	ug/kg	23.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Explanation of Symbols and Abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206893
Collected: 10/20/94 at 10:00 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8C-02-102094 Grab Soil Sample
Ironton

8C-02 SDG#: IRN01-04

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	138.	10.	mg/kg	157.	11.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	12.2	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:31:29 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See ... for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206893
Collected: 10/20/94 at 10:00 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8C-02-102094 Grab Soil Sample
Ironton

8C-02 SDG#: IRN01-04

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 110.	110.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206894
Collected: 10/21/94 at 11:20 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-13DUP-102194 Grab Soil Sample
Ironton

53C13 SDG#: IRN01-05

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT No.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
77	Purgeables (SW846/8240A)			See Page 2		
5	Barium	62.	10.	mg/kg	74.	12.
71	Styrene	32.	5.	ug/kg	38.	6.
111	Moisture	16.5	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
D4:31:40 D 0002 20 0 118283 440216
603 25.80 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206894
Collected: 10/21/94 at 11:20 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-13DUP-102194 Grab Soil Sample
Ironton

53C13 SDG#: IRN01-05

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	13.	5.	ug/kg	16.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206895
Collected: 10/21/94 at 12:15 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-911-102194 Grab Soil Sample
Ironton

53C91 SDG#: IRN01-06

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	101.	9.5	mg/kg	129.	12.
9001	Styrene	42,000.	6,300.	ug/kg	54,000.	8,100.
0111	Moisture	22.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:31:51 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Explanation of symbols and abbreviations

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LLI Sample No. SW 2206895
Collected: 10/21/94 at 12:15 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-911-102194 Grab Soil Sample
Ironton

53C91 SDG#: IRN01-06

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 130,000.	130,000.	ug/kg	< 170,000.	170,000.
3440	Methylene Chloride	< 6,300.	6,300.	ug/kg	< 8,100.	8,100.
3458	Ethylbenzene	130,000.	6,300.	ug/kg	170,000.	8,100.

The GC/MS volatile analysis was performed according to the medium level soil method due to the level of target compounds. The quantitation limits were therefore raised.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

36

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206896
Collected: 10/21/94 at 12:05 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-79-102194 Grab Soil Sample
Ironton

53C79 SDG#: IRN01-07

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	12B.	9.5	mg/kg	160.	12.
9001	Styrene	160,000.	6,300.	ug/kg	200,000.	7,900.
0111	Moisture	19.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:32:02 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

explanation of symbols and abbreviations

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LLI Sample No. SW 2206896
Collected: 10/21/94 at 12:05 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-79-102194 Grab Soil Sample
Ironton

53C79 SDG#: IRN01-07

Account No: 06948
AWD Technologies, Inc.
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Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 130,000.	130,000.	ug/kg	< 160,000.	160,000.
3440	Methylene Chloride	< 6,300.	6,300.	ug/kg	< 7,900.	7,900.
3458	Ethylbenzene	420,000.	6,300.	ug/kg	520,000.	7,900.

The GC/MS volatile analysis was performed according to the medium level soil method due to the level of target compounds. The quantitation limits were therefore raised.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

...explanation of symbols and abbreviations

Analysis Report

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LLI Sample No. SW 2206897
Collected: 10/21/94 at 11:00 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-538-79-102194 Grab Soil Sample
Ironton

53B79 SDG#: IRN01-08

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	94.1	9.7	mg/kg	117.	12.
9001	Styrene	65,000.	6,300.	ug/kg	81,000.	7,900.
0111	Moisture	19.8	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:32:12 D 0002 20 0 118283 440216
603 25.00 0D033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2206897
Collected: 10/21/94 at 11:00 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53B-79-102194 Grab Soil Sample
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53B79 SDG#: IRN01-08

Account No: 06948
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Pittsburgh, PA 15276

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Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 130,000.	130,000.	ug/kg	< 160,000.	160,000.
3440	Methylene Chloride	< 6,300.	6,300.	ug/kg	< 7,900.	7,900.
3458	Ethylbenzene	170,000.	6,300.	ug/kg	210,000.	7,900.

The GC/MS volatile analysis was performed according to the medium level soil method due to the level of target compounds. The quantitation limits were therefore raised.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206898
Collected: 10/21/94 at 10:55 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53B-57-102194 Grab Soil Sample
Ironton

53B57 SDG#: IRN01-09

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	84.4	9.7	mg/kg	89.	10.
9001	Styrene	900,000.	31,000.	ug/kg	950,000.	33,000.
0111	Moisture	5.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:32:23 D 00D2 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

... explanation of symbols and abbreviations

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LLI Sample No. SW 2206898
Collected: 10/21/94 at 10:55 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53B-57-102194 Grab Soil Sample
Ironton

53B57 SDG#: IRN01-09

Account No: 06948
AWD Technologies, Inc.
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Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 630,000.	630,000.	ug/kg	< 670,000.	670,000.
3440	Methylene Chloride	< 31,000.	31,000.	ug/kg	< 33,000.	33,000.
3458	Ethylbenzene	1,300,000.	31,000.	ug/kg	1,400,000.	33,000.

Poor surrogate recoveries were observed for the GC/MS volatile fraction due to the dilution needed to perform the analysis.

The GC/MS volatile analysis was performed according to the medium level soil method due to the level of target compounds. The quantitation limits were therefore raised.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Explanation of symbols and abbreviations

Analysis Report

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LLI Sample No. SW 2206899
Collected: 10/21/94 at 10:15 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53B-35-102194 Grab Soil Sample
Ironton

53835 SOG#: IRN01-10

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Pittsburgh, PA 15276

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CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	46.0	9.8	mg/kg	56.	12.
9001	Styrene	31.	5.	ug/kg	38.	6.
0111	Moisture	17.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:32:34 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Explanation of symbols and abbreviations

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LLI Sample No. SW 2206899
Collected: 10/21/94 at 10:15 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53B-35-102194 Grab Soil Sample
Ironton

53835 SDG#: IRN01-10

Account No: 06948
AWD Technologies, Inc.
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Pittsburgh, PA 15276

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Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	27.	5.	ug/kg	33.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Analysis Report

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LLI Sample No. SW 2206900
Collected: 10/21/94 at 11:15 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-57-102194 Grab Soil Sample
Ironton

53C57 SDG#: IRN01-11

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Pittsburgh, PA 15276

P.O. SC-94-1061-COM
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CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	257.	9.8	mg/kg	313.	12.
9001	Styrene	440.	5.	ug/kg	540.	6.
0111	Moisture	17.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
D4:32:44 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

4J

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Explanation of symbols and abbreviations

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LLI Sample No. SW 2206900
Collected: 10/21/94 at 11:15 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-57-102194 Grab Soil Sample
Ironton

53C57 SDG#: IRN01-11

Account No: 06948
AWD Technologies, Inc.
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Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	5.	5.	ug/kg	6.	6.
3458	Ethylbenzene	330.	5.	ug/kg	400.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

for an explanation of symbols and abbreviations

Analysis Report

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LLI Sample No. SW 2206901
Collected: 10/21/94 at 11:20 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-13-102194 Grab Soil Sample
Ironton

C1310 SDG#: IRN01-12

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	74.	10.	mg/kg	89.	12.
9001	Styrene	91.	5.	ug/kg	110.	6.
D111	Moisture	16.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:32:54 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See explanation of symbols and abbreviations

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LLI Sample No. SW 2206901
Collected: 10/21/94 at 11:20 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-13-102194 Grab Soil Sample
Ironton

C1310 SDG#: IRN01-12

Account No: 06948
AWD Technologies, Inc.
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Pittsburgh, PA 15276

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Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	37.	5.	ug/kg	44.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Explanation of Symbols and Abbreviations

Analysis Report

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LLI Sample No. SW 2206902
Collected: 10/21/94 at 10:11 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53B-13-102194 Grab Soil Sample
Ironton

53B13 SDG#: IRN01-13

Account No: 06948
AWD Technologies, Inc.
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Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	53.9	9.9	mg/kg	66.	12.
9001	Styrene	72.	5.	ug/kg	88.	6.
0111	Moisture	17.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
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04:33:04 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

49

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-3994
717-656-2301

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LLI Sample No. SW 2206902
Collected: 10/21/94 at 10:11 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-538-13-102194 Grab Soil Sample
Ironton

53B13 SDG#: IRN01-13

Account No: 06948
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Pittsburgh, PA 15276

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CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	62.	5.	ug/kg	76.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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Analysis Report

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LLI Sample No. SW 2206903
Collected: 10/21/94 at 09:30 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53A-24-102194 Grab Soil Sample
Ironton

53A24 SDG#: IRN01-14

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	128.	9.9	mg/kg	155.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	17.4	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
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04:33:14 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster PA 17601-5994
717-656-2301

For explanation of symbols see ...

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LLI Sample No. SW 2206903
Collected: 10/21/94 at 09:30 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53A-24-102194 Grab Soil Sample
Ironton

53A24 SDG#: IRN01-14

Account No: 06948
AWD Technologies, Inc.
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Pittsburgh, PA 15276

P.O. SC-94-1061-COM
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CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	8.	5.	ug/kg	10.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

For explanation of symbols and abbreviations

Analysis Report

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LLI Sample No. SW 2206904
Collected: 10/21/94 at 09:35 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53A-46-1D2194 Grab Soil Sample
Ironton

53A46 SDG#: IRN01-15

Account No: 06948
AWD Technologies, Inc.
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Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	96.7	9.8	mg/kg	120.	12.
90D1	Styrene	2,700.	25.	ug/kg	3,400.	31.
0111	Moisture	19.7	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:33:25 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

For explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206904
Collected: 10/21/94 at 09:35 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53A-46-102194 Grab Soil Sample
Ironton

53A46 SDG#: IRN01-15

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 500.	500.	ug/kg	< 620.	620.
3440	Methylene Chloride	< 25.	25.	ug/kg	< 31.	31.
3458	Ethylbenzene	1,800.	25.	ug/kg	2,200.	31.

The quantitation limits for the GC/MS volatile compounds were raised because sample dilution was necessary to bring target compounds into the calibration range of the system.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories Inc
2425 New Holland Pike
Lancaster PA 17601-5994
717-656-2301

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206905
Collected: 10/21/94 at 11:45 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-35-102194 Grab Soil Sample
Ironton

53C35 SDG#: IRN01-16

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	69.3	9.7	mg/kg	83.	12.
9001	Styrene	230.	5.	ug/kg	280.	6.
0111	Moisture	16.5	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:33:35 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206905
Collected: 10/21/94 at 11:45 by OM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53C-35-102194 Grab Soil Sample
Ironton

53C35 SDG#: IRN01-16

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	130.	5.	ug/kg	160.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Explanation of Symbols and Abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206906
Collected: 10/20/94 at 17:30 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-51A-24-102094 Grab Soil Sample
Ironton

51A24 SDG#: IRN01-17

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	57.1	9.9	mg/kg	69.	12.
9001	Styrene	6,300.	630.	ug/kg	7,600.	760.
0111	Moisture	17.1	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:33:46 D 0002 20 0 118283 44D216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster PA 17601-5994
717-656-2301

Explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206906
Collected: 10/20/94 at 17:30 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-51A-24-102094 Grab Soil Sample
Ironton

51A24 SDG#: IRN01-17

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 13,000.	13,000.	ug/kg	< 16,000.	16,000.
3440	Methylene Chloride	< 630.	630.	ug/kg	< 760.	760.
3458	Ethylbenzene	14,000.	630.	ug/kg	17,000.	760.

The GC/MS volatile analysis was performed according to the medium level soil method due to the level of target compounds. The quantitation limits were therefore raised.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206907
Collected: 10/20/94 at 16:30 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-49A-24-102094 Grab Soil Sample
Ironton

49A24 SDG#: IRN01-18

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	94.8	9.7	mg/kg	118.	12.
9001	Styrene	280.	5.	ug/kg	350.	6.
D111	Moisture	19.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:33:56 D 0002 20 0 118283 440216
603 25.00 D0033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster PA 17601-5994
717-656-2301

Explanation of symbols and abbreviations

Lancaster Laboratories
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LLI Sample No. SW 2206907
Collected: 10/20/94 at 16:30 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-49A-24-102094 Grab Soil Sample
Ironton

49A24 SDG#: IRN01-18

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	440.	5.	ug/kg	550.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206908
Collected: 10/20/94 at 17:40 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-51A-46-102094 Grab Soil Sample
Ironton

51A46 SDG#: IRNO1-19

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	77.	10.	mg/kg	95.	12.
9001	Styrene	10,000.	630.	ug/kg	12,000.	780.
0111	Moisture	18.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:34:06 D 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
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LLI Sample No. SW 2206908
Collected: 10/20/94 at 17:40 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-51A-46-102094 Grab Soil Sample
Ironton

51A46 SDG#: IRN01-19

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 13,000.	13,000.	ug/kg	< 16,000.	16,000.
3440	Methylene Chloride	< 630.	630.	ug/kg	< 780.	780.
3458	Ethylbenzene	18,000.	630.	ug/kg	22,000.	780.

The GC/MS volatile analysis was performed according to the medium level soil method due to the level of target compounds. The quantitation limits were therefore raised.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

Explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206909
Collected: 10/20/94 at 16:20 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-49A-46-102094 Grab Soil Sample
Ironton

49A46 SDG#: IRN01-20*

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	90.9	9.7	mg/kg	100.	11.
9001	Styrene	55,000.	2,500.	ug/kg	60,000.	2,700.
0111	Moisture	9.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:34:18 0 0002 20 0 118283 440216
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

explanation of symbols and abbreviations

Lancaster Laboratories
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LLI Sample No. SW 2206909
Collected: 10/20/94 at 16:20 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-49A-46-102094 Grab Soil Sample
Ironton

49A46 SDG#: IRN01-20*

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 50,000.	50,000.	ug/kg	< 55,000.	55,000.
3440	Methylene Chloride	< 2,500.	2,500.	ug/kg	< 2,700.	2,700.
3458	Ethylbenzene	90,000.	2,500.	ug/kg	99,000.	2,700.

The GC/MS volatile analysis was performed according to the medium level soil method due to the level of target compounds. The quantitation limits were therefore raised.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

...ination of symbols and abbreviations

APPENDIX B

SUPPORT DOCUMENTATION

QUALITY ASSURANCE SUMMARY

BLANKS

Lab Name: LANCASTER_LABORATORIES___

SDG No.: IRN01

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Barium	12.3	B	4.8	B	5.4	B	1.9	U			P

QUALITY ASSURANCE SUMMARY

BLANKS

Lab Name: LANCASTER_LABORATORIES___

SDG No.: IRN01

Preparation Blank Matrix (soil/water): _SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Barium			1.9	U					0.681	B	P

QUALITY ASSURANCE SUMMARY

BLANKS

Lab Name: LANCASTER_LABORATORIES___

SDG No.: IRN01

Preparation Blank Matrix (soil/water): _SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Barium			1.9	U					0.681	B	P

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Where quality is a science.

SOIL VOLATILE SURROGATE RECOVERY

2B

LAB NAME: LANCASTER LABS SDG No: IRN01

LEVEL:MED

	EPA SAMPLE NO.	S1 (DCE) #	S2 (TOL) #	S3 (BFB) #	OTHER	TOT OUT
01	53C91	92	92	102		
02	53C79	97	92	98		
03	53C79DL	97	88	92		
04	53B79	91	86	116		
05	53B57	88	102	169 D		
06	53A46DL	84	83	91		
07	53A46DLMS	90	92	90		
08	53A46DLMSD	99	104	100		
09	51A24	94	91	99		
10	51A46	80	83	89		
11	49A46	86	92	104		
12						
13	LAB QC					
14	VBLKH81	96	95	95		
15	VBLKH10	101	97	101		
16	VBLKH14	107	101	99		
17	VBLKH15	90	94	93		
18	LCSMH04	99	103	105		
19						
20						
21						
22						
23						
24						
25						

				QC LIMITS
S1	(DCE)	=	1,2-Dichloroethane-d4	70 - 121
S2	(TOL)	=	Toluene-d8	84 ~~81~~ - ~~117~~ 138
S3	(BFB)	=	4-Bromofluorobenzene	59 ~~74~~ - ~~121~~ 113

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

FORM II VOA-2

1/87 Rev.
Modified

Lancaster Laboratories, Inc. • 2425 New Holland Pike, Lancaster, PA 17601-5994 • 717.656.2301 • Fax: 717.656.2681

Lancaster Laboratories, Inc.
GC/MS Volatiles Matrix Spike/Spike Duplicate Recoveries

Unspiked: ^HCR16
53A46DL 2206904
Method: 1177 +SPECIALS
Instrument: HP03974

Matrix spike: ^HN306
53A46DLMS 2206904
Matrix/Level: SM
Dilution Factor: 1.0

Spike Duplicate: ^HN307
53A46DLMSD2206904
Batch: H942992AB
% Moisture: 20

COMPOUND NAME	SPIKE LEVEL	US CONC UG/KG	MS CONC UG/KG	MSD CONC UG/KG	MS REC %	MSD REC %	RPD %	RANGE LOWER-UPPER	IN SPEC
Chloromethane	3125.00	0.00	5240.76	1684.53	168	54	103	1-273	YES
Vinyl Chloride	3125.00	0.00	5982.91	2132.35	191	68	95	1-251	YES
Bromomethane	3125.00	0.00	6029.40	2569.64	193	82	81	1-242	YES
Chloroethane	3125.00	0.00	5869.83	2194.70	188	70	91	14-230	YES
Trichlorofluoromethane	3125.00	0.00	4695.47	3519.79	150	113	28	17-181	YES
Acrolein	23437.50	0.00	10982.64	6144.31	47	26	58	22-169	YES
1,1-Dichloroethene	3125.00	0.00	2840.00	2627.12	91	84	8	1-234	YES
Acetone	23437.50	0.00	22143.39	21323.87	94	91	3	19-150	YES
Carbon Disulfide	23437.50	0.00	33067.30	28791.73	141	123	14	29-183	YES
Methylene Chloride	3125.00	0.00	4117.27	3986.74	132	128	3	1-221	YES
Acrylonitrile	23437.50	0.00	22158.54	21771.01	94	93	1	51-138	YES
1,1-Dichloroethane	3125.00	0.00	3075.61	2967.60	98	95	3	59-155	YES
1,2-Dichloroethene (total)	6250.00	0.00	6755.89	6702.04	108	107	1	54-156	YES
2-Butanone	23437.50	0.00	25688.13	25875.87	110	110	0	22-167	YES
Chloroform	3125.00	0.00	3019.45	3122.58	97	100	-3	51-138	YES
1,2-Dichloroethane	3125.00	0.00	2942.18	2967.35	94	95	-1	49-155	YES
Vinyl Acetate	15625.00	0.00	15306.76	17353.33	98	111	-12	19-190	YES
1,1,1-Trichloroethane	3125.00	0.00	4155.93	4097.95	133	131	2	52-162	YES
on Tetrachloride	3125.00	0.00	3119.43	3076.65	100	98	2	70-140	YES
ene	3125.00	0.00	4093.61	3987.09	131	128	2	37-151	YES
richloroethene	3125.00	0.00	4256.29	4287.67	136	137	-1	71-157	YES
1,2-Dichloropropane	3125.00	0.00	2955.61	3008.88	94	96	-2	1-210	YES
Bromodichloromethane	3125.00	0.00	2985.25	3034.13	96	97	-1	35-155	YES
2-Chloroethyl Vinyl Ether	3125.00	0.00	3005.40	2598.98	96	83	14	1-305	YES
cis-1,3-Dichloropropene	3125.00	0.00	3474.81	3527.29	111	113	-2	1-227	YES
trans-1,3-Dichloropropene	1187.50	0.00	1243.64	1262.86	105	106	-1	17-183	YES
1,1,2-Trichloroethane	3125.00	0.00	2946.21	3001.60	94	96	-2	52-150	YES
Dibromochloromethane	3125.00	0.00	2924.95	2959.74	94	95	-1	53-149	YES
Bromoform	3125.00	0.00	2825.20	2852.64	90	91	-1	45-169	YES
4-Methyl-2-Pentanone	15625.00	0.00	12942.57	12727.97	83	81	2	50-124	YES
Toluene	3125.00	0.00	3948.40	4018.09	126	128	-2	47-150	YES
Tetrachloroethene	3125.00	0.00	4119.84	4290.86	132	137	-4	64-148	YES
2-Hexanone	15625.00	0.00	14517.80	14288.83	93	91	2	52-140	YES
Chlorobenzene	3125.00	0.00	2994.29	3038.23	96	97	-1	37-160	YES
Ethylbenzene	3125.00	2206.49	24945.39	8406.36	728	198	114	37-162	NO

N/C = Could not calculate

Lab Chronicle: _____ Ent. by _____

_____ Ver. by _____

* %RPD for this compound exceeds method specified limit.

Lancaster Laboratories, Inc.
GC/MS Volatiles Matrix Spike/Spike Duplicate Recoveries

Unspiked: ^HCR16	Matrix spike: ^HN306	Spike Duplicate: ^HN307
53A46DL 2206904	53A46DLMS 2206904	53A46DLMSD2206904
Method: 1177 +SPECIALS	Matrix/Level: SM	Batch: H942992AB
Instrument: HP03974	Dilution Factor: 1.0	% Moisture: 20

COMPOUND NAME	SPIKE LEVEL	US CONC UG/KG	MS CONC UG/KG	MSD CONC UG/KG	MS REC %	MSD REC %	RPD %	RANGE LOWER-UPPER	IN SPEC
Xylene (total)	9375.00	0.00	8221.29	11302.78	88	120	-31	61-165	YES
Styrene	3125.00	3341.45	23914.41	9450.58	658	195	108	74-136	NO
1,1,2,2-Tetrachloroethane	3125.00	0.00	3009.88	3441.01	96	110	-14	46-157	YES

N/C = Could not calculate

Lab Chronicle: _____ Ent. by _____.

_____ Ver. by _____.

_____.

* %RPD for this compound exceeds method specified limit.

GTA
11/

DOW ENVIRONMENTAL, INC.

DOW-HANGING ROCK

IRONTON - GRAB SOIL SAMPLES

FIELD DUPLICATES

COMPOUND	DHR-53C-13-102194	DHR-53C-13DUP-102194	CONTROL LIMIT
Acrylonitrile (ug/kg)	< 120	< 120	+/- 4 X CRQL
Methylene Chloride (ug/kg)	< 6	< 6	+/- 4 X CRQL
Ethylbenzene (ug/kg)	44	16	+/- 4 X CRQL
Styrene (ug/kg)	110	38	+/- 50%
Barium (mg/kg)	89	74	+/- 50%
Moisture (% by wt.)	16	16.5	+/- 50%

AWD TECHNOLOGIES

A Subsidiary of
The Dow Chemical Company

PGH-95-CDY-0028

DATE January 10, 1995

TO Mr. Kristian Macoskey
Dow Environmental, Inc.
Pittsburgh, Pennsylvania

FROM Cheryl Young
Dow Environmental, Inc.

SUBJECT Data Validation of:
Volatile Organic Chemicals and Barium

Re: The Dow Chemical Company
Dow Hanging Rock - Ironton, Ohio

Lancaster Laboratories Sample Numbers: 2206930-2206931
2207694-2207714

SDG#: IRN02

Samples:

DHR-11A-46-102094	DHR-54A-24-102194
DHR-11A-24-102094	DHR-54B-13-102194
DHR-46A-46-102094	DHR-54B-35-102194
DHR-17C-13-102194	DHR-54C-13-102194
DHR-17B-13-102194	DHR-54C-13-102194DUP
DHR-52A-24-102194	DHR-54C-35-102194
DHR-54B-57-102194	DHR-20C-46-102294
DHR-48A-24-102194	DHR-20B-02-102294
DHR-54C-57-102194	DHR-20B-46-102294
DHR-55A-24-102194	DHR-20C-24-102294
DHR-54A-46-102194	

Field Duplicates: Sample DHR-54C-13-102194DUP is a field duplicate of sample DHR-54C-13-102194.

Overview

This set of samples collected on October 20, 21, and 22, 1994, containing twenty-one (21) soil samples, including one field duplicate pair, were analyzed for volatile organic chemicals by EPA SW-846 Method 8240 and Barium using Method 6010A. The percent moisture was determined by using modified Method 160.3 for each environmental sample.

Summary

All compounds were successfully analyzed in all samples The organic analytical data were evaluated by the following quality assurance/quality control (QA/QC) parameters where applicable: holding times, initial and continuing calibrations, system monitoring compound/surrogate spike recoveries, method blanks, field duplicates, matrix spike/matrix spike duplicates (MS/MSDs), laboratory control samples, analytical sequence, compound identification and quantitation, and transcription.

The inorganic analytical data were evaluated by the following quality assurance/quality control (QA/QC) parameters where applicable: technical holding times, initial and continuing calibrations, laboratory blanks, ICP interference check samples, matrix spike/matrix spike duplicate (MS/MSD) recoveries, laboratory duplicates, laboratory control samples, ICP serial dilutions, and transcription.

Validated sample analysis results are listed on the attached data summary form. Areas of concern with respect to data quality and usability are discussed below.

Minor Issues

Blank contamination of barium was identified in laboratory blanks. All barium results were greater than five times the greatest amount of contamination (5.6 ug/l), therefore, no qualification of data was indicated.

The surrogate recovery of 4-Bromofluorobenzene was greater than quality control limits in the dilution of sample DHR-11A-46-102094. All associated volatile results greater than the CRQL, were qualified "J", estimated.

The percent recoveries (%Rs) and the relative percent differences (RPDs) of ethylbenzene and styrene were outside of quality control limits in matrix spike/matrix spike duplicate samples. Associated data were not qualified because qualification of data is not based on MS/MSD criteria alone.

Notes

Please note that results for sample dilutions have been reported on the analysis reports produced by the laboratory.

Sample DHR-46A-46-102094 was diluted for the volatile analysis.

Comparisons of the field duplicate samples DHR-54C-13-102194 and DHR-54C-13-102194Dup were within the quality control limits of +/- fifty percent (50%). These comparisons are included in the support documentation section of this report.

The laboratory reported that the medium level soil method was used for sample DHR-11A-46-102094 due to the high level of target compounds. The quantitation limits for this sample were raised accordingly.

The laboratory reported that a secondary ion quantitation was performed on 4-bromofluorobenzene in 11A46 by using m/z 174 instead of m/z 95 due to interference with the primary ion.

Information Regarding Report Content

Attachments:

1. Glossary of data qualifier codes.
2. Data Summary. This may include:
   a) All positive results with qualifier codes, if applicable.
   b) All estimated detection limits qualified with UJ.
3. Appendix A - Results as Reported by the Laboratory.
4. Appendix B - Support Documentation includes details to support the statements made in this report.

GLOSSARY OF DATA QUALIFIER CODES

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds)

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. The result is unusable.

CODES RELATED TO QUANTITATION

(can be used for positive results and sample quantitation limits)

J = Analyte present. Reported value may not be accurate or precise.

UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

DATA SUMMARY

DOW ENVI ENTAL, INC.
DDW - HANGING ROCK
IRONTON - GRAB SOIL SAMPLES / SDG # IRN02-01
DATA SUMMARY

Compound	DHR-11A-46-102094	DHR-11A-24-102094	DHR-46A-46-102094	DHR-17C-13-102194	DHR-17B-13-102194	DHR-52A-24-102194	DHR-54B-57-102194
Acrylonitrile (ug/kg)	< 540,000	< 120	< 120	< 120	< 120	< 120	< 120
Methylene Chloride (ug/kg)	< 27,000	< 6	< 6	< 6	< 6	< 6	9
Ethylbenzene (ug/kg)	570,000 J	8	1,200	< 6	< 6	< 6	< 6
Styrene (ug/kg)	530,000 J	17	320	< 6	< 6	< 6	< 6
Barium (mg/kg)	73	67	103	61	58	71	118
Moisture (% by wt.)	6.8	17.6	17.8	15.9	15.7	17.0	18.0

Compound	DHR-48A-24-102194	DHR-54C-57-102194	DHR-55A-24-102194	DHR-54A-46-102194	DHR-54A-24-102194	DHR-54B-13-102194	DHR-54B-35-102194
Acrylonitrile (ug/kg)	< 120	< 120	< 120	< 120	< 120	< 120	< 120
Methylene Chloride (ug/kg)	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Ethylbenzene (ug/kg)	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Styrene (ug/kg)	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Barium (mg/kg)	61	132	72	98	63	63	83
Moisture (% by wt.)	17.6	17.8	16.9	18.1	17.6	15.6	17.4

Compound	DHR-54C-13-102194	DHR-54C-13-102194DUP	DHR-54C-35-102194	DHR-20C-46-102294	DHR-20B-02-102294	DHR-20B-46-102294	DHR-20C-24-102294
Acrylonitrile (ug/kg)	< 120		< 120	< 120	< 120	< 120	< 120
Methylene Chloride (ug/kg)	< 6		< 6	< 6	< 6	< 6	< 6
Ethylbenzene (ug/kg)	< 6		< 6	< 6	7	28	< 6
Styrene (ug/kg)	< 6		< 6	< 6	< 6	47	< 6
Barium (mg/kg)	58	93	79	113	69	106	83
Moisture (% by wt.)	15.5	15.2	17.1	17.3	16.2	18.5	15.1

APPENDIX A

RESULTS AS REPORTED BY THE LABORATORY

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206930
Collected: 10/20/94 at 14:10 by DM

Submitted: 10/24/94 Reported: 11/11/94
Discard: 1/11/95

DHR-11A-46-102094 Grab Soil Sample
Ironton

11A46 SDG#: IRN02-01

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	68.	10.	mg/kg	73.	11.
9001	Styrene	490,000.	25,000.	ug/kg	530,000.	27,000.
0111	Moisture	6.8	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
03:26:52 D 0002 2 0 118283 440219
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206930
Collected: 10/20/94 at 14:10 by DM

Submitted: 10/24/94 Reported: 11/11/94
Discard: 1/11/95

DHR-11A-46-102094 Grab Soil Sample
Ironton

11A46 SDG#: IRN02-01

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 500,000.	500,000.	ug/kg	< 540,000.	540,000.
3440	Methylene Chloride	< 25,000.	25,000.	ug/kg	< 27,000.	27,000.
3458	Ethylbenzene	530,000.	25,000.	ug/kg	570,000.	27,000.

Poor surrogate recoveries were observed for the GC/MS volatile fraction due to the dilution needed to perform the analysis.

The GC/MS volatile analysis was performed according to the medium level soil method due to the level of target compounds. The quantitation limits were therefore raised.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206931
Collected: 10/20/94 at 13:55 by DM

Submitted: 10/24/94 Reported: 11/11/94
Discard: 1/11/95

DHR-11A-24-102094 Grab Soil Sample
Ironton

11A24 SOG#: IRN02-02

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	55.2	9.6	mg/kg	67.	12.
9001	Styrene	14.	5.	ug/kg	17.	6.
0111	Moisture	17.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
03:27:18 D 0002 2 0 118283 440219
603 25.00 00033600 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2206931
Collected: 10/20/94 at 13:55 by DM

Submitted: 10/24/94 Reported: 11/11/94
Discard: 1/11/95

DHR-11A-24-102094 Grab Soil Sample
Ironton

11A24 SDG#: IRN02-02

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	7.	5.	ug/kg	8.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994

Analysis Repo

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207694
Collected: 10/20/94 at 14:45 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-46A-46-102094 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7D15.600
46A46 SDG#: IRN02-03

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	84.4	9.5	mg/kg	103.	12.
9001	Styrene	260.	5.	ug/kg	320.	6.
0111	Moisture	17.8	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:44:08 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207694
Collected: 10/20/94 at 14:45 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-46A-46-102094 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
46A46 SDG#: IRN02-03

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	960.	5.	ug/kg	1,200.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207695
Collected: 10/21/94 at 17:30 by DWM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

OHR-17C-13-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
17C13 SDG#: IRH02-04

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	51.7	9.5	mg/kg	61.	11.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	15.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:44:20 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207695
Collected: 10/21/94 at 17:30 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-17C-13-102194 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
17C13 SDG#: IRN02-04

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207696
Collected: 10/21/94 at 17:15 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-17B-13-102194 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
17B13 SDG#: IRN02-05

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	48.8	9.9	mg/kg	58.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
D111	Moisture	15.7	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:44:30 D 0002 21 0 118283 440395
603 25.00 00D33600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207696
Collected: 10/21/94 at 17:15 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-17B-13-102194 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
17B13 SDG#: IRN02-05

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207697
Collected: 10/21/94 at 16:50 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-52A-24-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
52A24 SDG#: IRN02-06

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	59.3	9.9	mg/kg	71.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	17.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:44:42 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207697
Collected: 10/21/94 at 16:50 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-52A-24-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
52A24 SDG#: IRN02-06

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

"22"
9 15

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207698
Collected: 10/21/94 at 15:45 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54B-57-102194 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54B57 SDG#: IRN02-07

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	96.8	9.8	mg/kg	118.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	18.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:44:51 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2207698
Collected: 10/21/94 at 15:45 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-548-57-102194 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.D. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54857 SOG#: IRN02-07

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	7.	5.	ug/kg	9.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
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LLI Sample No. SW 2207699
Collected: 10/21/94 at 17:05 by ONM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

OHR-48A-24-102194 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
48A24 SDG#: IRN02-08

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	50.1	9.5	mg/kg	61.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	17.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:45:02 0 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2207699
Collected: 10/21/94 at 17:05 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-48A-24-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
48A24 SDG#: IRN02-08

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2207700
Collected: 10/21/94 at 15:10 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

OHR-54C-57-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54C57 SDG#: IRN02-09

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	108.	9.7	mg/kg	132.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	17.8	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:45:12 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2207700
Collected: 10/21/94 at 15:10 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54C-57-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54C57 SDG#: IRN02-09

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2207701
Collected: 10/21/94 at 16:35 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-55A-24-102194 Grab Soil Sample

Account No: D6948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 30D
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
55A24 SDG#: IRN02-10

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	59.7	9.7	mg/kg	72.	12.
90D1	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	16.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:45:23 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2207701
Collected: 10/21/94 at 16:35 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-55A-24-102194 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
55A24 SDG#: IRN02-10

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2207702
Collected: 10/21/94 at 16:15 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54A-46-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54A46 SDG#: IRN02-11

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	80.6	9.8	mg/kg	98.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	18.1	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:45:33 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

*3216
9139

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LLI Sample No. SW 2207702
Collected: 10/21/94 at 16:15 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54A-46-102194 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54A46 SDG#: IRN02-11

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

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LLI Sample No. SW 2207703
Collected: 10/21/94 at 16:10 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54A-24-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54A24 SDG#: IRN02-12

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	52.1	9.7	mg/kg	63.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	17.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:45:44 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2207703
Collected: 10/21/94 at 16:10 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54A-24-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, DH Proj. No. 7015.600
54A24 SOG#: IRN02-12

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2207704
Collected: 10/21/94 at 15:30 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54B-13-102194 Grab Soil Sample

Account No: D6948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7D15.600
54B13 SDG#: IRN02-13

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	53.3	9.7	mg/kg	63.	11.
9D01	Styrene	< 5.	5.	ug/kg	< 6.	6.
D111	Moisture	15.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:45:55 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2207704
Collected: 10/21/94 at 15:30 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54B-13-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54B13 SDG#: IRH02-13

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

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Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2207705
Collected: 10/21/94 at 15:40 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54B-35-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54B35 SDG#: IRN02-14

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	68.8	9.8	mg/kg	83.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	17.4	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:46:06 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2207705
Collected: 10/21/94 at 15:40 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54B-35-102194 Grab Soil Sample

Account No: D6948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54B35 SDG#: IRN02-14

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2207706
Collected: 10/21/94 at 14:55 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54C-13-102194 Unspiked Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54C13 SDG#: IRN02-15BK

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/824DA)			See Page 2		
1646	Barium	49.0	9.5	mg/kg	58.	11.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	15.5	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:46:17 D 0002 21 0 118283 440395
603 25.00 00033600 ASR00D

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207706
Collected: 10/21/94 at 14:55 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54C-13-102194 Unspiked Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54C13 SDG#: IRN02-15BK

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3435	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3446	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207707
Collected: 10/21/94 at 14:55 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54C-13-102194 Matrix Spike Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54C13 SDG#: IRN02-15MS

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	244.	9.6	mg/kg	289.	11.
9001	Styrene	22.	5.	ug/kg	26.	6.
0118	Moisture	15.5	0.5	% by wt.		

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:46:28 D 0002 21 0 118283 440395
603 25.00 00032400 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2207707
Collected: 10/21/94 at 14:55 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54C-13-102194 Matrix Spike Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54C13 SDG#: IRN02-15MS

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	180.	100.	ug/kg	210.	120.
3440	Methylene Chloride	23.	5.	ug/kg	27.	6.
3458	Ethylbenzene	23.	5.	ug/kg	27.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2207708
Collected: 10/21/94 at 14:55 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54C-13-102194 Matrix Spike Duplicate Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54C13 SDG#: IRN02-15MSD

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	252.	9.9	mg/kg	298.	12.
9001	Styrene	22.	5.	ug/kg	26.	6.
0118	Moisture	15.5	0.5	% by wt.		

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:46:39 D 0002 21 0 118283 440395
603 25.00 00032400 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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Where quality is a science.

LLI Sample No. SW 2207708
Collected: 10/21/94 at 14:55 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

OHR-54C-13-102194 Matrix Spike Duplicate Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54C13 SDG#: IRN02-15MSD

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	190.	100.	ug/kg	220.	120.
3440	Methylene Chloride	25.	5.	ug/kg	30.	6.
3458	Ethylbenzene	24.	5.	ug/kg	28.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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Where quality is a science.

LLI Sample No. SW 2207709
Collected: 10/21/94 at 14:55 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54C-13-102194 Duplicate Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54C13 SOG#: IRN02-15DUP

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	78.8	9.8	mg/kg	93.	12.
0118	Moisture	15.5	0.5	% by wt.		
0121	Moisture Duplicate	15.2	0.5	% by wt.		

The duplicate moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:46:50 D 0002 21 0 118283 440395
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207710
Collected: 10/21/94 at 15:05 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54C-35-102194 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54C35 SDG#: IRN02-16

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	65.8	9.8	mg/kg	79.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	17.1	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:46:57 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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Where quality is a science.

LLI Sample No. SW 2207710
Collected: 10/21/94 at 15:05 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-54C-35-102194 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
54C35 SDG#: IRN02-16

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207711
Collected: 10/22/94 at 10:15 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-46-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20C46 SDG#: IRN02-17

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	93.3	9.8	mg/kg	113.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	17.3	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:47:08 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2207711
Collected: 10/22/94 at 10:15 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-46-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20C46 SDG#: IRN02-17

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207712
Collected: 10/22/94 at 09:30 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-208-02-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20802 SDG#: IRN02-18

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	58.	10.	mg/kg	69.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	16.2	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:47:18 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207712
Collected: 10/22/94 at 09:30 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20B-02-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20B02 SDG#: IRN02-18

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	6.	5.	ug/kg	7.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2207713
Collected: 10/22/94 at 09:40 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-208-46-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20B46 SDG#: IRN02-19

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	86.1	9.8	mg/kg	106.	12.
9001	Styrene	38.	5.	ug/kg	47.	6.
0111	Moisture	18.5	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:47:31 D 0002 21 0 118283 440395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2207713
Collected: 10/22/94 at 09:40 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-208-46-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20646 SDG#: IRN02-19

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	23.	5.	ug/kg	28.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2207714
Collected: 10/22/94 at 10:10 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-24-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20C24 SDG#: IRN02-20*

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	70.8	9.5	mg/kg	83.	11.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	15.1	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris Macoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:47:42 0 0002 21 0 118283 44D395
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

*22
9.13

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LLI Sample No. SW 2207714
Collected: 10/22/94 at 10:10 by DNM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-24-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20C24 SDG#: IRN02-20*

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

APPENDIX B

SUPPORT DOCUMENTATION

QUALITY ASSURANCE SUMMARY

BLANKS

Name: LANCASTER_LABORATORIES___

SDG No.: IRN02

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Barium			2.0	B							P

QUALITY ASSURANCE SUMMARY

BLANKS

Lab Name: LANCASTER_LABORATORIES___

SDG No.: IRN02

Preparation Blank Matrix (soil/water): _SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Barium	3.3	B	2.0	B	5.6	B	3.3	B	0.332	B	P

SOIL VOLATILE SURROGATE RECOVERY

2B

LAB NAME: LANCASTER LABS SDG No: IRN02

LEVEL:MED

	EPA SAMPLE NO.	S1 (DCE) #	S2 (TOL) #	S3 (BFB) #	OTHER	TOT OUT
01	11A46	117	112	136 D		
02						
03	LAB QC					
04	VBLKH10	101	97	101		
05	VBLKH14	107	101	99		
06	VBLKH15	90	94	93		
07	53A46DL	84	83	91		
08	53A46DLMS	90	92	90		
09	53A46DLMSD	99	104	100		
10	LCSMH04	99	103	105		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

				QC LIMITS
S1	(DCE)	=	1,2-Dichloroethane-d4	70 - 121
S2	(TOL)	=	Toluene-d8	81 - 117
S3	(BFB)	=	4-Bromofluorobenzene	74 - 121

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

Lancaster Laboratories, Inc. • 2425 New Holland Pike, Lancaster, PA 17601-5994 • 717-656-2301 • Fax: 717-656-2681

Lancaster Laboratories, Inc.
GC/MS Volatiles Matrix Spike/Spike Duplicate Recoveries

Unspiked: ^HCR16
53A460L 2206904
Method: 1177 +SPECIALS
Instrument: HP03974

Matrix spike: ^HN306
53A460LMS 2206904
Matrix/Level: SM
Dilution Factor: 1.0

Spike Duplicate: ^HN307
53A460LMSD2206904
Batch: H942992AB
% Moisture: 20

COMPOUND NAME	SPIKE LEVEL	US CONC UG/KG	MS CONC UG/KG	MSD CONC UG/KG	MS REC %	MSD REC %	RPD %	RANGE LOWER-UPPER	IN SPEC
Chloromethane	3125.00	0.00	5240.76	1684.53	168	54	103	1-273	YES
Vinyl Chloride	3125.00	0.00	5982.91	2132.35	191	68	95	1-251	YES
Bromomethane	3125.00	0.00	6029.40	2569.64	193	82	81	1-242	YES
Chloroethane	3125.00	0.00	5869.83	2194.70	188	70	91	14-230	YES
Trichlorofluoromethane	3125.00	0.00	4695.47	3519.79	150	113	28	17-181	YES
Acrolein	23437.50	0.00	10982.64	6144.31	47	26	58	22-169	YES
1,1-Dichloroethene	3125.00	0.00	2840.00	2627.12	91	84	8	1-234	YES
Acetone	23437.50	0.00	22143.39	21323.87	94	91	3	19-150	YES
Carbon Disulfide	23437.50	0.00	33067.30	28791.73	141	123	14	29-183	YES
Methylene Chloride	3125.00	0.00	4117.27	3986.74	132	128	3	1-221	YES
Acrylonitrile	23437.50	0.00	22158.54	21771.01	94	93	1	51-138	YES
1,1-Dichloroethane	3125.00	0.00	3075.61	2967.60	98	95	3	59-155	YES
1,2-Dichloroethene (total)	6250.00	0.00	6755.89	6702.04	108	107	1	54-156	YES
2-Butanone	23437.50	0.00	25688.13	25875.87	110	110	0	22-167	YES
Chloroform	3125.00	0.00	3019.45	3122.58	97	100	-3	51-138	YES
1,2-Dichloroethane	3125.00	0.00	2942.18	2967.35	94	95	-1	49-155	YES
Vinyl Acetate	15625.00	0.00	15306.76	17353.33	98	111	-12	19-190	YES
1,1,1-Trichloroethane	3125.00	0.00	4155.93	4097.95	133	131	2	52-162	YES
Carbon Tetrachloride	3125.00	0.00	3119.43	3076.65	100	98	2	70-140	YES
Benzene	3125.00	0.00	4093.61	3987.09	131	128	2	37-151	YES
Trichloroethene	3125.00	0.00	4256.29	4287.67	136	137	-1	71-157	YES
1,2-Dichloropropane	3125.00	0.00	2955.61	3008.88	94	96	-2	1-210	YES
Bromodichloromethane	3125.00	0.00	2985.25	3034.13	96	97	-1	35-155	YES
2-Chloroethyl Vinyl Ether	3125.00	0.00	3005.40	2598.98	96	83	14	1-305	YES
cis-1,3-Dichloropropene	3125.00	0.00	3474.81	3527.29	111	113	-2	1-227	YES
trans-1,3-Dichloropropene	1187.50	0.00	1243.64	1262.86	105	106	-1	17-183	YES
1,1,2-Trichloroethane	3125.00	0.00	2946.21	3001.60	94	96	-2	52-150	YES
Dibromochloromethane	3125.00	0.00	2924.95	2959.74	94	95	-1	53-149	YES
Bromoform	3125.00	0.00	2825.20	2852.64	90	91	-1	45-169	YES
4-Methyl-2-Pentanone	15625.00	0.00	12942.57	12727.97	83	81	2	50-124	YES
Toluene	3125.00	0.00	3948.40	4018.09	126	128	-2	47-150	YES
Tetrachloroethene	3125.00	0.00	4119.84	4290.86	132	137	-4	64-148	YES
2-Hexanone	15625.00	0.00	14517.80	14288.83	93	91	2	52-140	YES
Chlorobenzene	3125.00	0.00	2994.29	3038.23	96	97	-1	37-160	YES
Ethylbenzene	3125.00	2206.49	24945.39	8406.36	728	198	114	37-162	NO

N/C = Could not calculate

Lab Chronicle: _____ Ent. by _____.

_____ Ver. by _____.

_____.

* %RPD for this compound exceeds method specified limit.

Lancaster Laboratories, Inc.
GC/MS Volatiles Matrix Spike/Spike Duplicate Recoveries

Unspiked: ^HCR16	Matrix spike: ^HN306	Spike Duplicate: ^HN307
53A460L 2206904	53A460LMS 2206904	53A460LMSD2206904
Method: 1177 +SPECIALS	Matrix/Level: SM	Batch: H942992AB
Instrument: HPD3974	Dilution Factor: 1.0	% Moisture: 20

COMPOUND NAME	SPIKE LEVEL	US CONC UG/KG	MS CONC UG/KG	MSD CONC UG/KG	MS REC %	MSD REC %	RPD %	RANGE LOWER-UPPER	IN SPEC
Xylene (total)	9375.00	0.00	8221.29	11302.78	88	120	-31	61-165	YES
Styrene	3125.00	3341.45	23914.41	9450.58	658	195	108	74-136	NO
1,1,2,2-Tetrachloroethane	3125.00	0.00	3009.88	3441.01	96	110	-14	46-157	YES

N/C = Could not calculate

Lab Chronicle: _____ Ent. by _____.

_____ Ver. by _____.

_____.

* %RPD for this compound exceeds method specified limit.

DOW ENVIRONMENTAL, INC.

DOW-HANGING ROCK

SDG# IRN02-01

FIELD DUPLICATE RESULTS

Compound	DHR-54C-13-102194	DHR-54C-13-102194DUP	Control Limit
Acrylonitrile (ug/kg)	< 120		
Methylene Chloride (ug/kg)	< 6		
Ethylbenzene (ug/kg)	< 6		
Styrene (ug/kg)	< 6		
Barium (mg/kg)	58	93	+/- 50%
Moisture (% by wt.)	15.5	15.2	+/- 50%

AWD TECHNOLOGIES

A Subsidiary of
The Dow Chemical Company

PGH-95-CDY-0030

DATE January 10, 1995

TO Mr. Kristian Macoskey
Dow Environmental, Inc.
Pittsburgh, Pennsylvania

FROM Cheryl Young
Dow Environmental, Inc.

SUBJECT Data Validation of:
Volatile Organic Chemicals and Barium

Re: The Dow Chemical Company
Dow Hanging Rock - Ironton, Ohio

Lancaster Laboratories Sample Numbers: 2207738-2207760

SDG#: IRN03

Soil Samples:

DHR-20C-02-102294	DHR-BG3-24-102294
DHR-20C-02-102294DUP	DHR-BG3-46-102294
DHR-BG1-02-102294	DHR-BG3-68-102294
DHR-BG1-24-102294	DHR-20C-24MS-102294
DHR-BG1-46-102294	DHR-16MSD-24-102294
DHR-BG1-68-102294	DHR-23B-13-102294
DHR-BG2-02-102294	DHR-8A-46-102294
DHR-BG2-24-102294	DHR-16A-24-102294
DHR-BG2-46-102294	DHR-21B-13DUP-102294
DHR-BG2-68-102294	
DHR-BG3-02-102294	

Water Sample: DHR-FBLANK1-102294

Field Duplicates: Sample DHR-20C-02-102294DUP is a field duplicate of sample DHR-20C-02-102294.

AWD Technologies, Inc.
Penn Center West Building III Suite 300 Pittsburgh Pennsylvania 15276 Telephone 412 788 2717 Fax 412 788 1316

Overview

This set of samples collected on October 22, 1994, containing twenty (20) soil samples, including one field duplicate pair, and one (1) water sample included as a field blank, were analyzed for volatile organic chemicals by EPA SW-846 Method 8240 and Barium using Method 6010A. The percent moisture was determined by using modified Method 160.3 for each environmental sample.

Summary

All compounds were successfully analyzed in all samples The organic analytical data were evaluated by the following quality assurance/quality control (QA/QC) parameters where applicable: holding times, initial and continuing calibrations, system monitoring compound/surrogate spike recoveries, method blanks, field duplicates, matrix spike/matrix spike duplicates (MS/MSDs), laboratory control samples, analytical sequence, compound identification and quantitation, and transcription.

The inorganic analytical data were evaluated by the following quality assurance/quality control (QA/QC) parameters where applicable: technical holding times, initial and continuing calibrations, laboratory blanks, ICP interference check samples, matrix and analytical spike recoveries, laboratory duplicates, laboratory control samples, ICP serial dilutions, and transcription.

Validated sample analysis results are listed on the attached data summary form. Areas of concern with respect to data quality and usability are discussed below.

Minor Issues

Barium was reported in the laboratory blanks. All sample results were positive and greater than five times (>5X) the greatest amount of contamination. No qualification was indicated.

Notes

Comparisons of the field duplicate pair DHR-20C-02-102294 and DHR-20C-02-102294DUP were within quality control limits. These comparisons are included in the support documentation section of this report.

Please note that several samples were not included on the chain of custody. The assumption was made that these samples were submitted with those listed on the chain of custody.

The laboratory reported that at the time of entry, samples 2207738 and 2207741 were unadvertently assigned the same sample code, 20C02. Sample 2207741 is the duplicate for 2207738.

Information Regarding Report Content

Attachments:

1. Glossary of data qualifier codes.
2. Data Summary. This may include:
   a) All positive results with qualifier codes, if applicable.
   b) All estimated detection limits qualified with UJ.
3. Appendix A - Results as Reported by the Laboratory.
4. Appendix B - Support Documentation includes details to support the statements made in this report.

GLOSSARY OF DATA QUALIFIER CODES

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds)

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. The result is unusable.

CODES RELATED TO QUANTITATION

(can be used for positive results and sample quantitation limits)

J = Analyte present. Reported value may not be accurate or precise.

UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

DATA SUMMARY

DDW ENVIRONMENTAL, INC.
DOW - HANGING ROCK
IRONTON - GRAB SOIL SAMPLES / SDG # IRN03-01BK
DATA SUMMARY

Compound	DHR-20C-02-102294	DHR-20C-02-102294Dup	DHR-BG1-02-102294	DHR-BG1-24-102294	DHR-BG1-46-102294	DHR-BG1-68-102294	DHR-BG2-02-102294
Acrylonitrile (ug/kg)	< 110	< 110					
Methylene Chloride (ug/kg)	7	< 6					
Ethylbenzene (ug/kg)	< 6	< 6					
Styrene (ug/kg)	< 6	< 6					
Barium (mg/kg)	62	66	65	66	116	154	87
Moisture (% by wt.)	12.7	12.6	15.5	16.0	16.4	17.0	16.9

Compound	DHR-BG2-24-102294	DHR-BG2-46-102294	DHR-BG2-68-102294	DHR-BG3-02-102294	DHR-BG3-24-102294	DHR-BG3-46-102294	DHR-BG3-68-102294
Acrylonitrile (ug/kg)							
Methylene Chloride (ug/kg)							
Ethylbenzene (ug/kg)							
Styrene (ug/kg)							
Barium (mg/kg)	87	118	170	100	79	116	151
Moisture (% by wt.)	16.6	16.6	17.1	16.8	16.0	15.8	17.0

Compound	DHR-20C-24MS-102294	DHR-16MSD-24-102294	DHR-23B-13-102294	DHR-8A-46-102294	DHR-16A-24-102294	DHR-21B-13DUP-102294	DHR-FBLANK1-102294
Acrylonitrile (ug/kg)	< 120	< 120	< 120	< 120	< 120		< 100
Methylene Chloride (ug/kg)	< 6	< 6	< 6	< 6	< 6		< 5
Ethylbenzene (ug/kg)	< 6	< 6	< 6	< 6	< 6		< 5
Styrene (ug/kg)	< 6	< 6	< 6	< 6	< 6		< 5
Barium (mg/kg)		110	74	130	101	48	< 0.10
Moisture (% by wt.)	15.0	18.9	16.1	18.2	17.6	15.5	

APPENDIX A

RESULTS AS REPORTED BY THE LABORATORY

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207738
Collected: 10/22/94 at 09:55 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-02-102294 Unspiked Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7D15.600
20C02 SDG#: IRN03-01BK

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1D61-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	55.	10.	mg/kg	62.	11.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
D111	Moisture	12.7	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:48:19 D 0002 24 0 118283 440403
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207738
Collected: 10/22/94 at 09:55 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-02-102294 Unspiked Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20C02 SDG#: IRN03-018K

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 110.	110.
3440	Methylene Chloride	6.	5.	ug/kg	7.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207739
Collected: 10/22/94 at 09:55 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-02-102294 Matrix Spike Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20C02 SDG#: IRN03-01MS

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	235.	10.	mg/kg	269.	11.
9001	Styrene	20.	5.	ug/kg	23.	6.
0118	Moisture	12.7	0.5	% by wt.		

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:48:29 D 0002 24 0 118283 440403
603 25.00 00032400 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

30

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2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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Where quality is a science.

LLI Sample No. SW 2207739
Collected: 10/22/94 at 09:55 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-02-102294 Matrix Spike Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20C02 SDG#: IRN03-01MS

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	160.	100.	ug/kg	180.	110.
3440	Methylene Chloride	24.	5.	ug/kg	27.	6.
3458	Ethylbenzene	23.	5.	ug/kg	26.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

3

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207740
Collected: 10/22/94 at 09:55 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DNR-20C-02-102294 Matrix Spike Duplicate Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20C02 SDG#: IRN03-01MSD

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	249.	10.	mg/kg	285.	11.
9001	Styrene	20.	5.	ug/kg	23.	6.
0118	Moisture	12.7	0.5	% by wt.		

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:48:40 0 0002 24 0 118283 440403
603 25.00 00032400 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207740
Collected: 10/22/94 at 09:55 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-2DC-02-102294 Matrix Spike Duplicate Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
2DCD2 SDG#: IRN03-01MSD

Account No: D6948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	180.	100.	ug/kg	210.	110.
3440	Methylene Chloride	22.	5.	ug/kg	25.	6.
3458	Ethylbenzene	22.	5.	ug/kg	25.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

33

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207741
Collected: 10/22/94 at 09:55 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-02-102294 Duplicate Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20C02 SDG#: IRN03-D1DUP

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	58.	10.	mg/kg	66.	11.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0118	Moisture	12.7	0.5	% by wt.		
D121	Moisture Duplicate	12.6	0.5	% by wt.		

The duplicate moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:48:49 D 0002 24 0 118283 440403
6D3 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207741
Collected: 10/22/94 at 09:55 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-2DC-02-102294 Duplicate Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
2OCD2 SDG#: IRNO3-D1DUP

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 110.	110.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

35

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. WW 2207754
Collected: 10/22/94 at 16:30 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-FBLANK1-102294 Field Blank Grab Water Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
FB1DH SOG#: IRN03-14BL

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
1508	Purgeables (SW846/8240A)			See Page 2
1746	Barium	< 0.10	0.10	mg/l
9001	Styrene	< 5. <5	5.	ug/l

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:50:20 0 0002 24 0 118283 440403
603 15.00 00029900 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. WW 2207754
Collected: 10/22/94 at 16:30 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-FBLANK1-102294 Field Blank Grab Water Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, DH Proj. No. 7D15.60D
FB1DH SDG#: IRN03-14BL

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
Purgeables (SW846/8240A)				
3496	Acrylonitrile	< 100.	100.	ug/l
3497	Methylene Chloride	< 5.	5.	ug/l
3526	Ethylbenzene	< 5.	5.	ug/l

The GC/MS volatile sample was preserved with 1 + 1 HCl to pH < 2.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
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LLI Sample No. SW 2207755
Collected: 10/22/94 at 10:10 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-2DC-24MS-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
MSC24 SDG#: IRN03-15

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
0111	Moisture	15.0	0.5	% by wt.		
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.					
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:50:29 D 0002 24 0 118283 440403
603 0.00 00029700 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2207755
Collected: 10/22/94 at 10:10 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-24MS-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
MSC24 SDG#: IRN03-15

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables ISW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
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LLI Sample No. SW 2207756
Collected: 10/22/94 at 11:10 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-16MSD-24-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
16-24 SOG#: IRN03-16

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/824DA)			See Page 2		
1646	Barium	89.2	9.9	mg/kg	110.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	18.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:50:39 0 0002 24 0 118283 440403
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2207756
Collected: 10/22/94 at 11:10 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-16MSD-24-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.6D0
16-24 SDG#: IRN03-16

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

Lancaster Laboratories
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LLI Sample No. SW 2207757
Collected: 10/22/94 at 11:30 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-23B-13-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
23B13 SDG#: IRN03-17

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/824DA)			See Page 2		
1646	Barium	62.5	9.9	mg/kg	74.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	16.1	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:50:49 D 0002 24 0 118283 4404D3
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2207757
Collected: 10/22/94 at 11:30 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-23B-13-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
23B13 SOG#: IRN03-17

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

50

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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Analysis Report

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LLI Sample No. SW 2207758
Collected: 10/22/94 at 13:40 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8A-46-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
8A-46 SDG#: IRN03-18

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	106.	9.9	mg/kg	130.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	18.2	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:50:59 D 0002 24 0 118283 440403
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

56

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2207758
Collected: 10/22/94 at 13:40 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8A-46-1D2294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
8A-46 SDG#: IRN03-18

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

57

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2207759
Collected: 10/22/94 at 12:50 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-16A-24-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
16A24 SDG#: IRN03-19

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	83.5	9.8	mg/kg	101.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	17.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:51:09 D 0002 24 0 118283 440403
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2207759
Collected: 10/22/94 at 12:50 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-16A-24-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
16A24 SDG#: IRND3-19

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
[illegible]439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
[illegible]440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
[illegible]458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

56

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

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LLI Sample No. SW 2207760
Collected: 10/22/94 at 12:40 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-21B-13DUP-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
13B21 SDG#: IRN03-20

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	41.	10.	mg/kg	48.	12.
0111	Moisture	15.5	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:51:19 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

60

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

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LLI Sample No. SW 2207742
Collected: 10/22/94 at 14:25 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BG1-02-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG102 SOG#: IRN03-02

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
1646	Barium	65.	10.	mg/kg
0111	Moisture	15.5	0.5	% by wt.

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:49:00 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

36

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Repo

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LLI Sample No. SW 2207743
Collected: 10/22/94 at 14:30 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BG1-24-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG124 SDG#: IRN03-03

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	55.3	9.9	mg/kg	66.	12.
0111	Moisture	16.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:49:06 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.

Analysis Report

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LLI Sample No. SW 2207744
Collected: 10/22/94 at 14:35 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BG1-46-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG146 SDG#: IRN03-04

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	97.	10.	mg/kg	116.	12.
0111	Moisture	16.4	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:49:13 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207745
Collected: 10/22/94 at 14:40 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BG1-68-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG168 SDG#: IRN03-05

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	127.	10.	mg/kg	154.	12.
0111	Moisture	17.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:49:20 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster PA 17601-5994

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207746
Collected: 10/22/94 at 14:50 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BG2-02-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG202 SDG#: IRN03-D6

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	72.0	9.8	mg/kg	87.	12.
0111	Moisture	16.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:49:26 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207747
Collected: 10/22/94 at 14:55 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BG2-24-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG224 SDG#: IRN03-07

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	73.	10.	mg/kg	87.	12.
0111	Moisture	16.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Nostetler at (717) 656-2301
04:49:33 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207748
Collected: 10/22/94 at 15:00 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BG2-46-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG246 SDG#: IRN03-08

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	98.5	9.9	mg/kg	118.	12.
0111	Moisture	16.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:49:39 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207749
Collected: 10/22/94 at 15:05 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BG2-68-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG268 SDG#: IRN03-09

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	141.	10.	mg/kg	170.	12.
0111	Moisture	17.1	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:49:46 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207750
Collected: 10/22/94 at 15:10 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BG3-02-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG302 SDG#: IRN03-10

Account No: D6948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	83.	10.	mg/kg	100.	12.
D111	Moisture	16.8	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:49:52 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207751
Collected: 10/22/94 at 15:15 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BG3-24-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG324 SDG#: IRN03-11

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	66.7	9.9	mg/kg	79.	12.
0111	Moisture	16.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:50:01 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207752
Collected: 10/22/94 at 15:20 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BG3-46-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG346 SDG#: IRN03-12

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	97.9	9.9	mg/kg	116.	12.
0111	Moisture	15.8	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:50:07 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207753
Collected: 10/22/94 at 15:25 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

OHR-BG3-68-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
BG368 SDG#: IRN03-13

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	126.	9.8	mg/kg	151.	12.
0111	Moisture	17.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:50:14 D 0002 24 0 118283 440403
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster PA 17601-5994

APPENDIX B

SUPPORT DOCUMENTATION

QUALITY ASSURANCE SUMMARY

BLANKS

Name: LANCASTER_LABORATORIES___

SDG No.: IRN03

Preparation Blank Matrix (soil/water): _SOIL_

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Barium	1.9	U	1.9	U	15.7	B	1.9	U	0.220	U	P

Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2267738-61

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCEK Quote #:
Name of state where samples were collected:

For LLI use only
FSC:
SCR #: 1062250

(2)

Sample Identification	Date Collected	Time Collected	(3) Grab	Composite	(4) Matrix: Soil	Water	Other	Total # of Containers	(5) Analyses Requested: Ba							Remarks	(6) Temperature of samples upon receipt (if requested)
DHR-BG1-02-102294	102294	1425	x		x			1	x							SAMPLE TUBES	
DHR-BG1-24-102294	102294	1430	x		x			1	x							"	
DHR-BG1-46-102294	102294	1435	x		x			1	x							"	
DHR-BG1-68-102294	102294	1440	x		x			1	x							"	
DHR-BG2-02-102294	102294	1450	x		x			1	x							"	
DHR-BG2-24-102294	102294	1455	x		x			1	x							"	
DHR-BG2-46-102294	102294	1500	x		x			1	x							"	
DHR-BG2-68-102294	102294	1505	x		x			1	x							"	
DHR-BG3-02-102294	102294	1510	x		x			1	x							"	
DHR-BG3-24-102294	102294	1515	x		x			1	x							"	

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush PER CONTRACT
(Rush TAT is subject to LLI approval and surchage.)
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412-788-2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/13/94	14:00			
[signature]	102294	1600	FEDEX	10/24/94	1000
			K. Gunto	10-2-94	0934

2425 New H ke, Lancaster, PA 17601-5994 (717) 656-2301 Copies: White and yellow should a any samples to Lancaster Laboratories. The pink copy should be retained by the client 6/6/94 #2102

Analysis Req[illegible] / Environmental Services Chain [illegible] Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2207738-61

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY PO.#
Sampler: D. MARTINCEK Quote #:
Name of state where samples were collected:

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (☐ Potable ☐ NPDES)	Other	Total # of Containers	Analyses Requested: AQ	8.2-10							Remarks	Temperature of Samples upon receipt (if requested)
DHR-B63-46-102294	102294	1520	x		x			1	x								Sample Tube	
DHR-B63-68-102294	102294	1525	x		x			1	x								"	
DHR-FBLANK1-102294	102294	1630	x			x		4	x	x								
~~BH~~																		

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush
(Rush TAT is subject to LLI approval and surchage.) PER CONTRACT
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/13/94	14:00			
[signature]	102294	1640	FEDEX	10/24/94	1000
			K. [signature]	10-25-94	0934

DOW ENVIRONMENTAL , INC.

DOW-HANGING ROCK

SDG# IRN03-01BK

FIELD DUPLICATE RESULTS

Compound	DHR-20C-02-102294	DHR-20C-02-102294Dup	Control Limits
Acrylonitrile (ug/kg)	< 110	< 110	+/- 4X CRDL
Methylene Chloride (ug/kg)	7	< 6	+/- 4X CRDL
Ethylbenzene (ug/kg)	< 6	< 6	+/- 4X CRDL
Styrene (ug/kg)	< 6	< 6	+/- 4X CRDL
Barium (mg/kg)	62	66	+/- 50%
Moisture (% by wt.)	12.7	12.6	+/- 50%

AWD TECHNOLOGIES

A Subsidiary of
The Dow Chemical Company

PGH-95-CDY-0029

DATE January 10, 1995

TO Mr. Kristian Macoskey
Dow Environmental, Inc.
Pittsburgh, Pennsylvania

FROM Cheryl Young
Dow Environmental, Inc.

SUBJECT Data Validation of:
Volatile Organic Chemicals and Barium

Re: The Dow Chemical Company
Dow Hanging Rock - Ironton, Ohio

Lancaster Laboratories Sample Numbers: 2207762-2207773
2208611-2208614

SDG#: IRN04

Samples:

DHR-23C-13DUP-102294	DHR-43B-02DUP-102294
DHR-22B-13-102294	DHR-43B-02-102294
DHR-22B-13-102294DUP	DHR-23C-13-102294
DHR-21B-13-102294	DHR-54C-13DUP-102194
DHR-19A-24-102294	DHR-20C-02DUP-102194
DHR-19A-24DUP-102294	DHR-20A-46DUP-102194
DHR-20B-24DUP-102294	

Field Duplicates: Sample DHR-22B-13-102294DUP is a field duplicate of sample DHR-22B-13-102294.

Overview

This set of samples collected on October 21 and 22, 1994, containing thirteen (13) soil samples, including one field duplicate pair, were analyzed for volatile organic chemicals by EPA SW-846 Method 8240 and Barium using Method 6010A. The percent moisture was determined by using modified Method 160.3 for each environmental sample.

Summary

All compounds were successfully analyzed in all samples The organic analytical data were evaluated by the following quality assurance/quality control (QA/QC) parameters where applicable: holding times, initial and continuing calibrations, system monitoring compound/surrogate spike recoveries, method blanks, field duplicates, matrix spike/matrix spike duplicates (MS/MSDs), laboratory control samples, analytical sequence, compound identification and quantitation, and transcription.

The inorganic analytical data were evaluated by the following quality assurance/quality control (QA/QC) parameters where applicable: technical holding times, initial and continuing calibrations, laboratory blanks, ICP interference check samples, matrix and analytical spike recoveries, laboratory duplicates, laboratory control samples, ICP serial dilutions, and transcription.

Validated sample analysis results are listed on the attached data summary form. Areas of concern with respect to data quality and usability are discussed below.

Notes

All data evaluated for all analytical results were within quality control limits. Therefore, no qualification of data was indicated.

Comparisons of the field duplicate pair DHR-22B-13-102294 and DHR-22B-13-102294DUP were within quality control limits. These comparisons are included in the support documentation section of this report.

Please note that some samples were not listed on the chain-of-custody provided with this data package.

Information Regarding Report Content

Attachments:

1. Glossary of data qualifier codes.
2. Data Summary. This may include:
   a) All positive results with qualifier codes, if applicable.
   b) All estimated detection limits qualified with UJ.
3. Appendix A - Results as Reported by the Laboratory.
4. Appendix B - Support Documentation includes details to support the statements made in this report.

GLOSSARY OF DATA QUALIFIER CODES

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds)

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. The result is unusable.

CODES RELATED TO QUANTITATION

(can be used for positive results and sample quantitation limits)

J = Analyte present. Reported value may not be accurate or precise.

UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

DATA SUMMARY

DOW ENVIRONMENTAL, INC.
DOW - HANGING ROCK
IRONTON - GRAB SOIL SAMPLES / SDG# IRN04-01
DATA SUMMARY

Compound	DHR-23C-13DUP-102294	DHR-22B-13-102294	DHR-22B-13-DUP-102194	DHR-21B-13-102294	DHR-19A-24-102294	DHR-19A-24DUP-102294	DHR-20B-24DUP-102294
Acrylonitrile (ug/kg)	< 120	< 120	< 120	< 120	< 120	< 120	< 120
Methylene Chloride (ug/kg)	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Ethylbenzene (ug/kg)	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Styrene (ug/kg)	< 6	< 6	< 6	< 6	< 6	< 6	< 6
Barium (mg/kg)	68	60	NA	50	92	NA	NA
Moisture (% by wt.)	16.5	16.3	16.3	16.3	16.9	17.4	17.1

Compound	DHR-43B-02DUP-102294	DHR-43B-02-102294	DHR-23C-13-102294	DHR-54C-13-DUP-102194	DHR-20C-02-DUP-102194	DHR-20A-46-DUP-102194
Acrylonitrile (ug/kg)	< 110	< 110	< 120	< 120	< 110	< 120
Methylene Chloride (ug/kg)	< 6	< 6	< 6	< 6	< 6	< 6
Ethylbenzene (ug/kg)	< 6	9	< 6	< 6	< 6	82
Styrene (ug/kg)	< 6	< 6	< 6	< 6	< 6	49
Barium (mg/kg)	54	102	76	NA	NA	NA
Moisture (% by wt.)	12.4	11	16.5	15.5	12.7	18.3

APPENDIX A

RESULTS AS REPORTED BY THE LABORATORY

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207762
Collected: 10/22/94 at 11:45 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-23C-13DUP-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
23C13 SDG#: IRN04-01

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	57.	10.	mg/kg	68.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	16.5	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:51:47 D 0002 12 0 118283 440404
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207762
Collected: 10/22/94 at 11:45 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-23C-13DUP-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
23C13 SDG#: IRN04-01

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207763
Collected: 10/22/94 at 12:15 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-22B-13-102294 Unspiked Grab Soil Sample

Ow Hanging Rock - Ironton, OH Proj. No. 7015.600
22B13 SDG#: IRN04-028K

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/824DA)			See Page 2		
1646	Barium	50.	10.	mg/kg	60.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	16.3	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:51:58 D 0002 12 0 118283 440404
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207763
Collected: 10/22/94 at 12:15 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-228-13-102294 Unspiked Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
22B13 SDG#: IRN04-02BK

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207764
Collected: 10/22/94 at 12:15 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-22B-13-102294 Matrix Spike Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
22B13 SOG#: IRN04-02MS

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	272.	10.	mg/kg	324.	12.
9001	Styrene	22.	5.	ug/kg	26.	6.
0118	Moisture	16.3	0.5	% by wt.		

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:52:08 D 0002 12 0 118283 440404
603 25.00 00032400 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

26

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207764
Collected: 10/22/94 at 12:15 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-22B-13-102294 Matrix Spike Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
22B13 SDG#: IRN04-02MS

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	150.	100.	ug/kg	180.	120.
3440	Methylene Chloride	23.	5.	ug/kg	27.	6.
3458	Ethylbenzene	25.	5.	ug/kg	30.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207765
Collected: 10/22/94 at 12:15 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-22B-13-102294 Matrix Spike Duplicate Grab Soil Sample
Dow Hanging Rock - Ironton, DH Proj. No. 7015.600
22B13 SDG#: IRN04-02MSD

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	250.	10.	mg/kg	299.	12.
9001	Styrene	21.	5.	ug/kg	25.	6.
0118	Moisture	16.3	0.5	% by wt.		

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:52:18 D 0002 12 0 118283 440404
603 25.00 00032400 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

28

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207765
Collected: 10/22/94 at 12:15 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-22B-13-102294 Matrix Spike Duplicate Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7D15.600
22B13 SDG#: IRN04-02MSD

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	170.	100.	ug/kg	200.	120.
3440	Methylene Chloride	23.	5.	ug/kg	27.	6.
3458	Ethylbenzene	24.	5.	ug/kg	29.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207766
Collected: 10/22/94 at 12:15 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DNR-22B-13-102294 Duplicate Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
22B13 SOG#: IRN04-02DUP

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	51.	10.	mg/kg	61.	12.
0118	Moisture	16.3	0.5	% by wt.		
0121	Moisture Duplicate	16.4	0.5	% by wt.		

The duplicate moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:52:30 D 0002 12 0 118283 440404
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

30

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207767
Collected: 10/22/94 at 12:40 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-21B-13-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
21B13 SDG#: IRN04-03

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	42.	10.	mg/kg	50.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	16.3	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:52:38 D 0002 12 0 118283 440404
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

31

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
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LLI Sample No. SW 2207767
Collected: 10/22/94 at 12:40 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-21B-13-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
21B13 SOG#: IRN04-03

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
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LLI Sample No. SW 2207768
Collected: 10/22/94 at 09:10 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-19A-24-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, DH Proj. No. 7015.600
19A24 SDG#: IRN04-04

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	77.	10.	mg/kg	92.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	16.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:52:48 D 0002 12 0 118283 440404
603 25.00 0003360D ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207768
Collected: 10/22/94 at 09:10 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-19A-24-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
19A24 SDG#: IRN04-04

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207769
Collected: 10/22/94 at 09:10 by OM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-19A-24DUP-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7D15.6D0
9A24D SDG#: IRN04-05

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
0111	Moisture	17.4	0.5	% by wt.		
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.					
9001	Styrene	< 5	5.	ug/kg	< 6	6.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:52:59 D 0002 12 0 118283 440404
603 0.00 0002970D ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

35

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2207769
Collected: 10/22/94 at 09:10 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-19A-240UP-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
9A24D SDG#: IRN04-05

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207770
Collected: 10/22/94 at 09:35 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-208-240UP-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
2B24D SDG#: IRN04-06

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
0111	Moisture	17.1	0.5	% by wt.		
	"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.					
9001	Styrene	<5.	5.	ug/kg	<6.	6.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:53:09 D 0002 12 0 118283 44D404
603 0.00 00029700 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2207770
Collected: 10/22/94 at 09:35 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20B-24DUP-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
2B24D SDG#: IRN04-06

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207771
Collected: 10/22/94 at 11:05 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-438-02DUP-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
3B02D SDG#: IRN04-07

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	47.	10.	mg/kg	54.	11.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	12.4	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:53:19 D 0002 12 0 118283 440404
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207771
Collected: 10/22/94 at 11:05 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-43B-02DUP-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
3B02D SDG#: IRN04-07

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 110.	110.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207772
Collected: 10/22/94 at 11:05 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-43B-02-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
43B02 SDG#: IRN04-08

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	90.	10.	mg/kg	102.	11.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	11.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:53:29 D 0002 12 D 118283 440404
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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Where quality is a science.

LLI Sample No. SW 2207772
Collected: 10/22/94 at 11:05 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-438-02-102294 Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
43802 SDG#: 1RND4-08

Account No: D6948
AWD Technologies, Inc.
Building 111
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 110.	110.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	8.	5.	ug/kg	9.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

42

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207773
Collected: 10/22/94 at 11:45 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-23C-13-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
13C23 SDG#: IRN04-09

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	64.	10.	mg/kg	76.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	16.5	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:53:39 D 0002 12 0 118283 440404
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207773
Collected: 10/22/94 at 11:45 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-23C-13-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
13C23 SDG#: IRN04-09

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2208611
Collected: 10/21/94 at 14:55 by DNM

Submitted: 10/27/94 Reported: 11/14/94
Discard: 11/29/94

DHR-54C-13-DUP-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600

D5413 SDG#: IRN04-10

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
0118	Moisture	15.5	0.5	% by wt.		
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:12:24 D 0002 4 0 0 440618
603 0.00 00028500 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2208611
Collected: 10/21/94 at 14:55 by DNM

Submitted: 10/27/94 Reported: 11/14/94
Discard: 11/29/94

DHR-54C-13-DUP-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600

05413 SDG#: IRN04-10

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2208612
Collected: 10/22/94 at 10:55 by DNM

Submitted: 10/27/94 Reported: 11/14/94
Discard: 11/29/94

DHR-20C-02-DUP-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600

D20C2 SDG#: IRN04-11

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
0118	Moisture	12.7	0.5	% by wt.		
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:12:35 D 0002 4 0 0 440618
603 0.00 00028500 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

47

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2208612
Collected: 10/22/94 at 10:55 by DNM

Submitted: 10/27/94 Reported: 11/14/94
Discard: 11/29/94

DHR-20C-02-DUP-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

D20C2 SDG#: IRN04-11

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 110.	110.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2208613
Collected: 10/22/94 at 12:15 by DNM

Submitted: 10/27/94 Reported: 11/14/94
Discard: 11/29/94

DHR-22B-13-DUP-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600

D2213 SDG#: IRN04-12

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
0118	Moisture	16.3	0.5	% by wt.		
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:12:49 D 0002 4 0 0 440618
603 0.00 00028500 ASR000

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

4

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2208613
Collected: 10/22/94 at 12:15 by DNM

Submitted: 10/27/94 Reported: 11/14/94
Discard: 11/29/94

DHR-22B-13-DUP-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600

D2213 SDG#: IRN04-12

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
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LLI Sample No. SW 2208614
Collected: 10/22/94 at 09:20 by DNM

Submitted: 10/27/94 Reported: 11/14/94
Discard: 11/29/94

DHR-20A-46-DUP-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600

D2A46 SDG#: IRN04-13*

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
0118	Moisture	18.3	0.5	% by wt.		
9001	Styrene	40.	5.	ug/kg	49.	6.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
D5:13:02 D 0D02 4 0 0 440618
603 D.00 0002850D ASR00D

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2208614
Collected: 10/22/94 at 09:20 by DNM

Submitted: 10/27/94 Reported: 11/14/94
Discard: 11/29/94

DHR-20A-46-DUP-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600

D2A46 SDG#: IRN04-13*

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	67.	5.	ug/kg	82.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

52

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

APPENDIX B

SUPPORT DOCUMENTATION

DOW ENVIRONMENTAL, INC.
DOW-HANGING ROCK
SDG# IRN04-01
FIELD DUPLICATE RESULTS

Compound	DHR-22B-13-102294	DHR-22B-13-DUP-102194	Control Limit
Acrylonitrile (ug/kg)	< 120	< 120	+/- 4 X CRDL
Methylene Chloride (ug/kg)	< 6	< 6	+/- 4 X CRDL
Ethylbenzene (ug/kg)	< 6	< 6	+/- 4 X CRDL
Styrene (ug/kg)	< 6	< 6	+/- 4 X CRDL
Barium (mg/kg)	60	NA	
Moisture (% by wt.)	16.3	16.3	+/- 50%

Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2207738-61
2207762-73

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCEK Quote #:
K. DODRILL
Name of state where samples were collected:

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (☐ Potable ☐ NPDES)	Other	Total # of Containers	Ba	82-10							Remarks	Temperature of samples upon receipt (if requested)
DHR-23C-13DUP-102294	102294	1145	x		x			2	x	x								
DHR-23D-13-102294	102294	1200	x		x			2	x	x							HOLD	
DHR-22B-13-102294	102294	1215	x		x			2	x	x								
DHR-22B-13DUP-102294	102294	1215	x		x			2	x	x								
DHR-22C-13-102294	102294	1230	x		x			2	x	x							HOLD	
DHR-8A-46-102294	102294	1340	x		x			2	x	x								
DHR-21B-13-102294	102294	1240	x		x			2	x	x								
DHR-16A-24-102294	102294	1250	x		x			2	x	x								
DHR-21B-13DUP-102294	102294	1240	x		x			1	x									
DHR-22C-13DUP-102294	102294	1230	x		x			1	x								HOLD	

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush
(Rush TAT is subject to LLI approval and surchage.) PER CONTRACT
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/19/94	14:00			
[signature]	102294	1600	FEDEX	10/24/94	1000
			K. Guito	10-25-94	0934

Analysis Reque[illegible] Environmental Services Chain o[illegible]ustody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2207738-61
2207762-73

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCEK Quote #:
K. DODRILL
Name of state where samples were collected:

For LLI use only
FSC:
SCR #: 10622250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (☐ Potable ☐ NPDES)	Other	Total # of Containers	Ba	8240							Remarks	Temperature of samples upon receipt (if requested)
DHR-20C-24MS-102294	102294	1010	x		x			1		x								
DHR-19A-24DUP-102294	102294	~~10~~ 0910	x		x			1		x								
DHR-20B-24DUP-102294	102294	0935	x		x			1		x								
DHR-20D-68-102294	102294	1055	x		x			2	x	x							HOLD	
DHR-16MSD-24-102294	102294	1110	x		x			3	x	x								
DHR-43B-02DUP-102294	102294	1105	x		x			2	x	x								
DHR-43B-02-102294	102294	1105	x		x			2	x	x								
DHR-43C-02-102294	102294	1100	x		x			2	x	x							HOLD	
DHR-23B-13-102294	102294	1130	x		x			2	x	x								
DHR-23C-13-102294	1145	1145	x		x			2	x	x								

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush PER CONTRACT
(Rush TAT is subject to LLI approval and surchage.)
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/19/94	14:00			
[signature]	102294	1600	FEDEX	10/24/94	1000
			K. Guito	10-25-94	0934

Analysis Request/ Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For LLI use only
Acct. # 6948 Sample # 2207694-14
2207738-61
2207762-73

Please print. Instructions on reverse side correspond with circled numbers.

(1)
Client: AWD TECHNOLOGIES Acct. #:
Project Name/#: IRONTON PWSID #:
Project Manager: KRIS McCOSKEY P.O.#
Sampler: D. MARTINCEK K. DODRILL Quote #:
Name of state where samples were collected:

For LLI use only
FSC:
SCR #: 1062250

(2) (3) (4) (5) (6)

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water (Potable / NPDES)	Other	Total # of Containers	Ba	8240						Remarks	Temperature of samples upon receipt (if requested)
DHR-19A-24-102294	102294	0910	x		x			2	x	x							
DHR-20B-68-102294	102294	0945	x		x			2	x	x						HOLD	
DHR-20B-46-102294	102294	0940	x		x			2	x	x							
DHR-20C-02-102294	102294	0955	x		x			2	x	x							
DHR-20C-02DUP-102294	102294	0955	x		x			2	x	x							
DHR-20C-24-102294	102294	1010	x		x			2	x	x							
DHR-20D-46-102294	102294	1045	x		x			2	x	x						HOLD	
DHR-20D-24-102294	102294	1040	x		x			2	x	x						HOLD	
DHR-20D-02-102294	102294	1030	x		x			2	x	x						HOLD	

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush
(Rush TAT is subject to LLI approval and surchage.) PER CONTRACT
Date results are needed:
Rush results requested by (please circle): Phone Fax
Phone #: 412 788 2717 Fax #:

(8) **Data Package Options** (please circle if requested)
QC Summary GLP
Type I (Tier I) Other
Type II (Tier II)
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)

Internal Chain of Custody required? Yes No

(9)

Relinquished by:	Date	Time	Received by:	Date	Time
Andrew Miller	10/13/94	1400			
[signature]	102294	1600	FEDEX	10/24/94	1000
			[signature]	10-25-94	0934

2425 New Ho[illegible] Pike, Lancaster, PA 17601-5994 (717) 656-2301 Copies: White and yellow should a[illegible] [illegible]ny samples to Lancaster Laboratories. The pink copy should be retained by the client #2102

AWD TECHNOLOGIES

A Subsidiary of
The Dow Chemical Company

PGH-95-CDY-0031

DATE January 10, 1995

TO Mr. Kristian Macoskey
Dow Environmental, Inc.
Pittsburgh, Pennsylvania

FROM Cheryl Young
Dow Environmental, Inc.

SUBJECT Data Validation of:
Volatile Organic Chemicals and Barium

Re: The Dow Chemical Company
Dow Hanging Rock - Ironton, Ohio

Lancaster Laboratories Sample Numbers: 2207774-2207779
2210718-2210734

SDG#: IRN05

Soil Samples:

DHR-20A-46-102294	DHR-53D-35-102194
DHR-20A-46-102294DUP	DHR-20B-68-102294
DHR-20B-24-102294	DHR-20D-46-102294
DHR-8B-46-102094	DHR-20D-24-102294
DHR-8D-02-102094	DHR-20D-02-102294
DHR-8D-24-102094	DHR-20D-68-102294
DHR-8B-02-102094	DHR-43C-02-102294
DHR-8B-24-102094	DHR-53D-57-102294
DHR-8D-46-102094	DHR-20C-68-102294
DHR-53D-79-102194	
DHR-53D-13-102194	

Water Sample: DHR-TBLK (Trip Blank)

Field Duplicates: Sample DHR-20A-46-102294DUP is a field duplicate of sample DHR-20A-46-102294.

AWD Technologies, Inc.
Penn Center West Building III Suite 300 Pittsburgh Pennsylvania 15276 Telephone 412 788 2717 Fax 412 788 1316

Overview

This set of samples collected on October 20,21, and 22, 1994, containing twenty (20) soil samples, including one field duplicate pair, and one (1) water sample included as a trip blank, were analyzed for volatile organic chemicals by EPA SW-846 Method 8240 and Barium using Method 6010A. The percent moisture was determined by using modified Method 160.3 for each environmental sample.

Summary

All compounds were successfully analyzed in all samples The organic analytical data were evaluated by the following quality assurance/quality control (QA/QC) parameters where applicable: holding times, initial and continuing calibrations, system monitoring compound/surrogate spike recoveries, method blanks, field duplicates, matrix spike/matrix spike duplicates (MS/MSDs), laboratory control samples, analytical sequence, compound identification and quantitation, and transcription.

The inorganic analytical data were evaluated by the following quality assurance/quality control (QA/QC) parameters where applicable: technical holding times, initial and continuing calibrations, laboratory blanks, ICP interference check samples, matrix and analytical spike recoveries, laboratory duplicates, laboratory control samples, ICP serial dilutions, and transcription.

Validated sample analysis results are listed on the attached data summary form. Areas of concern with respect to data quality and usability are discussed below.

Minor Issues

The system monitoring compound (surrogate) 4-Bromofluorobenzene has a recovery greater than quality control limits in the dilution of sample DHR-8B-46-102094. Detected volatile target compounds were qualified "J".

Percent recoveries and Relative Percent Differences (RPDs) were outside of quality control limits for ethylbenzene and styrene in the matrix spike/matrix spike duplicate (MS/MSD) sample. No qualification of data was indicated since qualification is not based on MS/MSD criteria alone.

Notes

Comparisons of the field duplicate pair DHR-20A-46-102294 and DHR-20A-46-102294DUP were within quality control limits. These comparisons are included in the support documentation section of this report.

Please note that samples DHR-8B-46-102094 and DHR-53D-79-102194 were diluted for the volatile analyses. Results from these diluted samples have been reported on the Form Is by the laboratory.

The laboratory reported that a secondary ion quantitation was performed on 4-bromofluorobenzene in sample DHR-8B-46-102094 by using m/z 174 instead of m/z 95 due to interference with the primary ion.

Information Regarding Report Content

Attachments:

1. Glossary of data qualifier codes.
2. Data Summary. This may include:
   a) All positive results with qualifier codes, if applicable.
   b) All estimated detection limits qualified with UJ.
3. Appendix A - Results as Reported by the Laboratory.
4. Appendix B - Support Documentation includes details to support the statements made in this report.

GLOSSARY OF DATA QUALIFIER CODES

CODES RELATING TO IDENTIFICATION

(confidence concerning presence or absence of compounds)

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result. The result is unusable.

CODES RELATED TO QUANTITATION

(can be used for positive results and sample quantitation limits)

J = Analyte present. Reported value may not be accurate or precise.

UJ = Not detected. Quantitation limit may be inaccurate or imprecise.

DATA SUMMARY

DOW ENVIRONMENTAL, INC.
DOW - HANGING ROCK
IRDNTON - GRAB SOIL SAMPLES / SDG # IRN05-01BK
DATA SUMMARY

Compound	DHR-20A-46-102294	DHR-20A-46-102294Dup	DHR-20B-24-102294	DHR-8B-46-102094	DHR-8D-02-102094	DHR-8D-24-102094	DHR-8B-02-102094
Acrylonitrile (ug/kg)	< 120		< 120	< 130	< 120	< 120	< 120
Methylene Chloride (ug/kg)	< 6		< 6	< 6	< 6	< 6	< 6
Ethylbenzene (ug/kg)	97		< 6	< 6	< 6	< 6	< 6
Styrene (ug/kg)	64		< 6	1,500 J	< 6	< 6	< 6
Barium (mg/kg)	100	94	71	121	80	106	73
Moisture (% by wt.)	18.3	18.1	16.7	21.4	14.1	19.6	14.3

Compound	DHR-8B-24-102094	DHR-8D-46-102094	DHR-53D-79-102194	DHR-53D-13-102194	DHR-53D-35-102194	DHR-20B-68-102294	DHR-20D-46-102294
Acrylonitrile (ug/kg)	< 120	< 130	190	< 120	< 120	< 130	< 120
Methylene Chloride (ug/kg)	< 6	< 6	40	< 6	< 6	< 6	< 6
Ethylbenzene (ug/kg)	200	< 6	870	10	120	27	< 6
Styrene (ug/kg)	< 6	< 6	490	< 6	63	53	< 6
Barium (mg/kg)	153	138	129	79	85	120	100
Moisture (% by wt.)	19.8	20.5	19.6	15.2	16.9	20.9	17.0

Compound	DHR-20D-24-102294	DHR-20D-02-102294	DHR-20D-68-102294	DHR-43C-02-102294	DHR-53D-57-102194	DHR-20C-68-102294	DHR-TBLK (Trip Blank)
Acrylonitrile (ug/kg)	< 120	< 110	< 120	< 110	270	< 120	< 100
Methylene Chloride (ug/kg)	< 6	< 6	< 6	< 6	18	< 6	< 5
Ethylbenzene (ug/kg)	< 6	< 6	< 6	< 6	260	< 6	< 5
Styrene (ug/kg)	< 6	< 6	< 6	< 6	300	< 6	< 5
Barium (mg/kg)	68	95	108	101	125	144	NA
Moisture (% by wt.)	15.5	10.9	19.7	10.1	18.0	19.4	NA

APPENDIX A

RESULTS AS REPORTED BY THE LABORATORY

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207774
Collected: 10/22/94 at 09:20 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20A-46-102294 Unspiked Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20A46 SDG#: IRN05-01BK

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	81.3	9.8	mg/kg	100.	12.
9001	Styrene	52.	5.	ug/kg	64.	6.
0111	Moisture	18.3	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:54:03 D 0002 6 0 118283 440405
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2207774
Collected: 10/22/94 at 09:20 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20A-46-102294 Unspiked Grab Soil Sample

Dow Hanging Rock - Ironton, DH Proj. No. 7015.60D
20A46 SDG#: IRN05-01BK

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	79.	5.	ug/kg	97.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2207775
Collected: 10/22/94 at 09:20 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20A-46-102294 Matrix Spike Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20A46 SDG#: IRN05-01MS

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	285.	10.	mg/kg	348.	12.
9001	Styrene	50.	5.	ug/kg	61.	6.
0118	Moisture	18.3	0.5	% by wt.		

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:54:14 D 0002 6 0 118283 440405
603 25.00 00032400 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

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Lancaster, PA 17601-5994
717-656-2301

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Analysis Report

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LLI Sample No. SW 2207775
Collected: 10/22/94 at 09:20 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

OHR-20A-46-102294 Matrix Spike Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20A46 SDG#: IRND5-01MS

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AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

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Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	130.	100.	ug/kg	160.	120.
3440	Methylene Chloride	26.	5.	ug/kg	32.	6.
3458	Ethylbenzene	63.	5.	ug/kg	77.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2207776
Collected: 10/22/94 at 09:20 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

OHR-20A-46-102294 Matrix Spike Duplicate Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20A46 SDG#: IRN05-01MSD

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	267.	10.	mg/kg	327.	12.
9001	Styrene	57.	5.	ug/kg	70.	6.
0118	Moisture	18.3	0.5	% by wt.		

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:54:24 D 0002 6 0 118283 440405
603 25.00 00032400 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
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LLI Sample No. SW 2207776
Collected: 10/22/94 at 09:20 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20A-46-102294 Matrix Spike Duplicate Grab Soil Sample
Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20A46 SOG#: IRN05-01MSD

Account No: 06948
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Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	130.	100.	ug/kg	160.	120.
3440	Methylene Chloride	25.	5.	ug/kg	31.	6.
3458	Ethylbenzene	72.	5.	ug/kg	88.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

36

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2425 New Holland Pike
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717-656-2301

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Analysis Report

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LLI Sample No. SW 2207777
Collected: 10/22/94 at 09:20 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20A-46-102294 Duplicate Grab Soil Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20A46 SDG#: IRND5-01DUP

Account No: 06948
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Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1646	Barium	77.1	9.8	mg/kg	94.	12.
0118	Moisture	18.3	0.5	% by wt.		
0121	Moisture Duplicate	18.1	0.5	% by wt.		

The duplicate moisture value is provided to assess the precision of the moisture test. For comparability purposes, the initial moisture determination is the value used to perform dry weight calculations.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:54:33 D 00D2 6 D 118283 440405
603 25.00 00005100 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

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2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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Analysis Report

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LLI Sample No. SW 2207778
Collected: 10/22/94 at 09:35 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20B-24-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
20B24 SDG#: IRN05-02

CAT. NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
7177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	59.	10.	mg/kg	71.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	16.7	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:54:40 D 0002 6 0 118283 440405
603 25.00 00033600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2207778
Collected: 10/22/94 at 09:35 by DM

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20B-24-102294 Grab Soil Sample

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

Ow Hanging Rock - Ironton, OH Proj. No. 7015.600
20B24 SDG#: IRN05-02

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2210718
Collected: 10/20/94 at 11:55 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8B-46-102094 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

8B-46 SDG#: IRN05-04

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	94.8	9.5	mg/kg	121.	12.
9001	Styrene	1,200.	5.	ug/kg	1,500.	6.
0111	Moisture	21.4	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:52:05 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

44

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2210718
Collected: 10/20/94 at 11:55 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8B-46-102094 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

8B-46 SDG#: IRN05-04

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 130.	130.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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Where quality is a science.

LLI Sample No. SW 2210719
Collected: 10/20/94 at 09:35 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8D-02-102094 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

8D-02 SDG#: IRN05-05

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.D. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	69.	10.	mg/kg	80.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	14.1	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:52:16 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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Analysis Report

Lancaster Laboratories
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LLI Sample No. SW 2210719
Collected: 10/20/94 at 09:35 by OM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BD-02-102094 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

BD-02 SDG#: IRN05-05

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
344D	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

"22"
9-13

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2210720
Collected: 10/20/94 at 09:40 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8D-24-102094 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

8D-24 SOG#: IRN05-06

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	85.	10.	mg/kg	106.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	19.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:52:26 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2210720
Collected: 10/20/94 at 09:40 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8D-24-102D94 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

8D-24 SDG#: IRN05-06

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
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LLI Sample No. SW 2210721
Collected: 10/20/94 at 11:45 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-88-02-102094 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

88-02 SDG#: IRN05-07

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	63.	10.	mg/kg	73.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	14.3	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:52:37 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

50

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

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LLI Sample No. SW 2210721
Collected: 10/20/94 at 11:45 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8B-02-102094 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

8B-02 SDG#: IRN05-07

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

5

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

Lancaster Laboratories
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LLI Sample No. SW 2210722
Collected: 10/20/94 at 12:15 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8B-24-102094 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

8B-24 SDG#: IRN05-08

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	123.	9.8	mg/kg	153.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	19.8	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:52:47 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2210722
Collected: 10/20/94 at 12:15 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-BB-24-102094 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

BB-24 SDG#: IRN05-08

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	160.	5.	ug/kg	200.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
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LLI Sample No. SW 2210723
Collected: 10/20/94 at 09:45 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8D-46-102094 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

8D-46 SDG#: IRN05-09

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	110.	9.5	mg/kg	138.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	20.5	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:53:00 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
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LLI Sample No. SW 2210723
Collected: 10/20/94 at 09:45 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-8D-46-102094 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

8D-46 SDG#: IRN05-09

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 130.	130.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

Lancaster Laboratories
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LLI Sample No. SW 2210724
Collected: 10/21/94 at 14:00 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53D-79-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

53D79 SDG#: IRN05-10

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 30D
Pittsburgh, PA 15276

P.O. SC-941D61-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	104.	10.	mg/kg	129.	12.
9001	Styrene	390.	5.	ug/kg	490.	6.
0111	Moisture	19.6	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:53:10 D 0002 17 Q 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2210724
Collected: 10/21/94 at 14:00 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53D-79-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

53D79 SDG#: IRN05-10

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	150.	100.	ug/kg	190.	120.
3440	Methylene Chloride	32.	5.	ug/kg	40.	6.
3458	Ethylbenzene	700.	5.	ug/kg	870.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

57

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2210725
Collected: 10/21/94 at 13:40 by OM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-530-13-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

53013 SDG#: IRN05-11

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables ISW846/8240A)			See Page 2		
1646	Barium	67.2	9.8	mg/kg	79.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	15.2	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:53:21 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2210725
Collected: 10/21/94 at 13:40 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53[illegible]3-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

53013 SDG#: IRN05-11

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	9.	5.	ug/kg	10.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
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LLI Sample No. SW 2210726
Collected: 10/21/94 at 13:45 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53D-35-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

53D35 SDG#: IRN05-12

Account No: 06948
AWD Technologies, Inc.
Building 111
Penn Center West, Suite 3DD
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	71.	10.	mg/kg	85.	12.
9001	Styrene	52.	5.	ug/kg	63.	6.
0111	Moisture	16.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:53:32 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2210726
Collected: 10/21/94 at 13:45 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53D-35-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

53D35 SDG#: IRN05-12

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	99.	5.	ug/kg	120.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2210727
Collected: 10/22/94 at 09:45 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20B-68-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20B68 SDG#: IRN05-13

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	95.	10.	mg/kg	120.	13.
9001	Styrene	42.	5.	ug/kg	53.	6.
0111	Moisture	20.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:53:44 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Lancaster Laboratories
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LLI Sample No. SW 2210727
Collected: 10/22/94 at 09:45 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-208-68-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20868 SDG#: IRN05-13

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT ND.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 130.	130.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	21.	5.	ug/kg	27.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. SW 2210728
Collected: 10/22/94 at 10:45 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20D-46-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20D46 SDG#: IRN05-14

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	83.	10.	mg/kg	100.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	17.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:53:54 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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LLI Sample No. SW 2210728
Collected: 10/22/94 at 10:45 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20D-46-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20D46 SDG#: IRN05-14

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Lancaster Laboratories
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LLI Sample No. SW 2210729
Collected: 10/22/94 at 10:40 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20D-24-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20D24 SDG#: IRN05-15

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	58.	10.	mg/kg	68.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	15.5	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:54:05 D 0002 17 D 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2210729
Collected: 10/22/94 at 10:40 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20D-24-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20D24 SOG#: IRN05-15

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

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LLI Sample No. SW 2210730
Collected: 10/22/94 at 10:30 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20D-02-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20D02 SOG#: IRN05-16

Account No: 06948
AWD Technologies, Inc.
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Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	84.7	9.5	mg/kg	95.	11.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	10.9	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:54:15 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

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Ramona V. Layman, Group Leader
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LLI Sample No. SW 2210730
Collected: 10/22/94 at 10:30 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20D-02-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20D02 SDG#: IRN05-16

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Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 110.	110.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

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Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

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LLI Sample No. SW 2210731
Collected: 10/22/94 at 10:55 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20D-6B-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20D6B SDG#: IRN05-17

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	87.	10.	mg/kg	108.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
D111	Moisture	19.7	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:54:25 0 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

70

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Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2210731
Collected: 10/22/94 at 10:55 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20D-68-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20D68 SDG#: IRN05-17

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

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LLI Sample No. SW 2210732
Collected: 10/22/94 at 11:00 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-43C-02-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

43C02 SDG#: IRN05-18

Account No: 06948
AWD Technologies, Inc.
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Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	91.	10.	mg/kg	101.	11.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	10.1	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:54:35 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

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Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2210732
Collected: 10/22/94 at 11:00 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-43C-02-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

43C02 SDG#: IRN05-18

Account No: 06948
AWO Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 110.	110.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

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Where quality is a science.

LLI Sample No. SW 2210733
Collected: 10/21/94 at 13:50 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53D-57-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

53057 SOG#: IRN05-19

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	AS RECEIVED UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	102.	10.	mg/kg	125.	12.
9001	Styrene	250.	5.	ug/kg	300.	6.
0111	Moisture	18.0	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:54:46 D 0002 17 0 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

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LLI Sample No. SW 2210733
Collected: 10/21/94 at 13:50 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-53D-57-102194 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

53057 SDG#: IRN05-19

Account No: 06948
AWD Technologies, Inc.
Building III
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Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	220.	100.	ug/kg	270.	120.
3440	Methylene Chloride	15.	5.	ug/kg	18.	6.
3458	Ethylbenzene	210.	5.	ug/kg	260.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
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Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

Analysis Report

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LLI Sample No. SW 2210734
Collected: 10/22/94 at 10:20 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-68-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20C68 SDG#: IRN05-20*

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
1177	Purgeables (SW846/8240A)			See Page 2		
1646	Barium	116.	9.6	mg/kg	144.	12.
9001	Styrene	< 5.	5.	ug/kg	< 6.	6.
0111	Moisture	19.4	0.5	% by wt.		

"Moisture" represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius.

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Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
05:54:56 D 0002 17 D 118283 441106
603 25.00 00034600 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

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Where quality is a science.

LLI Sample No. SW 2210734
Collected: 10/22/94 at 10:20 by DM

Submitted: 10/24/94 Reported: 11/14/94
Discard: 1/14/95

DHR-20C-68-102294 Grab Soil Sample
Dow Hanging Rock - Ironton, OH

20C68 SDG#: IRN05-20*

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-941061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	AS RECEIVED LIMIT OF QUANTITATION	UNITS	DRY WEIGHT RESULTS	DRY WEIGHT LIMIT OF QUANTITATION
Purgeables (SW846/8240A)						
3439	Acrylonitrile	< 100.	100.	ug/kg	< 120.	120.
3440	Methylene Chloride	< 5.	5.	ug/kg	< 6.	6.
3458	Ethylbenzene	< 5.	5.	ug/kg	< 6.	6.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
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Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations.

Analysis Report

Lancaster Laboratories
Where quality is a science.

LLI Sample No. WW 2207779
Collected:

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-TBLK Trip Blank Water Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
TBSDH SDG#: IRN05-03BL

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
1508	Purgeables (SW846/8240A)			See Page 2
9001	Styrene	< 5.	5.	ug/l

1 COPY TO AWD Technologies, Inc. ATTN: Mr. Kris McCoskey
1 COPY TO Data Package Group

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301
04:54:50 D 0002 6 0 118283 440405
603 0.00 00027000 ASR000

Respectfully Submitted
Ramona V. Layman, Group Leader
ICP Metals/Leachates

42

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717-656-2301

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Analysis Report

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LLI Sample No. WW 2207779
Collected:

Submitted: 10/25/94 Reported: 11/14/94
Discard: 1/14/95

DHR-TBLK Trip Blank Water Sample

Dow Hanging Rock - Ironton, OH Proj. No. 7015.600
TBSDH SDG#: IRN05-03BL

Account No: 06948
AWD Technologies, Inc.
Building III
Penn Center West, Suite 300
Pittsburgh, PA 15276

P.O. SC-94-1061-COM
Rel.

CAT NO.	ANALYSIS NAME	AS RECEIVED RESULTS	LIMIT OF QUANTITATION	UNITS
Purgeables (SW846/8240A)				
3496	Acrylonitrile	< 100.	100.	ug/l
3497	Methylene Chloride	< 5.	5.	ug/l
3526	Ethylbenzene	< 5.	5.	ug/l

The GC/MS volatile sample was preserved with 1 + 1 HCl to pH < 2.

Questions? Contact your Client Services Representative
Eileen R. Hostetler at (717) 656-2301

Respectfully Submitted
Michele McClarin, B.A.
Group Leader, GC/MS Volatiles

Lancaster Laboratories, Inc.
2425 New Holland Pike
Lancaster, PA 17601-5994
717-656-2301

See reverse side for explanation of symbols and abbreviations

APPENDIX B

SUPPORT DOCUMENTATION

SOIL VOLATILE SURROGATE RECOVERY

2B

LAB NAME: LANCASTER LABS SDG No: IRN05

LEVEL: LOW

	EPA SAMPLE NO.	S1 (DCE) #	S2 (TOL) #	S3 (BFB) #	OTHER	TOT OUT
01	20A46	96	100	97		
02	20A46MS	100	101	104		
03	20A46MSD	102	103	100		
04	20B24	101	101	102		
05	8B-46	94	103	75		
06	8B-46DL	95	101	116		
07	8D-02	98	110	94		
08	8D-24	94	100	100		
09	8B-02	97	104	98		
10	8B-24	97	104	105		
11	8D-46	94	98	98		
12	53D79	94	96	97		
13	53D79DL	97	96	99		
14	53D13	95	99	98		
15	53D35	99	104	102		
16	20B68	93	97	99		
17	20D46	92	99	95		
18	20D24	96	103	101		
19	20D02	93	102	90		
20	20D68	92	100	97		
21	43C02	94	100	94		
22	53D57	94	102	99		
23	20C68	94	100	99		
24						
25	LAB QC					
26	VBLKK03	99	99	98		
27	VBLKK08	97	98	100		
28	VBLKK09	91	97	96		
29	LCSLK70	102	101	98		

				QC LIMITS
S1	(DCE)	=	1,2-Dichloroethane-d4	70 - 121
S2	(TOL)	=	Toluene-d8	81 - 117 84-138
S3	(BFB)	=	4-Bromofluorobenzene	74 - 121 59-113

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

Lancaster Laboratories, Inc. • 2425 New Holland Pike, Lancaster, PA 17601-5994 • 717-656-2301 • Fax: 717-656-2681

Lancaster Laboratories, Inc.
GC/MS Volatiles Matrix Spike/Spike Duplicate Recoveries

Unspiked: ^KCV01	Matrix spike: ^KCV02	Spike Duplicate: ^KCV03
20A46 2207774	20A46MS 2207775	20A46MSD 2207776
Method: SPECIALS BY 1177	Matrix/Level: SL	Batch: K943021BC
Instrument: HP03973	Dilution Factor: 1.0	% Moisture: 18

COMPOUND NAME	SPIKE LEVEL	US CONC UG/KG	MS CONC UG/KG	MSD CONC UG/KG	MS REC %	MSD REC %	RPD %	RANGE LOWER-UPPER	IN SPEC
Methylene Chloride	24.39	2.31	31.31	30.08	119	114	4	1-221	YES
Acrylonitrile	182.93	0.00	164.05	156.09	90	85	6	51-138	YES
Ethylbenzene	24.39	96.92	77.31	87.49	-80	-40	67	37-162	NO
Styrene	24.39	63.34	61.16	70.03	-9	27	-400	74-136	NO

N/C = Could not calculate

Lab Chronicle: _____ Ent. by _____.

_____ Ver. by _____.

_____.

* %RPD for this compound exceeds method specified limit.

DOW ENVIRONMENTAL, INC.

DOW-HANGING ROCK

SDG# IRN05-01BK

FIELD DUPLICATE RESULTS

Compound	DHR-20A-46-102294	DHR-20A-46-102294Dup	Control Limit
Acrylonitrile (ug/kg)	< 120	NA	
Methylene Chloride (ug/kg)	< 6	NA	
Ethylbenzene (ug/kg)	97	NA	
Styrene (ug/kg)	64	NA	
Barium (mg/kg)	100	94	+/- 50%
Moisture (% by wt.)	18.3	18.1	+/- 50%

SUPPLEMENTAL PHASE IV SAMPLING REPORT

FOR

FORMER DRUM STORAGE AREA HANGING ROCK PLANT IRONTON, OHIO

PREPARED FOR

THE DOW CHEMICAL COMPANY

PREPARED BY

DOW ENVIRONMENTAL INC.
PITTSBURGH, PENNSYLVANIA

PROJECT NUMBER 7015.500

MARCH 1996

TABLE OF CONTENTS

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APPENDIX

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B	**CHAIN-OF-CUSTODY FORM**	**B-1**
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2 Organic Soil Vapor and Laboratory Analytical Results from Soil Borings along the Process Sewer Line North of the Former Drum Storage Area

TABLES

NUMBER

1 Organic Vapor Headspace Concentrations for the Soil Boring Samples along the Process Sewer Line as a Function of Depth
2 Soil Volatile Organic Compounds (VOCs) Concentrations for Samples Along the Process Sewer Line
3 Concentrations of Barium in Soil for Samples Along the Process Sewer Line

1.0 INTRODUCTION

This report, prepared by Dow Environmental Inc. (DEI), presents the results of Supplemental Phase IV soil sampling conducted adjacent to the old sewer line to the north of the Former (also referred to as Old) Drum Storage Area at The Dow Chemical Company (Dow) Hanging Rock plant in Ironton, Ohio. This phase of sampling performed during January of 1996 supplements previous sampling activities in and around the Former Drum Storage Area, with the most recent previous sampling performed during October 1994. In addition, this phase of sampling was performed in accordance with the DEI's October, 1995 Addendum to Sampling and Analysis Plan - Additional Sampling for Old Drum Storage Area, Hanging Rock Plant, Ironton, Ohio, and included the additional requirements requested by the Ohio Environmental Protection Agency (OEPA) in their October 16, 1995 and November 17, 1995 letters to Dow.

1.1 Background of Previous Field Investigations

Four phases of field sampling and analysis have previously been conducted at and near the Former Drum Storage Area. Phase I, performed in May 1992, consisted of surface soil sampling at 28 locations to define the horizontal extent of acrylonitrile (AN), ethylbenzene (EB), methylene chloride (MC), and styrene (ST). Phase II, also performed in 1992, involved soil excavation and confirmation sampling of two 16 foot by 16 foot areas. Phase III was performed in February 1993 as part of an effort outlined in the OEPA approved Closure Plan for the Former Drum Storage Area. During Phase III, headspace sampling was performed throughout the Former Drum Storage Area at various depths to define the vertical and horizontal extent of constituents in soil.

In May 1993, the Ohio Environmental Protection Agency (OEPA) indicated that Dow had agreed to amend the approved Closure Plan to include the February 1993 headspace data (OEPA, 1993a). The OEPA indicated that among other things, Dow should include a demonstration that the subsurface contamination could have been caused by a source other than the Former Drum Storage Area. A pipeline investigation was subsequently performed on July 21, 1993. This study indicated there was evidence that the process sewer line underlying the Former Drum Storage Area could be the source of AN, ST, and EB in soil. OEPA accepted Dow's interpretation of the subsurface contamination source on August 25, 1993 (OEPA, 1993b). At that time, OEPA recommended that

Dow submit a Closure Plan Modification. The Closure Plan Modification was submitted in September 1993 (AWD, 1993).

Comments on the Closure Plan Modification were received from OEPA, Division of Hazardous Waste Management (DHWM) in August 1994. Draft revisions to the Closure Plan Modification were submitted to the OEPA on August 29, 1994 (AWD, 1994). Following review of the draft revisions, the OEPA requested that the extent of contamination of the four previously-identified volatile organics plus barium be more closely defined. The Phase IV soil sampling was performed as approved by the OEPA DHWM. Samples were also collected to coincide with former headspace sampling to confirm the vertical extent of constituents in soil.

Based on the Phase IV investigation findings, OEPA concluded that additional sampling was required to assess the horizontal and vertical distribution of constituents in soil adjacent to the old sewer line to the north of the Former Drum Storage Area.

1.2 Sampling and Analysis Objective

This sampling and analysis event was designed to respond to the OEPA concerns regarding the Former Drum Storage Area and the process sewer pipe line. The DEI field activities included:

- Collection of additional soil samples to define the northern extent of constituents along the sewer line. Constituents analyzed for were AN, EB, MC, ST, and Barium.

- Collection of soil samples at location 53C to determine the vertical extent of constituents. Specifically, collection of three consecutive samples that resulted in non-detect field screening to include a confirmatory sample taken from the bottom of the boring and to be analyzed at an offsite laboratory.

- Interpretation of soil data to determine the extent of constituent concentration and whether constituents in soil reached groundwater.

To achieve these objectives, five soil borings were installed adjacent to the process sewer line at locations defined in DEI's October, 1995 Addendum to Sampling and Analysis Plan (SAP) (DEI, 1995a) (see Appendix A). The soil boring locations are shown on Figure 1. Soil samples

collected from the borings were field screened until low level or non-detect results were achieved at or below minimum prescribed sample depths outlined in the addendum to the SAP. Based on field screening results, confirmatory samples were collected for each soil boring location to determine the concentration of the target constituents in soil.

2.0 FIELD ACTIVITIES

This section details the field methods and procedures used to implement the additional sampling program for the process sewer line area to the north of the Old Drum Storage Area. The field work was performed on January 9 and 10, 1996. Philip Environmental Services Corporation of Groveport, Ohio was subcontracted to provide subsurface drilling services for the collection of soil samples. Ross Analytical Services, Inc. of Strongville, Ohio provided analytical support for the project. Figure 1 depicts the locations of soil borings adjacent to the process sewer line.

The pipeline has a north-south orientation and intersects the entire Former Drum Storage Area on the east side of the RCRA Hazardous Waste Storage Building. A series of manholes are connected to the pipeline along its length. To the north, the pipeline exits the Former Drum Storage Area and continues in a northerly direction beneath the plant roadway. The supplemental sampling was conducted along the pipeline in approximately 20 foot intervals between the northeast corner of the hazardous waste storage building and the manhole (M.H. № 3) located approximately 100 feet away as shown in Figure 1.

2.1 Drilling and Soil Sample Collection

A truck-mounted geotechnical drilling rig (CME-75) capable of hollow-stem auguring techniques was used to obtain discrete soil samples at the designated soil boring locations. Sample collection commenced at 6 feet below ground surface (ft-bgs) near the base of the process sewer line. Soil samples were collected in two-foot increments with clean split-barrel samplers according to ASTM Method D1586 (Penetration Test and Split-Barrel Sampling of Soils) procedures. Continuous sampling was performed in each of the soil borings from the initial sampling depth to a minimum depth of 14 ft-bgs. Samples obtained from greater depths were collected at the discretion of the supervising DEI geologist based on field screening results.

The retrieved soil samples were visually inspected and logged by the supervising DEI geologist. The samples were field-classified according to the Unified Soil Classification System (USCS) with respect to soil type, color, grain size, texture, and moisture content. Evidence of staining and/or odors was also documented.

Hollow stem auger cuttings and discarded soil samples were collected and placed in labeled storage containers. The containers were sealed and staged onsite pending further characterization. Each completed soil boring was immediately sealed to ground surface with a bentonite/cement grout mix by tremie grouting methods.

2.2 Field Screening Procedures

After logging, a representative portion of each soil sample was retained for field screening of organic vapors by headspace analysis. The soil was placed into a clean 8-ounce sample jar and filled to one-half capacity. The sample jar was sealed with aluminum foil and then warmed to room temperature before screening. A photoionization detector (10.2 eV) was used to measure the headspace vapor concentration by inserting the instrument probe through the foil into the headspace volume. The maximum instrument reading was then recorded for each analyzed sample.

2.3 Sample Preparation

Soil sample collection proceeded at each boring location until a low level or nondetectable headspace result was achieved at or below the minimum proposed sample depth outlined in the SAP. Soil sample collection near location 53C proceeded in a similar manner. However, in this case, samples were collected for three consecutive sampling intervals of 18-20, 20-22, and 22-24 ft-bgs below the last detection point. A confirmatory soil sample was taken from the bottom of each boring and sent for laboratory analysis.

The confirmation samples were placed in clean laboratory-supplied sample jars and were secured with teflon-lined lids. The sample jars were labeled with the following information:

- Sample number, location, and depth interval (soil boring locations were designated as SB, i.e. SB-62 means soil boring at location 62).
- Date and time collected.
- Sampler's initials.
- Project number.
- Compounds for analysis.

The samples jars were stored in a cooler and chilled to below 4 degrees C for preservation and transport to the analytical laboratory. Chain-of-custody (COC) documentation followed standard

procedures with the original forms accompanying the samples to the laboratory. Copies are retained in DEI files and are included in Appendix B of this report.

2.4 Decontamination Procedures

The drilling rig, downhole tools, and sampling equipment were decontaminated to ensure the integrity of the soil sampling event. A temporary decontamination pad was erected adjacent to the assessment area. The downhole tools used to penetrate the subsurface were cleaned with a high pressure, hot water washer prior to drilling, in-between soil boring locations, and before demobilization from the site. The split-barrel samplers were manually washed after each use with a non-phosphate detergent wash, followed by a potable water rinse, and finally a deionized water rinse. The decontamination fluids were collected and transferred to onsite storage containers. The containers were labeled, sealed, and staged onsite pending further characterization.

3.0 INVESTIGATION RESULTS

The investigation results characterizing subsurface conditions adjacent to the process sewer line are summarized in this section including geologic conditions, field screening and laboratory results.

3.1 Site Geologic Conditions

The five soil borings collected adjacent to the process sewer line provided geologic information for the assessment area. The lithologic logs generated while drilling the soil borings were used for geologic interpretation. The soil boring logs are included in Appendix C of this report.

The soil borings were advanced to depths ranging from 14 feet in soil boring SB-62 to 24 feet in borings SB-53CR and SB-60. The lithologic logs reveal that the process sewer line is buried within an unconsolidated clayey silt to silty clay formation underlain by a gravely sand layer. This data concurs with the general understanding of site geologic conditions for the Dow Hanging Rock Plant.

The upper silty clay to clayey silt layer is typically described as soft, light brown to brown, and moist. This layer extended from directly beneath the asphalt surface to a maximum depth of 12 feet (SB-53CR, SB-60, and SB-61). Distinct gray mottling occurred within the uppermost 8 feet of this horizon. The base of the clayey silt to silty clay layer increased in elevation to the north from 12 ft-bgs in soil boring SB-53CR to 11.5 ft-bgs in SB-63 located adjacent to the manhole.

A well-defined contact separated the upper clayey silt to silty clay layer from the underlying gravely sand formation. The gravely sand was typically characterized as medium dense, well graded, light brown, and moist. Drilling was terminated before the base of this formation was encountered.

Saturated subsurface conditions were not observed during the assessment and the soil borings were completed entirely within the unsaturated zone.

3.2 Field Screening Results

A total of 31 soil samples were field screened for organic vapor headspace concentrations during this sampling program. Table 1 summarizes the headspace organic vapor data for each boring location

by depth, and Figure 2 illustrates these results along the north-south cross-section of the process sewer line area.

The data in Table 1 and Figure 2 reveal the following:

- The highest organic vapor headspace concentration (2559 ppm) was detected at a depth of 6-8 ft-bgs in soil boring SB-63, which was located east of M.H. Nº 3. The second highest organic vapor headspace concentration (1004 ppm) was detected at a depth of 10-12 ft-bgs in soil boring SB-53CR, just north of the Old Drum Storage Area.

- Organic vapor headspace concentrations generally decreased with depth in soil borings SB-63 and SB-62.

- Organic vapor headspace concentrations increased to a depth of 10-12 ft-bgs in soil borings SB-61, SB-60, and SB-53CR. Beyond that, they showed a sharp decrease with depth.

- The high organic vapor headspace concentrations are predominantly confined to the clayey silt to silty clay layer overlaying the gravely sand formation, i.e. to a depth of 11-12 ft-bgs.

- The organic vapor headspace concentrations noticeably diminished beneath the contact of the two formations within the gravely sand.

- The organic vapor headspace concentrations were near or at the detection limit at depths of 20-24 ft-bgs for soil borings SB-63, SB-60, and SB-53CR. Soil borings SB-62 and SB-61 showed the same behavior at a shallower depth, i.e. 14-16 ft-bgs.

- Headspace of soil samples collected for three consecutive sampling intervals (18-20, 20-22, and 22-24 ft-bgs) resulted in non-detected organic vapors in SB-53C.

It should be emphasized that no saturated zone, nor groundwater were encountered in any soil boring at any depth interval. In particular, SB-53CR, the location which exhibited the highest constituent

concentrations in soil at the greatest depth sampled in the previous investigation, did not show any sign of groundwater to a depth of 24 ft-bgs (DEI, 1995b). This, together with the non-detected or low-detected organic vapors, eliminates the concern about constituents migration to the groundwater.

The field screening results indicate that the constituents released from the process sewer line are essentially retained within the silt and clay soils that surround the sewer line. The laboratory analytical data support this statement.

3.3 Laboratory Analysis

A total of five soil samples were submitted for analysis by U.S. EPA SW-846 Method 8240A (U.S. EPA, 1986) which included testing for acrylonitrile, ethylbenzene, methylene chloride, and styrene. The samples were also analyzed for barium by U.S. EPA SW-846 Method 6010A (U.S. EPA, 1986).

As previously described, one sample collected from the bottom of each soil boring was submitted for laboratory analysis. All soil sample results were reported with below Quantitation Limits concentrations for the volatile compound analyses, with the exception of acetone. Acetone was detected in three of the five samples. Acetone was not detected in the laboratory blank; however, this compound is a common laboratory contaminant. The analytical data were validated by DEI in accordance with the U.S. EPAs Region III Modifications to National Functional Guidelines for Organic Data Review (June 1992). The data validation letter and the results as reported by the laboratory are included in Appendix D. The data validation letter contains a table summarizing all analytical results and detection limits.

Barium was detected in each of the samples and ranged from 30.4 milligrams per kilogram (mg/kg) in soil boring SB-53CR to 63 mg/kg in soil boring SB-62. These results are at the low end of background barium concentrations (30-700 ppm) for soil for this region in Ohio (U.S. Dept. of Interior, 1971).

4.0 SUMMARY

The data shown in Figure 2 visually portrays the extent of constituents in soil. This figure shows the constituent concentrations in soil are confined primarily to the clayey silt to silty clay layer with a migration of small quantities into the gravely sand layer. The data show the vertical extent of constituents ranges from about 12 to 25 ft-bgs. Constituent concentrations to the north of the former drum storage area are associated with previous leaks from the process sewer line.

In addition, the soil borings did not detect any saturated zone or groundwater in any of the borings. This is also true for SB-53CR at a depth where three consecutive sampling intervals revealed non-detected organic vapors in headspace and that was confirmed with below quantitation limits for the laboratory soil sample. This eliminates the issue of constituent migration to groundwater and the need for installation of groundwater monitoring wells.

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TABLES

TABLE 1

ORGANIC VAPOR HEADSPACE CONCENTRATIONS
for the
SOIL BORING SAMPLES ALONG THE
PROCESS SEWER LINE AS A FUNCTION OF DEPTH

Depth (ft-bgs)	Organic Vapor Headspace Concentration (ppm) at the Indicated Soil Boring				
	SB-53CR	SB-60	SB-61	SB-62	SB-63
6-8	85	175	78	34	2559
8-10	226	494	102	36	439
10-12	1004	532	741	ND	48
12-14	7.3	290	ND	ND	7.3
14-16	ND	NM	9.7		7.3
16-18	34	NM			4.8
18-20	ND	78			4.8
20-22	ND	NM			
22-24	ND	7.3			

TABLE 2
SOIL VOLATILE ORGANIC COMPOUND (VOC) CONCENTRATIONS FOR SAMPLES ALONG THE PROCESS SEWER LINE

	Volatile Organic Concentrations (µg/kg) at Indicated Soil Boring									
	SB-63		SB-62		SB-61		SB-60		SB-53CR	
CHLOROMETHANE	10	U	10	U	10	U	10	U	10	U
BROMOMETHANE	10	U	10	U	10	U	10	U	10	U
VINYL CHLORIDE	10	U	10	U	10	U	10	U	10	U
CHLOROETHANE	10	U	10	U	10	U	10	U	10	U
METHYLENE CHLORIDE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
ACETONE	23		15		10	U	10	U	22	
CARBON DISULFIDE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1-DICHLOROETHENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1-DICHLOROETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2-DICHLOROETHENE (total)	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
CHLOROFORM	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2-DICHLOROETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-BUTANONE	10	U	10	U	10	U	10	U	10	U
1,1,1-TRICHLOROETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
CARBON TETRACHLORIDE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
VINYL ACETATE	10	U	10	U	10	U	10	U	10	U
BROMODICHLOROMETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1,2,2-TETRACHLOROETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2-DICHLOROPROPANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
trans-1,3-DICHLOROPROPENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
TRICHLOROETHENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
DIBROMOCHLOROMETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1,2-TRICHLOROETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
BENZENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
cis-1,3-TRICHLOROPROPENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-CHLOROETHYL VINYL ETHER	200	U	200	U	200	U	200	U	200	U
BROMOFORM	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-HEXANONE	10	U	10	U	10	U	10	U	10	U
4-METHYL-2-PENTANONE	10	U	10	U	10	U	10	U	10	U
TETRACHLOROETHENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
TOLUENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
CHLOROBENZENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
ETHYLBENZENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
STYRENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
XYLENES (total)	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
SAMPLING DEPTH	Sampled from 18-20 ft.		Sampled from 13-14 ft.		Sampled from 14-16 ft.		Sampled from 22-24 ft.		Sampled from 22-24 ft.	

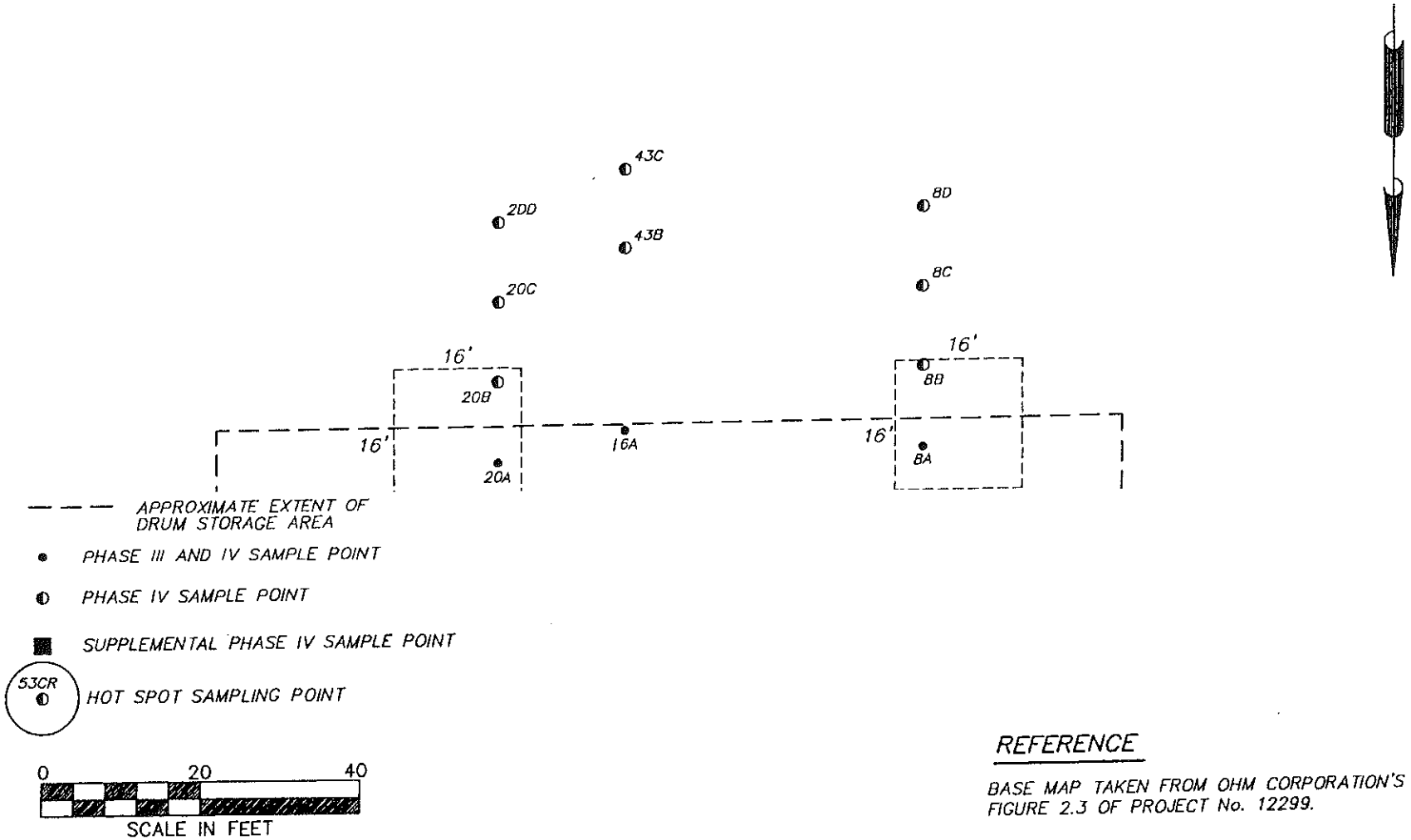
U = Nondetected, Number indicates detection limit

TABLE 3
CONCENTRATIONS OF BARIUM IN SOIL
FOR SAMPLES ALONG THE PROCESS SEWER LINE

	BariumConcentrations (µg/kg) at Indicated Soil Boring				
	SB-63	**SB-62**	**SB-61**	**SB-60**	**SB-53CR**
BARIUM	43.1	63	48.8	37.9	30.4
SAMPLING DEPTH	Sampled from 18-20 ft.	Sampled from 13-14 ft.	Sampled from 14-16 ft.	Sampled from 22-24 ft.	Sampled from 22-24 ft.

FIGURES

FILE: \SHARED\DOW\HANGROCK\7015-004



REFERENCE

BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

Dow®

Dow Environmental

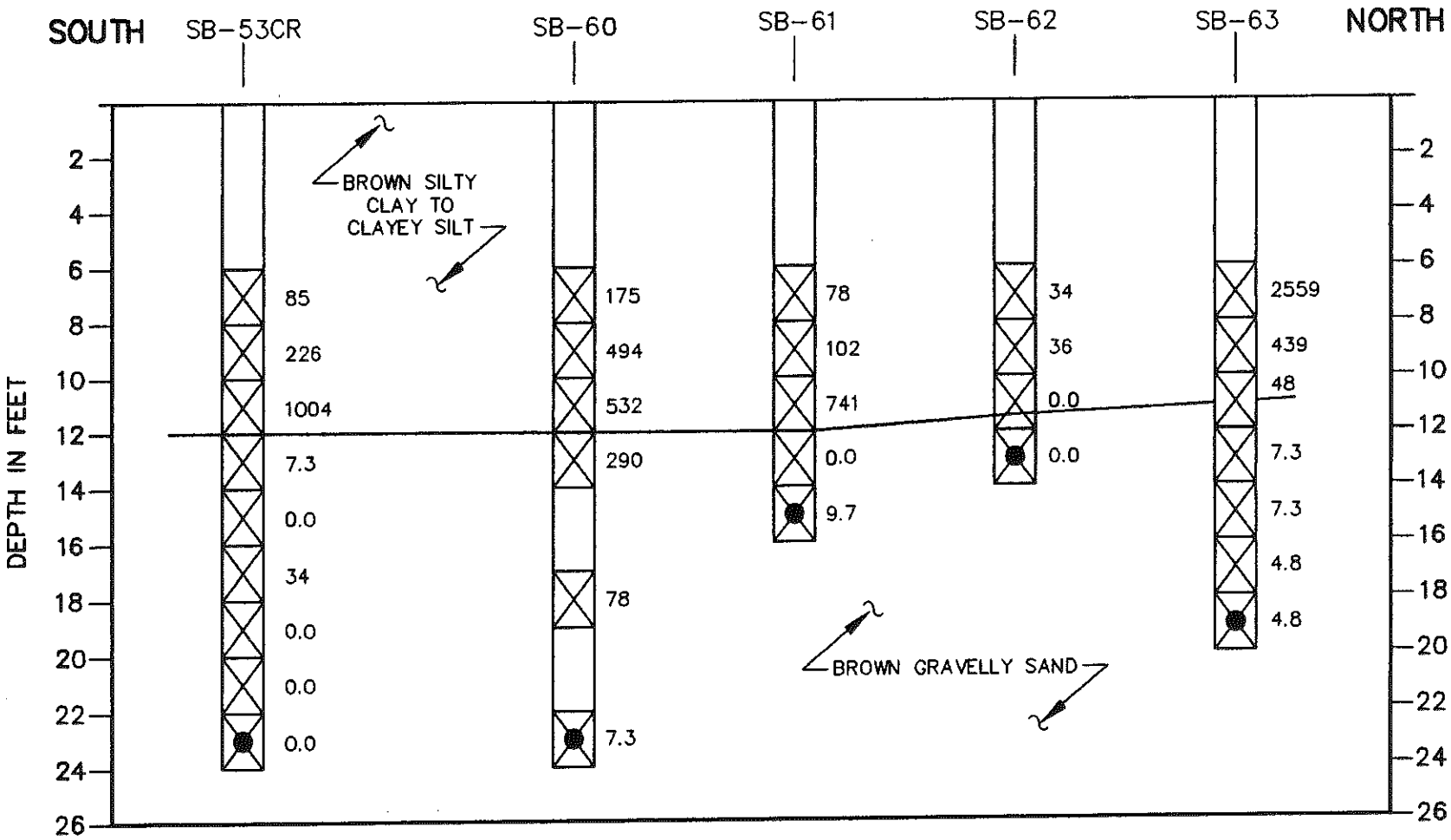
SUPPLEMENTAL PHASE IV SAMPLE LOCATIONS

HANGING ROCK CLOSURE — IRONTON, OH

CLIENT: THE DOW CHEMICAL COMPANY	JOB NUMBER: 7015-500	
SCALE: AS SHOWN	FIGURE NUMBER 1	REV 0

0002020906KG

FILE: \7015\7015-003



LEGEND

7.3 SAMPLE INTERVAL AND HEADSPACE ORGANIC VAPOR RESULT (ppm)

LABORATORY ANALYTICAL SAMPLE RESULT OF NON-DETECT

SB SOIL BORING

0 15 30

SCALE IN FEET

0 0
2 1
2 2
3 3
9 9
6 6
K G
G W

DOW

Dow Environmental

ORGANIC SOIL VAPOR & LABORATORY ANALYTICAL RESULTS FROM SOIL BORINGS ALONG THE PROCESS SEWER LINE NORTH OF THE FORMER DRUM STORAGE AREA

HANGING ROCK CLOSURE IRONTON, OH

CLIENT: THE DOW CHEMICAL COMPANY		JOB NUMBER: 7015-500	
SCALE: AS SHOWN	FIGURE NUMBER 2		REV 0

APPENDIX A

ADDENDUM TO SAMPLING AND ANALSIS PLAN

ADDENDUM TO SAMPLING AND ANALYSIS PLAN
ADDITIONAL SAMPLING

FOR

OLD DRUM STORAGE AREA

HANGING ROCK PLANT
IRONTON, OHIO

Prepared for:
THE DOW CHEMICAL COMPANY

Prepared by:
DEI ENVIRONMENTAL, INC.
PITTSBURGH, PENNSYLVANIA

PROJECT NUMBER 7015-500

OCTOBER 1995

Introduction

This document is an addendum to the Sampling and Analysis Plan dated September 1994. This addendum describes soil, and if necessary groundwater, sampling that will aid in defining the horizontal and vertical extent of contamination adjacent to the sewer line north of the Old Drum Storage Area at The Dow Chemical Company, Hanging Rock Plant in Ironton, Ohio. Additionally, vertical delineation will be conducted at one location.

All soil samples collected during this phase of investigation will be continuous. Soil samples collected during this phase will be analyzed for acrylonitrile (AN), styrene (ST), methylene chloride (MC), ethyl benzene (EB), and barium (Ba).

Sampling Methods, Locations, and Number

Soil samples will be collected every 20 feet horizontally along the sewer line up to but not past the manhole located 100 feet north of the Old Drum Storage Area. This area has been identified on Figure 1. Samples will be collected from an interval starting at the base of the pipe 6 feet below the ground surface to a depth of 11 feet or until headspace readings indicate non-detection (ND), or until soil sample concentrations are below risk based criteria. In addition, samples will be collected along the sewer line where the video indicates possible leakage if sampling has not already been performed in accordance with the above referenced frequency.

Soil sampling to determine vertical delineation will be performed beneath the sewer line at hot spot 53-C defined during previous investigative activities. At this location, PID readings will be taken on headspace samples continuously until ND levels are reached or until sample concentrations are below risk based criteria. A soil sample will then be collected and sent for laboratory analysis. If soil samples headspace indicate contamination through the clay layer, sampling and associated PID headspace analyses will continue through the underlying sand and gravel layers. In this case, a soil profile will be developed and if possible, a ground water sample will be collected and analyzed. This sampling location is identified on Figure 1. Soil sampling will terminate upon encountering the watertable or after headspace readings indicate non-detection (ND) for three consecutive samples.

If high levels of constituents are found in the soils at the seasonal high water table, groundwater monitoring wells will be installed to monitor the groundwater quality and determine the groundwater's depth and direction of flow. If necessary, monitoring well installation will be in

accordance with Section 3.3 of the Phase IV Sampling Report and Management Plan dated February 1995.

Sampling will be conducted continuously in the test borings using a split spoon sampler. Standard penetration tests in accordance with ASTM Specification D1586 will be performed while obtaining each sample. All samples collected will be containerized for either field headspace analysis or laboratory analysis. The field headspace samples will be containerized in clean 8 ounce mason jars approximately ½ full. The headspace samples will be allowed to equilibrate at room temperature for approximately 45 minutes prior to obtaining a reading.

Readings of contained volatile gases within the jars will be then measured using a photo ionization detector (PID) with a 10.2 electron volt lamp. The PID will be calibrated using isobutylene, a benzene equivalent substance. All headspace readings will be recorded and submitted in the final report.

All candidate laboratory samples collected will be containerized and kept at a temperature of approximately 4 degrees C until shipped to the analyzing laboratory. Chain of custody procedures and sample holding time guidelines will be followed throughout the sample acquisition, handling, and transporting process.

All borings will be logged in accordance with the Unified Soil Classification System (USCS) by the onsite hydrogeologist at the time of sample collection. The onsite hydro geologist will pay particular attention in defining moist or saturated zones as well as obvious contamination when constructing boring logs. All boring logs will be submitted as part of the final report.

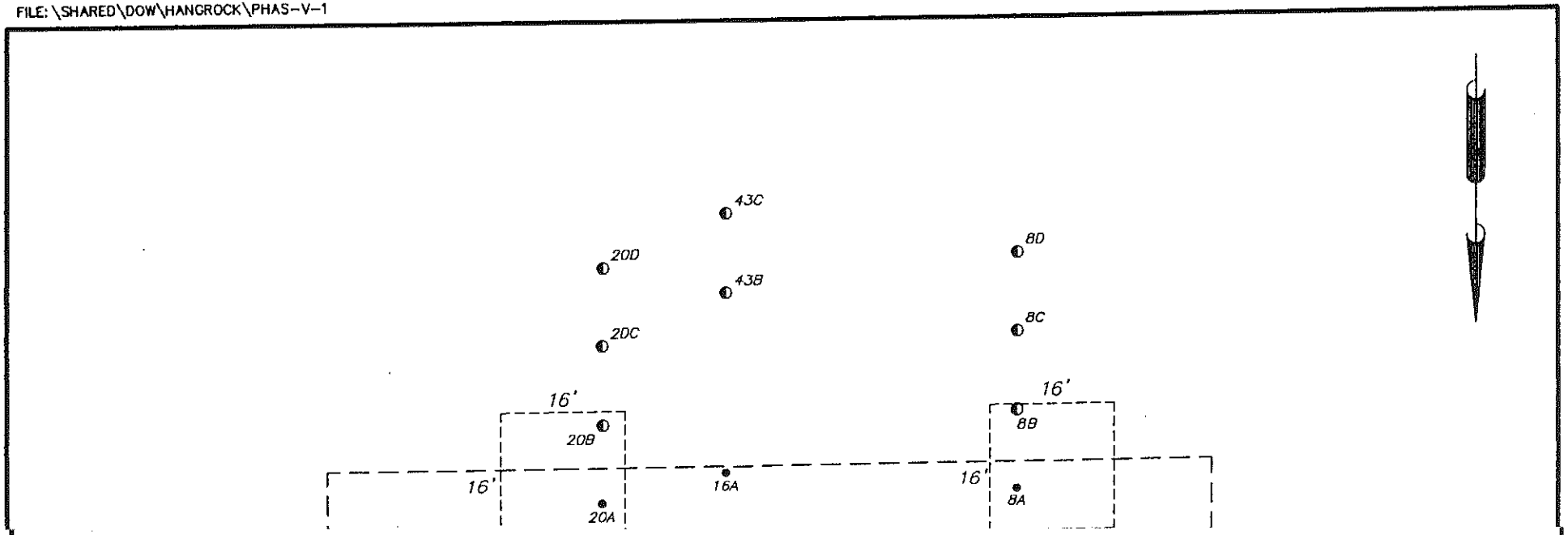
Upon completion of drilling, each borehole will be sealed with a cement/bentonite grout. Wastes generated from investigation activities will be containerized onsite in sealed drums for future disposal pending waste characterization.

Sample identification, equipment decontamination, and analytical and QA/QC methods will be performed in accordance with procedures outlined in the Sampling and Analyses Plan for additional sampling dated September 1994.

Field sampling activities will be scheduled to commence within 2 weeks, but no sooner than 5 working days, after verbal concurrence with this plan by OEPA. Field activities are anticipated

to be completed within 3 days of initiation. Laboratory results will be provided within 14 working days of receipt by the laboratory.

FILE: \SHARED\DOW\HANGROCK\PHAS-V-1



LEGEND

- APPROXIMATE EXTENT OF DRUM STORAGE AREA
- PHASE IV SAMPLE POINT
- PHASE III AND IV SAMPLE POINT
- PHASE IV SAMPLE POINT

0 20 40
SCALE IN FEET

REFERENCE

BASE MAP TAKEN FROM OHM CORPORATION'S FIGURE 2.3 OF PROJECT No. 12299.

Dow®
Dow Environmental

SUPPLEMENTAL PHASE IV SAMPLE LOCATIONS

HANGING ROCK CLOSURE — IRONTON, OH

CLIENT: THE DOW CHEMICAL COMPANY	JOB NUMBER: 7015-500	
SCALE: AS SHOWN	FIGURE NUMBER 5	REV 1

0120231999 65KRGTH

APPENDIX B

CHAIN-OF-CUSTODY FORM

ROSS® Ross Analytical Services, Inc.
16433 Foltz Industrial Parkway • Strongsville, Ohio 44136
(216) 572-3200 • Fax (216) 572-7620 • 1-800-325-7737

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Page ___ of ___

Report to: MARK LENTZ
Dow Environmental, Inc.
Penn Center West, Bldg 3, Suite 300
Pittsburgh, PA 15276
Telephone: (412) 788-2717

Lab Contact ___
Purchase Order No. ___
Project Reference Dow Hanging Rock 7015.500

Bill to: ___

ONE CONTAINER PER LINE

	Sample ID	Sample Type/Description	Date Collected	Time Collected	Container Type	Pre-servative	Required Tests	Condition on Receipt (Lab)
DHR-	SB63-1820	Soil	1/10/96	1445	Glass	—	Volatile Organics (8240) / Barium	4°C
DHR-	SB62-1214		"	1645		—	per JS analyze	
DHR-	SB61-1416		1/11/96	0955		—	by LeUCA, KEX	
DHR-	SB60-2224		1/11/96	1240		—	1/12/96	
DHR-	SB53CR-2224		1/11/96	1525		—		

Possible Hazard Identification: Non-hazard Flammable Skin Irritant Other

Turnaround Time Required: Normal 14 Day Rush Report Required By

1. Relinquished by Signature/Affiliation [signature] Date/Time 1/11/96 1630
2. Relinquished by Signature/Affiliation Date/Time

Sample Disposal: Return to Client (Disposal by Lab) Archive (mos)

QA Requirements:

1. Received by Signature/Affiliation FEDEX Date/Time 1/11/96 - 1700
2. Received by Signature/Affiliation Kendra Schoole Date/Time 1/12/96 1130

Special Instructional Comments:
AB # 6845548684
(1) Coolers

APPENDIX C

SOIL BORING LOGS

TEST BORING [illegible]

PROJECT NAME Dow Hanging Rock Plant

PROJECT NO. 7015.500

LOCATION Former Drum Storage Area

GEOLOGIST D. Martincak

DEPTH FEET	SOIL SAMPLE NO.	REC. (IN.)	BL./6"	VISUAL CLASSIFICATION AND REMARKS	PROFILE	STATIC WATER LEVEL (FT)	OVA READING	DEPTH (FEET)	REMARKS
0				HSA - Asphalt					Headspace Results (ppm)
2				HSA Cuttings - Brown SILT, Some Clay, Moist	ML				
4									
6	SS1	12	5 6 7 10	Stiff, Brown SILT and CLAY, Many Distinct Gray-Brown Mottles Moist No Odor	ML / CL				175
8	SS2	17	3 3 5 5	Soft to Medium Stiff, Brown SILT, Some Clay, Common Distinct Gray Mottles, Moist to Wet, Chemical Odor	ML				494
10	SS3	16	2 3 5 5	Soft to Medium Stiff, Brown to Brown-Gray SILT, Some Very Fine Sand, Trace Clay, Moist, Strong Chemical Odor	ML				532
12	SS4	17	10 18 18 20	Medium Dense, Brown, Fine to Coarse SAND, Some Fine Gravel, Moist, Chemical Odor	SW				Clear Contact 290
14	HSA			As Above	SW				
16									

ADDITIONAL REMARKS

Drilling Co. - Philip Environmental, Inc. Driller: Gary Suddath

- CME-75 ; 4 1/4 HSA with Split Spoon Sampling
- Drilled and Sampled on 1/11/96

TEST BORING SB-60

PROJECT NAME Dow Hanging Rock Plant PROJECT NO. 7015.500

LOCATION Former Drum Storage Area GEOLOGIST D Martincek

DEPTH FEET	SOIL SAMPLE NO.	REC. (IN.)	BL/6"	VISUAL CLASSIFICATION AND REMARKS	PROFILE	STATIC WATER LEVEL (FT)	OVA READING	DEPTH (FEET)	REMARKS
16	HSA								
17	SS5	14	7 15 14 17	Medium Dense, Brown, Medium to Coarse SAND, Some Fine Gravel, Moist, Chemical Odor	SP				78
19	HSA			As Above	SP				
22	SS6	14	6 9 11 12	Medium Dense, Light Brown, Medium to Coarse SAND, Little to Some Fine Gravel, Moist	SP				Headspace 7.3 Analytical Sample: DHR-SB60-2224
24				EOB = 24.0'					

• Boring Backfilled with Bentonite / Cement Grout

ADDITIONAL REMARKS

TEST BORING SB-01 PAGE OF

PROJECT NAME Dow Hanging Rock Plant PROJECT NO. 7015.500

LOCATION Former Drum Storage Area GEOLOGIST D. Martinez

DEPTH FEET	SOIL SAMPLE NO.	REC. (IN.)	BL/6"	VISUAL CLASSIFICATION AND REMARKS	PROFILE	STATIC WATER LEVEL (FT)	OVA READING	DEPTH (FEET)	REMARKS
				HSA - Asphalt					Headspace Result (ppm)
2 4				HSA Cuttings - Light Brown SILT and CLAY, Becoming a Silty Clay with Many Distinct Gray Mottles, Moist	ML / CL				
6	SS1	14	3 7 7 7	Medium Stiff, Light Brown CLAY, Some Silt, Many Distinct Light Gray Mottles Moist	CL				78
8	SS2	14	2 5 6 6	Medium Stiff, Brown SILT, Some Clay, Common Distinct Light Gray Mottles, Moist, Chemical Odor	ML				102
10	SS3	14	1 2 4 12	Soft, As Above, Becoming Siltier with Very Fine Sand, Moist, Slight Chemical Odor (12.0') Medium Dense Gray-Brown Fine to Coarse SAND, Some Silt, Trace Fine Gravel, Moist	ML				741 Clear Contact
12	SS4	19	14 14 16 20	Medium Dense, Brown, Medium to Coarse SAND, Some Fine Gravel Moist	SP				0.0
14 16	SS5	16	4 12 20 22	Medium Dense, Brown, Fine to Coarse SAND, Some Gravel, Trace Silt, Moist EOB = 16.0'	SW				Headspace 9.7 Analytical Sample DHR-SB61-1416

ADDITIONAL REMARKS

- Drilling Co. - Philip Environmental, Inc. Driller: Gary Suddath
- CME-75 ; 4 1/4 HSA with Split Spoon Sampling
- Drilled and Sampled on 1/11/96
- Boring Backfilled with Bentonite / Cement Grout

TEST BORING SB-62 PAGE 1 OF 1

PROJECT NAME Dow Hanging Rock Plant PROJECT NO. 7015.500

LOCATION Former Drum Storage Area GEOLOGIST D. Martincek

DEPTH FEET	SOIL SAMPLE NO.	REC. (IN.)	BL/6"	VISUAL CLASSIFICATION AND REMARKS	PROFILE	STATIC WATER LEVEL (FT)	OVA READING	DEPTH (FEET)	REMARKS
				HSA - ASPHALT					Headspace Result (ppm)
2	HSA			HSA Cuttings - Light Brown SILT, Some Clay, Little Fine Sand and Fine Gravel, Moist	ML				
4	HSA								
6	SS1	19	5 6 8 10	Medium Stiff to Stiff, Light Brown SILT and CLAY, Many Distinct Light Gray Mottles, Moist, Slight Chemical Odor	ML / CL				34
8	SS2	18	3 4 2 6	Soft, As Above Becoming Siltier with Little Very Fine Sand, Moist, Slight Chemical Odor	ML / CL				36
10	SS3	18	1 4 14 20	Soft, Light Brown SILT and CLAY, Little Very Fine Sand, Moist Clear Contact Medium Dense, Light Brown, Fine to Coarse SAND, Little Fine Gravel, Moist	ML / CL SW				0.0
12	SS4	16	3 14 17 20	Medium Dense, Light Brown, Fine to Coarse SAND, Little Fine Gravel, Moist	SW				Headspace 0.0 Analytical Sample: DHR-SB62-1214
14				EOB = 14.0'					
16									

ADDITIONAL REMARKS

Drilling Co. - Philip Environmental, Inc. Driller - Garry Suddath

- CME-75 - 4 1/4 HSA and Split Spoon Sampling
- Drilled and Sampled on 1/10/96
- Boring backfilled with Bentonite / Cement Grout

TEST BORING 18-63

PROJECT NAME Dow Hanging Rock Plant

PROJECT NO. 7015.005

LOCATION Former Drum Storage Area

GEOLOGIST D Martinez

DEPTH FEET	SOIL SAMPLE NO.	REC. (IN.)	BL/6"	VISUAL CLASSIFICATION AND REMARKS	PROFILE	STATIC WATER LEVEL (FT)	OVA READING	DEPTH (FEET)	REMARKS
				HSA - Asphalt					Headspace Result (ppm)
2	HSA			HSA Cuttings - Brown SILT, Little Clay, Trace Fine Gravel, Moist	ML				
4	HSA								
6	SS1	18	1 3 2 3	Soft, Light Brown SILT, Little Clay, Many Light Gray Mottles, Moist, Chemical Odor	ML				2559
8	SS2	17	1 2 4 4	Soft, Light Brown SILT and Very Fine SAND, Trace Clay, Moist	ML / SP				439
10	SS3	18	1 5 10 20	Soft, Light Brown SILT and Very Fine SAND, Trace Clay, Moist to Wet	ML / SP				48
				(11.0-12.0) Clear Contact, Light Brown Fine to Very Coarse SAND, Some Fine Gravel, Moist	SW				
12	SS4	16	6 14 16 16	Medium Dense, Light Brown, Medium SAND, Little Fine Gravel, Moist, Slight Chemical Odor	SP				7.3
14	SS5	19	5 13 18 19	Medium Dense, Light Brown, Medium to Coarse SAND, Little Fine Gravel, Moist, Slight Chemical Odor	SP				7.3
16									

ADDITIONAL REMARKS

Drilling Co. - Philip Environmental, Inc. Driller: Gary Suddath

- CME-75; 4 1/4 HSA and Split Spoon Sampling
- Drilled and Sampled on 1/10/96

TEST BORING SB-63

PROJECT NAME Dow Hanging Rock Plant PROJECT NO. 7015.500

LOCATION Former Drum Storage Area GEOLOGIST D Martincek

DEPTH FEET	SOIL SAMPLE NO.	REC. (IN.)	BL/6"	VISUAL CLASSIFICATION AND REMARKS	PROFILE	STATIC WATER LEVEL (FT)	OVA READING	DEPTH (FEET)	REMARKS
16	SS6	18	10 13 19 19	Medium Dense, Light Brown, Fine to Coarse SAND, Some Fine Gravel Moist, Slight Chemical Odor	SW				4.8
18	SS7	16	4 10 14 15	Medium Dense, Light Brown, Fine to Coarse SAND, Some Fine Gravel, Moist	SW				Headspace - 4.8 Analytical Sample: DHR-SB63-1820
20				EOB = 20.0'					

ADDITIONAL REMARKS - Borehole backfilled with Bentonite / Cement Grout

TEST BORING SB-52CR

PROJECT NAME Dow Hanging Rock Plant PROJECT NO. 7015.500

LOCATION Former Drum Storage Area GEOLOGIST D Martinrek

DEPTH FEET	SOIL SAMPLE NO.	REC. (IN.)	BL/6"	VISUAL CLASSIFICATION AND REMARKS	PROFILE	STATIC WATER LEVEL (FT)	OVA READING	DEPTH (FEET)	REMARKS
0	HSA			ASPHALT / CONCRETE					Headspace Results (ppm)
2				HSA Cuttings: Orange-Brown SILT and CLAY, Moist	ML / CL				
4									
6	SS1	18	3 4 5 5	Soft to Medium Stiff, Brown SILT, Some Clay, Common Distinct, Gray-Brown Mottles, Moist to Wet, Slight Chemical Odor	ML				85
8	SS2	15	2 3 4 4	Soft, Brown, SILT, Little Clay, Trace Very Fine to Fine Sand, Moist to Wet, Chemical Odor	ML				226
10	SS3	17	3 3 3 4	Soft, Brown SILT and Fine SAND, Trace Clay, Moist to Wet, Chemical Odor	ML / SP				1004
									Clear Contact
12	SS4	16	7 4 18 22	Loose to Medium Dense, Brown, Fine to Coarse SAND, Some Fine Gravel, Moist, Slight Chemical Odor	SW				7.3
14	SS5	15	7 10 14 22	Loose to Medium Dense, Brown, Medium to Coarse SAND, Some Fine Gravel, Moist, Chemical Odor	SP				0.0
16									

ADDITIONAL REMARKS

Drilling Co. - Philip Environmental, Inc. Driller: Garry Suddath

- CME-75; 4 1/4 HSA with Split Spoon Sampling
- Drilled and Sampled on 1/11/96

TEST BORING SB-53CR

PROJECT NAME Dow Hanging Rock Plant PROJECT NO. 7015.500

LOCATION Former Drum Storage Area GEOLOGIST D Martinek

DEPTH FEET	SOIL SAMPLE NO.	REC. (IN.)	BL./6"	VISUAL CLASSIFICATION AND REMARKS	PROFILE	STATIC WATER LEVEL (FT)	OVA READING	DEPTH (FEET)	REMARKS
16	SS6	10	10 17 19 16	Medium Dense, Brown, Medium to Coarse SAND, Some Fine Gravel, Moist	SP				34
18	SS7	18	10 14 18 18	Medium Dense, Light Brown, Fine to Medium SAND, Some Fine Gravel, Moist	SP				0.0
20	SS8	17	10 14 16 18	Medium Dense, Light Brown, Fine to Very Coarse SAND, Some Fine Gravel, Moist	SW				0.0
22	SS9	14	7 11 14 15	Medium Dense, Light Brown, Fine to Very Coarse SAND, Some Fine Gravel, Moist	SW				Headspace 0.0 Analytical Sample: DHR-SB53CR-22'-24'
24				EOB = 24.0'					

ADDITIONAL REMARKS

- Boring backfilled with Bentonite / Cement Grout.

APPENDIX D

DATA VALIDATION LETTER/RESULTS AS REPORTED FROM LABORATORY

Dow Environmental Inc.
Penn Center West
Building III, Suite 300
Pittsburgh, PA 15276
Fax: (412) 788-1316

(412) 788-2717

PGH-96-TMJ-138

DATE February 23, 1996

TO Dr. Amiram Roffman
Radian International LLC
Penn Center West
Pittsburgh, Pennsylvania 15276

FROM Thomas M. Jackman
Radian International LLC

SUBJECT Data Validation of:
Volatile Organic Compounds (VOCs)
Barium

RE: DOW Hanging Rock, Ohio Site

Ross Analytical Services, Inc. Work Order No.96-01-059

Sample IDs

DHR-SB63-1820	DHR-SB61-1416	DHR-SB53CR-2224
DHR-SB62-1214	DHR-SB60-2224	

Overview

This sample set for the soil borings along the process sewer line north of the Former Drum Storage Area contained 5 soil samples which were analyzed for Volatile Organic Compounds (VOCs) by U.S. EPA SW-846 Method 8240B and for barium by U.S. EPA Methods 3050A and 6010A.

Summary

All compounds were successfully analyzed in all samples. The quality of analytical data was evaluated by the following parameters: holding times, surrogate spike recoveries, laboratory control sample (LCS) results, and laboratory blanks. Areas of concern with respect to data usability are discussed below.

Data Validation Results

An examination of the analytical and quality control data in this data package indicates that quality assurance/quality control (QA/QC) criteria were met for all parameters.

Notes

The data were reviewed according to the National Functional Guidelines for Organic and Inorganic Data Review.

Information Regarding Report Content

Attachments:

1. Glossary of data qualifier codes.
2. Data Summary. This may include.
   a) All positive results with qualifier codes, if applicable.
   b) All estimated detection limits with qualifier codes, if applicable.
3. Appendix A - Results as Reported by the Laboratory

DATA SUMMARY
SOIL VOLATILE ORGANIC COMPOUND (VOC) CONCENTRATIONS FOR SAMPLES ALONG THE PROCESS SEWER LINE

	Volatile Organic Concentrations (µg/kg) at Indicated Soil Boring									
Sample ID	DHR-SB63-1820		DHR-SB62-1214		DHR-SB61-1416		DHR-SB60-2224		DHR-SB53CR-2224	
CHLOROMETHANE	10	U	10	U	10	U	10	U	10	U
BROMOMETHANE	10	U	10	U	10	U	10	U	10	U
VINYL CHLORIDE	10	U	10	U	10	U	10	U	10	U
CHLOROETHANE	10	U	10	U	10	U	10	U	10	U
METHYLENE CHLORIDE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
ACETONE	23		15		10	U	10	U	22	
CARBON DISULFIDE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1-DICHLOROETHENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1-DICHLOROETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2-DICHLOROETHENE (total)	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
CHLOROFORM	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2-DICHLOROETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-BUTANONE	10	U	10	U	10	U	10	U	10	U
1,1,1-TRICHLOROETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
CARBON TETRACHLORIDE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
VINYL ACETATE	10	U	10	U	10	U	10	U	10	U
BROMODICHLOROMETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1,2,2-TETRACHLOROETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2-DICHLOROPROPANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
trans-1,3-DICHLOROPROPENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
TRICHLOROETHENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
DIBROMOCHLOROMETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,1,2-TRICHLOROETHANE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
BENZENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
cis-1,3-TRICHLOROPROPENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-CHLOROETHYL VINYL ETHER	200	U	200	U	200	U	200	U	200	U
BROMOFORM	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-HEXANONE	10	U	10	U	10	U	10	U	10	U
4-METHYL-2-PENTANONE	10	U	10	U	10	U	10	U	10	U
TETRACHLOROETHENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
TOLUENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
CHLOROBENZENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
ETHYLBENZENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
STYRENE	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
XYLENES (total)	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U

DATA SUMMARY
CONCENTRATIONS OF BARIUM IN SOIL
FOR SAMPLES ALONG THE PROCESS SEWER LINE

	BariumConcentrations (µg/kg) at Indicated Soil Boring									
Sample ID	DHR-SB63-1820		DHR-SB62-1214		DHR-SB61-1416		DHR-SB60-2224		DHR-SB53CR-2224	
BARIUM	43.1		63		48.8		37.9		30.4	

RESULTS AS REPORTED BY THE LABORATORY

Barium by ICP **Method(s):** 6010A

Lab No.	Sample Description	Result	Units	EQL
01A	Soil DHR-SB63-1820	43.1	mg/Kg	0.40
02A	Soil DHR-SB62-1214	63	mg/Kg	0.40
03A	Soil DHR-SB61-1416	48.8	mg/Kg	0.40
04A	Soil DHR-SB60-2224	37.9	mg/Kg	0.40
05A	Soil DHR-SB53CR-2224	30.4	mg/Kg	0.40

Work Order # 96-01-059 Ross Analytical Services, Inc Reported: 01/24/96

Sample Description Soil DHR-SB63-1820 Lab No. 01
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 01/16/96 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT	EQL	CAS NO.	PARAMETER	RESULT	EQL
74-87-3	Chloromethane	<EQL	10	78-87-5	1,2-Dichloropropane	<EQL	5.0
74-83-9	Bromomethane	<EQL	10	10061-02-6	trans-1,3-Dichloropropene	<EQL	5.0
75-01-4	Vinyl chloride	<EQL	10	79-01-6	Trichloroethene	<EQL	5.0
75-00-3	Chloroethane	<EQL	10	124-48-1	Dibromochloromethane	<EQL	5.0
75-09-2	Methylene chloride	<EQL	5.0	79-00-5	1,1,2-Trichloroethane	<EQL	5.0
67-64-1	Acetone	23	10	71-43-2	Benzene	<EQL	5.0
75-15-0	Carbon disulfide	<EQL	5.0	10061-01-5	cis-1,3-Dichloropropene	<EQL	5.0
75-35-4	1,1-Dichloroethene	<EQL	5.0	110-75-8	2-Chloroethyl vinyl ether	<EQL	200
75-34-3	1,1-Dichloroethane	<EQL	5.0	75-25-2	Bromoform	<EQL	
156-60-5	1,2-Dichloroethene (total)	<EQL	5.0	591-78-6	2-Hexanone	<EQL	10
67-66-3	Chloroform	<EQL	5.0	108-10-1	4-Methyl-2-pentanone	<EQL	10
107-06-2	1,2-Dichloroethane	<EQL	5.0	127-18-4	Tetrachloroethene	<EQL	5.0
78-93-3	2-Butanone	<EQL	10	108-88-3	Toluene	<EQL	5.0
71-55-6	1,1,1-Trichloroethane	<EQL	5.0	108-90-7	Chlorobenzene	<EQL	5.0
56-23-5	Carbon tetrachloride	<EQL	5.0	100-41-4	Ethyl benzene	<EQL	5.0
108-05-4	Vinyl acetate	<EQL	10	100-42-5	Styrene	<EQL	5.0
75-27-4	Bromodichloromethane	<EQL	5.0		Xylenes	<EQL	5.0
79-34-5	1,1,2,2-Tetrachloroethane	<EQL	5.0				

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	105	70 - 121
Toluene-d8	106	81 - 117
4-Bromofluorobenzene	100	74 - 121

Work Order # 96-01-059 Ross Analytical Services, Inc Reported: 01/24/96

Sample Description Soil DHR-SB62-1214 Lab No. 02
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 01/16/96 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT	EQL	CAS NO.	PARAMETER	RESULT	EQL
74-87-3	Chloromethane	<EQL	10	78-87-5	1,2-Dichloropropane	<EQL	5.0
74-83-9	Bromomethane	<EQL	10	10061-02-6	trans-1,3-Dichloropropene	<EQL	5.0
75-01-4	Vinyl chloride	<EQL	10	79-01-6	Trichloroethene	<EQL	5.0
75-00-3	Chloroethane	<EQL	10	124-48-1	Dibromochloromethane	<EQL	5.0
75-09-2	Methylene chloride	<EQL	5.0	79-00-5	1,1,2-Trichloroethane	<EQL	5.0
67-64-1	Acetone	15	10	71-43-2	Benzene	<EQL	5.0
75-15-0	Carbon disulfide	<EQL	5.0	10061-01-5	cis-1,3-Dichloropropene	<EQL	5.0
75-35-4	1,1-Dichloroethene	<EQL	5.0	110-75-8	2-Chloroethyl vinyl ether	<EQL	200
75-34-3	1,1-Dichloroethane	<EQL	5.0	75-25-2	Bromoform	<EQL	5.0
156-60-5	1,2-Dichloroethene (total)	<EQL	5.0	591-78-6	2-Hexanone	<EQL	10
67-66-3	Chloroform	<EQL	5.0	108-10-1	4-Methyl-2-pentanone	<EQL	10
107-06-2	1,2-Dichloroethane	<EQL	5.0	127-18-4	Tetrachloroethene	<EQL	5.0
78-93-3	2-Butanone	<EQL	10	108-88-3	Toluene	<EQL	5.0
71-55-6	1,1,1-Trichloroethane	<EQL	5.0	108-90-7	Chlorobenzene	<EQL	5.0
56-23-5	Carbon tetrachloride	<EQL	5.0	100-41-4	Ethyl benzene	<EQL	5.0
108-05-4	Vinyl acetate	<EQL	10	100-42-5	Styrene	<EQL	5.0
75-27-4	Bromodichloromethane	<EQL	5.0		Xylenes	<EQL	5.0
79-34-5	1,1,2,2-Tetrachloroethane	<EQL	5.0				

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	105	70 - 121
Toluene-d8	107	81 - 117
4-Bromofluorobenzene	99	74 - 121

Work Order # 96-01-059 Ross Analytical Services, Inc Reported: 01/24/96

Sample Description Soil DHR-SB61-1416 Lab No. 03
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 01/17/96 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT	EQL	CAS NO.	PARAMETER	RESULT	EQL
74-87-3	Chloromethane	<EQL	10	78-87-5	1,2-Dichloropropane	<EQL	5.0
74-83-9	Bromomethane	<EQL	10	10061-02-6	trans-1,3-Dichloropropene	<EQL	5.0
75-01-4	Vinyl chloride	<EQL	10	79-01-6	Trichloroethene	<EQL	5.0
75-00-3	Chloroethane	<EQL	10	124-48-1	Dibromochloromethane	<EQL	5.0
75-09-2	Methylene chloride	<EQL	5.0	79-00-5	1,1,2-Trichloroethane	<EQL	5.0
67-64-1	Acetone	<EQL	10	71-43-2	Benzene	<EQL	5.0
75-15-0	Carbon disulfide	<EQL	5.0	10061-01-5	cis-1,3-Dichloropropene	<EQL	5.0
75-35-4	1,1-Dichloroethene	<EQL	5.0	110-75-8	2-Chloroethyl vinyl ether	<EQL	200
75-34-3	1,1-Dichloroethane	<EQL	5.0	75-25-2	Bromoform	<EQL	
156-60-5	1,2-Dichloroethene (total)	<EQL	5.0	591-78-6	2-Hexanone	<EQL	10
67-66-3	Chloroform	<EQL	5.0	108-10-1	4-Methyl-2-pentanone	<EQL	10
107-06-2	1,2-Dichloroethane	<EQL	5.0	127-18-4	Tetrachloroethene	<EQL	5.0
78-93-3	2-Butanone	<EQL	10	108-88-3	Toluene	<EQL	5.0
71-55-6	1,1,1-Trichloroethane	<EQL	5.0	108-90-7	Chlorobenzene	<EQL	5.0
56-23-5	Carbon tetrachloride	<EQL	5.0	100-41-4	Ethyl benzene	<EQL	5.0
108-05-4	Vinyl acetate	<EQL	10	100-42-5	Styrene	<EQL	5.0
75-27-4	Bromodichloromethane	<EQL	5.0		Xylenes	<EQL	5.0
79-34-5	1,1,2,2-Tetrachloroethane	<EQL	5.0				

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	105	70 - 121
Toluene-d8	107	81 - 117
4-Bromofluorobenzene	106	74 - 121

Work Order # 96-01-059 Ross Analytical Services, Inc Reported: 01/24/96

Sample Description Soil DHR-SB60-2224 Lab No. 04
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 01/17/96 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT	EQL	CAS NO.	PARAMETER	RESULT	EQL
74-87-3	Chloromethane	<EQL	10	78-87-5	1,2-Dichloropropane	<EQL	5.0
74-83-9	Bromomethane	<EQL	10	10061-02-6	trans-1,3-Dichloropropene	<EQL	5.0
75-01-4	Vinyl chloride	<EQL	10	79-01-6	Trichloroethene	<EQL	5.0
75-00-3	Chloroethane	<EQL	10	124-48-1	Dibromochloromethane	<EQL	5.0
75-09-2	Methylene chloride	<EQL	5.0	79-00-5	1,1,2-Trichloroethane	<EQL	5.0
67-64-1	Acetone	<EQL	10	71-43-2	Benzene	<EQL	5.0
75-15-0	Carbon disulfide	<EQL	5.0	10061-01-5	cis-1,3-Dichloropropene	<EQL	5.0
75-35-4	1,1-Dichloroethene	<EQL	5.0	110-75-8	2-Chloroethyl vinyl ether	<EQL	200
75-34-3	1,1-Dichloroethane	<EQL	5.0	75-25-2	Bromoform	<EQL	5.0
156-60-5	1,2-Dichloroethene (total)	<EQL	5.0	591-78-6	2-Hexanone	<EQL	10
67-66-3	Chloroform	<EQL	5.0	108-10-1	4-Methyl-2-pentanone	<EQL	10
107-06-2	1,2-Dichloroethane	<EQL	5.0	127-18-4	Tetrachloroethene	<EQL	5.0
78-93-3	2-Butanone	<EQL	10	108-88-3	Toluene	<EQL	5.0
71-55-6	1,1,1-Trichloroethane	<EQL	5.0	108-90-7	Chlorobenzene	<EQL	5.0
56-23-5	Carbon tetrachloride	<EQL	5.0	100-41-4	Ethyl benzene	<EQL	5.0
108-05-4	Vinyl acetate	<EQL	10	100-42-5	Styrene	<EQL	5.0
75-27-4	Bromodichloromethane	<EQL	5.0		Xylenes	<EQL	5.0
79-34-5	1,1,2,2-Tetrachloroethane	<EQL	5.0				

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	105	70 - 121
Toluene-d8	103	81 - 117
4-Bromofluorobenzene	103	74 - 121

Work Order # 96-01-059 Ross Analytical Services, Inc Reported: 01/24/96

Sample Description Soil DHR-SB53CR-2224 Lab No. 05
Test Description Volatiles by GC/MS Test Code 8240

DATE ANALYZED 01/17/96 DILUTION FACTOR 1 UNITS ug/Kg

CAS NO.	COMPOUND	RESULT	EQL	CAS NO.	PARAMETER	RESULT	EQL
74-87-3	Chloromethane	<EQL	10	78-87-5	1,2-Dichloropropane	<EQL	5.0
74-83-9	Bromomethane	<EQL	10	10061-02-6	trans-1,3-Dichloropropene	<EQL	5.0
75-01-4	Vinyl chloride	<EQL	10	79-01-6	Trichloroethene	<EQL	5.0
75-00-3	Chloroethane	<EQL	10	124-48-1	Dibromochloromethane	<EQL	5.0
75-09-2	Methylene chloride	<EQL	5.0	79-00-5	1,1,2-Trichloroethane	<EQL	5.0
67-64-1	Acetone	22	10	71-43-2	Benzene	<EQL	5.0
75-15-0	Carbon disulfide	<EQL	5.0	10061-01-5	cis-1,3-Dichloropropene	<EQL	5.0
75-35-4	1,1-Dichloroethene	<EQL	5.0	110-75-8	2-Chloroethyl vinyl ether	<EQL	200
75-34-3	1,1-Dichloroethane	<EQL	5.0	75-25-2	Bromoform	<EQL	[illegible]
156-60-5	1,2-Dichloroethene (total)	<EQL	5.0	591-78-6	2-Hexanone	<EQL	10
67-66-3	Chloroform	<EQL	5.0	108-10-1	4-Methyl-2-pentanone	<EQL	10
107-06-2	1,2-Dichloroethane	<EQL	5.0	127-18-4	Tetrachloroethene	<EQL	5.0
78-93-3	2-Butanone	<EQL	10	108-88-3	Toluene	<EQL	5.0
71-55-6	1,1,1-Trichloroethane	<EQL	5.0	108-90-7	Chlorobenzene	<EQL	5.0
56-23-5	Carbon tetrachloride	<EQL	5.0	100-41-4	Ethyl benzene	<EQL	5.0
108-05-4	Vinyl acetate	<EQL	10	100-42-5	Styrene	<EQL	5.0
75-27-4	Bromodichloromethane	<EQL	5.0		Xylenes	<EQL	5.0
79-34-5	1,1,2,2-Tetrachloroethane	<EQL	5.0				

SURROGATE	% RECOVERY	LIMITS
1,2-Dichloroethane-d4	103	70 - 121
Toluene-d8	107	81 - 117
4-Bromofluorobenzene	97	74 - 121

RADIAN INTERNATIONAL LLC

APPENDIX E

METHODOLOGY FOR CALCULATING THE RISK-BASED SOIL CLEAN-UP LEVELS

METHODOLOGY FOR DEVELOPING CLEANUP LEVELS

Risk-based soil cleanup levels for the closure of the Former Drum Storage Area at the DOW Chemical Hanging Rock Plant were developed using Ohio EPA Closure Plan Review Guidance for RCRA Facilities, Interim Final, September 1, 1993 and U.S. EPA Risk Assessment for Superfund, Part B (RAGS-B), December, 1991.

Soil cleanup levels were developed for industrial and residential (child and adult) land use by accounting for the cumulative effect of soil ingestion, dermal contact with soils, inhalation of vapors emitted from soil and inhalation of particulates for carcinogenic and noncarcinogenic effects. The following describes the methodology of the cleanup level calculations.

Ingestion and Dermal Contact

The equations and default factors used to evaluate carcinogenic and noncarcinogenic effects for residential and industrial exposures were obtained from Ohio EPA Closure Plan Review Guidance for RCRA Facilities. The equations and exposure factors for these scenarios are included in Attachment B. As specified by the Ohio EPA, oral Reference Doses (RfDo) and oral carcinogenic slope factors (CSFo) were adjusted when evaluating risks from dermal contact. The adjustment factors are as follows:

Methylene Chloride - 0.80
Acrylonitrile - 0.95
Ethylbenzene - 0.82
Styrene - 0.90

The result of this adjustment is that risks from dermal contact were increased (and cleanup levels lowered) by these factors relative to the oral RfDos and CSFos.

Inhalation Exposures

For inhalation scenarios, the exposure factors employed in the risk assessment equations were those supplied in Ohio EPA Closure Plan Review Guidance for RCRA Facilities. However, it was necessary to account for the chemical concentration in air term (CA) by using the guidance in RAGS-B, pages 27 and 28 (see Attachment C). This approach makes use of Volatilization Factors (VFs) and Particulate Emission Factors (PEFs) as means of estimating the amount of vapor or particulates in a given volume of air. For this assessment, the PEF value was the default value supplied in RAGS-B, 4.63×10^9 m^3/kg. VFs were calculated for each constituent (see Attachment D) . The values of all variables used to calculate the VFs were those specified in RAGS-B with the exception of the area of contamination. The site-specific area of contamination is 5,000,000 cm^2. Chemical specific variables such as the diffusion coefficient in air, Henry's Law Constant and Koc were obtained from the literature.

1.0 INTRODUCTION

Risk-based soil cleanup levels for the closure of the Former Drum Storage Area at the DOW Chemical Hanging Rock Plant were developed using U.S. Environmental Protection Agency (EPA human health risk assessment methodology.

Soil clean-up levels were developed for residential land use as follows:

Residential Land Use

Soil cleanup levels were developed by using the methodology outlined in the U.S. EPA's Risk Assessment Guidance for Superfund: Volume I - Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals) (RAGS-B). This methodology assumes that residents could be exposed to constituents in soil via the ingestion pathway only.

The constituents included in the development of soil clean-up levels are acrylonitrile (AN), methylene chloride (MC), ethylbenzene (EB) and styrene (ST). The calculations considered both carcinogenic (AN and MC) and noncarcinogenic (EB and ST) effects.

2.0 RESIDENTIAL SOIL CLEAN-UP LEVELS

The U.S. EPA RAGS-B formulas for residential clean-up levels for carcinogenic and noncarcinogenic effects are (see attachment A which includes excerpts from RAGS-B):

$$\text{RSCL (carcinogens)} = \frac{TR \times AT \times 365\ \text{days/year}}{SFo \times 10^{-6}\ \text{kg/mg} \times EF \times IF}$$

$$\text{RSCL (noncarcinogens)} = \frac{THI \times AT \times 365\ \text{days/year}}{(1/RfDo \times 10^{-6}\ \text{kg/mg} \times EF \times IF}$$

where:

RSCL	=	Residential soil cleanup levels (carcinogenic and noncarcinogenic effects), mg/kg
TR	=	Target excess lifetime cancer risk, 10^{-6}, unitless
SFo	=	Oral Cancer Slope Factor, $(mg/kg/day)^{-1}$
	=	0.54 $(mg/kg/day)^{-1}$ for acrylonitrile
	=	0.0075 $(mg/kg/day)^{-1}$ for methylene chloride
AT	=	Averaging time, 70 years for carcinogens
EF	=	Exposure Frequency, 350 days/year
IF	=	Age-adjusted ingestion factor, 114 mg-year/kg-day
THI	=	Target Hazard Index, 1, unitless

RfDo	=	Oral Chronic Reference Dose, mg/kg/day
	=	0.1 mg/kg/day for ethylbenzene
	=	0.2 mg/kg/day for styrene
AT	=	Averaging time, 30 years for noncarcinogens

Substituting these parameters in the respective formulas yields:

RSCL (carcinogenic effects) = 0.64/SFo mg/kg
RSCL (noncarcinogenic effects) = $2.744 \times 10^5 \times$ RfDo mg/kg

Table E.1 lists the calculated carcinogenic and noncarcinogenic soil clean-up levels based on the methodology outlined above. The data show that the clean-up level for acrylonitrile is the most restrictive.

The residential soil clean-up levels for EB and ST (noncarcinogens) shown in Table E.1 are based on the U.S. EPA RAGS-B methodology. The U.S. EPA Soil Screening Guidance (December, 1994, see Attachment B) soil clean-up levels are also included in Table E.1 for comparison. As noted, the clean-up levels for non-carcinogenic constituents are about 29 percent of the corresponding RAGS B clean-up levels. This difference is attributed to the conservatism built into the U.S. EPA methodology for soil screening clean-up levels, which utilizes child exposure parameters instead of the age-adjusted soil ingestion factor by the RAGS B methodology, and which is based on both child and adult exposure parameters. The soil screening methodology utilizes a child body weight of 15 kg, average time of 6 years, exposure duration of 6 years, and soil ingestion rate of 200 mg/d (see Attachment B). The RAGS B methodology calculates the age-adjusted soil ingestion factor using the exposure duration divided by body weight for a child and an adult as a weighting factor for the corresponding soil ingestion rates. The clean-up levels selected for the Hanging Rock Site are of the lowest of the two values, i.e., 7,800 mg/kg for EB and 16,000 for ST.

ATTACHMENTS

ATTACHMENT A -	**RISK BASED SOIL CLEANUP LEVELS FORMER DRUM STORAGE AREA DOW HANGING ROCK PLANT**
ATTACHMENT B -	**EXCERPTS FROM OHIO EPA CLOSURE PLAN REVIEW GUIDANCE FOR RCRA FACILITIES**
ATTACHMENT C -	**EXCERPTS FROM U.S. EPA RISK ASSESSMENT GUIDANCE FOR SUPERFUND - PART B (RAGS-B)**
ATTACHMENT D -	**CALCULATION OF VOLATILIZATION FACTORS (VFS)**

ATTACHMENT A

RISK BASED SOIL CLEANUP LEVELS

FORMER DRUM STORAGE AREA
DOW HANGING ROCK PLANT

RISK-BASED SOIL CLEANUP LEVELS
FORMER DRUM STORAGE AREA
DOW - HANGING ROCK PLANT

Constituent	Industrial Cleanup Level (mg/kg)	Residential Cleanup Level (mg/kg)
Acrylonitrile	2.5	1.0
Ethylbenzene	400*	400*
Methylene Chloride	50	20
Styrene	1,200*	450

* Soil Saturation Levels. As per U.S. EPA Soil Screening guidelines, (EPA /540/R-95/128, May 1996), soil saturation concentrations are used when risk-based cleanup levels are greater than the published soil saturation levels.

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - COMMERCIAL/INDUSTRIAL EXPOSURE
CARCINOGENIC AND NONCARCINOGENIC HEALTH EFFECTS FROM INGESTION OF SOILS

	SOIL CONC.	INGESTION RATE	CONVERSION FACTOR	FRACTION INGESTED	EXPOSURE FREQUENCY	EXPOSURE DURATION	BODY WEIGHT	AVERAGING TIME (NC)	AVERAGING TIME (CA)	NONCARC. DOSE	CANCER DOSE	REFERENCE DOSE (RfD)	CARC. SLOPE FACTOR (CSF)	HAZARD QUOTIENT	CANCER RISK
	(mg/kg)	(mg/soil/day)	(kg/mg)	(1=100%)	(events/yr)	(yr)	(kg)	(days)	(days)	(mg/kg/day)	(mg/kg/day)	(mg/kg/day)	(mg/kg/day)-1		
Methylene Chloride	50	50	1E-06	1.0	250	25	70	9,125	25,550	2.4E-05	8.7E-06	6.0E-02	7.5E-03	4.08E-04	6.55E-08
Acrylonitrile	2.5	50	1E-06	1.0	250	25	70	9,125	25,550	1.2E-06	4.4E-07	1.0E-03	5.4E-01	1.22E-03	2.36E-07
Ethylbenzene	400	50	1E-06	1.0	250	25	70	9,125	25,550	2.0E-04	7.0E-05	1.0E-01		1.96E-03	
Styrene	1200	50	1E-06	1.0	250	25	70	9,125	25,550	5.9E-04	2.1E-04	2.0E-01		2.94E-03	
														6.52E-03	3.01E-07

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - FUTURE POTENTIAL RESIDENTIAL EXPOSURE
CARCINOGENIC AND NONCARCINOGENIC HEALTH EFFECTS FROM DERMAL CONTACT WITH SOILS - CHILD EXPOSURE

	CS	CF	SA	AF	ABS	EF	ED	BW	AT	AT			Dermal	Oral		
	SOIL CONC.	CONVERSION FACTOR	SKIN SURFACE AREA	SKIN ADHERENCE FACTOR	ABSORPTION FACTOR	EXPOSURE FREQUENCY	EXPOSURE DURATION	BODY WEIGHT	AVERAGING TIME (NC)	AVERAGING TIME (CA)	NONCARC. DOSE	CANCER DOSE	REFERENCE DOSE (RfD)	CARC. SLOPE FACTOR (CSF)	HAZARD QUOTIENT	CANCER RISK
	(mg/kg)		(cm^2/event)	(mg/cm^2)	(1=100%)	(events/yr)	(yr)	(kg)	(days)	(days)	(mg/kg/day)	(mg/kg/day)	(mg/kg/day)	(mg/kg/day)-1		
Methylene Chloride	20	1E-06	2,000	1.0	0.25	350	6	15	2,190	25,550	6.4E-04	5.48E-05	6.0E-02	7.5E-03	1.33E-02	5.14E-07
Acrylonitrile	1	1E-06	2,000	1.0	0.25	350	6	15	2,190	25,550	3.2E-05	2.74E-06	1.0E-03	5.4E-01	3.36E-02	1.56E-06
Ethylbenzene	400	1E-06	2,000	1.0	0.25	350	6	15	2,190	25,550	1.3E-02	1.10E-03	1.0E-01		1.56E-01	
Styrene	450	1E-06	2,000	1.0	0.25	350	6	15	2,190	25,550	1.4E-02	1.23E-03	2.0E-01		7.99E-02	
															2.83E-01	**2.07E-06**

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - FUTURE POTENTIAL RESIDENTIAL EXPOSURE
CARCINOGENIC AND NONCARCINOGENIC HEALTH EFFECTS FROM DERMAL CONTACT WITH SOILS - ADULT EXPOSURE

	CS	CF	SA	AF	ABS	EF	ED	BW	AT	AT			Dermal	Oral		
	SOIL CONC.	CONVERSION FACTOR	SKIN SURFACE AREA	SKIN ADHERENCE FACTOR	ABSORPTION FACTOR	EXPOSURE FREQUENCY	EXPOSURE DURATION	BODY WEIGHT	AVERAGING TIME (NC)	AVERAGING TIME (CA)	NONCARC. DOSE	CANCER DOSE	REFERENCE DOSE (RfD)	CARC. SLOPE FACTOR (CSF)	HAZARD QUOTIENT	CANCER RISK
	(mg/kg)		(cm^2/event)	(mg/cm^2)	(1=100%)	(events/yr)	(yr)	(kg)	(days)	(days)	(mg/kg/day)	(mg/kg/day)	(mg/kg/day)	(mg/kg/day)-1		
Methylene Chloride	20	1E-06	5,000	1.0	0.25	350	30	70	10,950	25,550	3.4E-04	1.47E-04	6.0E-02	7.5E-03	7.13E-03	1.38E-06
Acrylonitrile	1	1E-06	5,000	1.0	0.25	350	30	70	10,950	25,550	1.7E-05	7.34E-06	1.0E-03	5.4E-01	1.80E-02	4.17E-06
Ethylbenzene	400	1E-06	5,000	1.0	0.25	350	30	70	10,950	25,550	6.8E-03	2.94E-03	1.0E-01		8.35E-02	
Styrene	450	1E-06	5,000	1.0	0.25	350	30	70	10,950	25,550	7.7E-03	3.30E-03	2.0E-01		4.28E-02	
															1.51E-01	**5.55E-06**

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - COMMERCIAL/INDUSTRIAL EXPOSURE
CARCINOGENIC AND NONCARCINOGENIC HEALTH EFFECTS FROM DERMAL CONTACT WITH SOILS

	CS SOIL CONC. (mg/kg)	CF CONVERSION FACTOR	SA SKIN SURFACE AREA (cm^2/event)	AF SKIN ADHERENCE FACTOR (mg/cm^2)	ABS ABSORPTION FACTOR (1=100%)	EF EXPOSURE FREQUENCY (events/yr)	ED EXPOSURE DURATION (yr)	BW BODY WEIGHT (kg)	AT AVERAGING TIME (NC) (days)	AT AVERAGING TIME (CA) (days)	NONCARC. DOSE (mg/kg/day)	CANCER DOSE (mg/kg/day)	Dermal REFERENCE DOSE (RfD) (mg/kg/day)	Oral CARC. SLOPE FACTOR (CSF) (mg/kg/day)-1	HAZARD QUOTIENT	CANCER RISK
Methylene Chloride	50	1E-06	5,000	1.0	0.25	250	25	70	9,125	25,550	6.1E-04	2.18E-04	6.0E-02	7.5E-03	1.27E-02	2.05E-06
Acrylonitrile	2.5	1E-06	5,000	1.0	0.25	250	25	70	9,125	25,550	3.1E-05	1.09E-05	1.0E-03	5.4E-01	3.22E-02	6.21E-06
Ethylbenzene	400	1E-06	5,000	1.0	0.25	250	25	70	9,125	25,550	4.9E-03	1.75E-03	1.0E-01		5.97E-02	
Styrene	1200	1E-06	5,000	1.0	0.25	250	25	70	9,125	25,550	1.5E-02	5.24E-03	2.0E-01		8.15E-02	
															1.86E-01	**8.26E-06**

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - FUTURE POTENTIAL RESIDENTIAL EXPOSURE
NONCARCINOGENIC HEALTH EFFECTS FROM INHALATION - CHILD EXPOSURE

	SOIL CONC.	INHALATION RATE	VF	PEF	EXPOSURE TIME	EXPOSURE FREQUENCY	EXPOSURE DURATION	BODY WEIGHT	AVERAGING TIME (NC)	NONCARC. DOSE	REFERENCE DOSE (RfD)	HAZARD QUOTIENT
	(mg/kg)	(cu.m/hour)	(cu.m/kg)	(cu.m/kg)	(hours/day)	(days/yr)	(yr)	(kg)	(days)	(mg/kg/day)	(mg/kg/day)	
Methylene Chloride	20	0.83	3.35E+03	4.63E+09	24	350	6	15	2,190	7.6E-03	8.60E-01	8.87E-03
Acrylonitrile	1	0.83	1.72E+04	4.63E+09	24	350	6	15	2,190	7.4E-05	5.70E-04	1.31E-01
Ethylbenzene	400	0.83	1.11E+04	4.63E+09	24	350	6	15	2,190	4.6E-02	2.86E-01	1.61E-01
Styrene	450	0.83	2.27E+04	4.63E+09	24	350	6	15	2,190	2.5E-02	2.86E-01	8.86E-02
												3.89E-01

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - FUTURE POTENTIAL RESIDENTIAL EXPOSURE
NONCARCINOGENIC HEALTH EFFECTS FROM INHALATION - ADULT EXPOSURE

	SOIL CONC.	INHALATIDN RATE	VF	PEF	EXPOSURE TIME	EXPOSURE FREQUENCY	EXPOSURE DURATION	BODY WEIGHT	AVERAGING TIME (NC)	NONCARC. DOSE	REFERENCE DOSE (RfD)	HAZARD QUOTIENT
	(mg/kg)	(cu.m/hour)	(cu.m/kg)	(cu.m/kg)	(hours/day)	(days/yr)	(yr)	(kg)	(days)	(mg/kg/day)	(mg/kg/day)	
Methylene Chloride	20	0.83	3.35E+03	4.63E+09	24	350	30	70	10,950	1.6E-03	8.60E-01	1.90E-03
Acrylonitrile	1	0.83	1.72E+04	4.63E+09	24	350	30	70	10,950	1.6E-05	5.70E-04	2.80E-02
Ethylbenzene	400	0.83	1.11E+04	4.63E+09	24	350	30	70	10,950	9.9E-03	2.86E-01	3.45E-02
Styrene	450	0.83	2.27E+04	4.63E+09	24	350	30	70	10,950	5.4E-03	2.86E-01	1.90E-02
												8.33E-02

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - COMMERCIAL/INDUSTRIAL EXPOSURE
NONCARCINOGENIC HEALTH EFFECTS FROM INHALATION

	SOIL CONC.	INHALATION RATE	VF	PEF	EXPOSURE TIME	EXPOSURE FREQUENCY	EXPOSURE DURATION	BODY WEIGHT	AVERAGING TIME (NC)	NONCARC. DOSE	REFERENCE DOSE (RfD)	HAZARD QUOTIENT
	(mg/kg)	(cu.m/hour)	(cu.m/kg)	(cu.m/kg)	(hours/day)	(days/yr)	(yr)	(kg)	(days)	(mg/kg/day)	(mg/kg/day)	
Methylene Chloride	50	0.83	3.35E+03	4.63E+09	8	250	25	70	9,125	9.7E-04	8.60E-01	1.13E-03
Acrylonitrile	2.5	0.83	1.72E+04	4.63E+09	8	250	25	70	9,125	9.5E-06	5.70E-04	1.66E-02
Ethylbenzene	400	0.83	1.11E+04	4.63E+09	8	250	25	70	9,125	2.3E-03	2.86E-01	8.21E-03
Styrene	1200	0.83	2.27E+04	4.63E+09	8	250	25	70	9,125	3.4E-03	2.86E-01	1.20E-02
												3.80E-02

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - FUTURE POTENTIAL RESIDENTIAL EXPOSURE
CARCINOGENIC HEALTH EFFECTS FROM INHALATION - CHILD EXPOSURE

	SOIL CONC.	INHALATION RATE	VF	PEF	EXPOSURE TIME	EXPOSURE FREQUENCY	EXPOSURE DURATION	BODY WEIGHT	AVERAGING TIME (CA)	CANCER DOSE	INHALATION CSF	CANCER RISK
	(mg/kg)	(cu.m/hour)	(cu.m/kg)	(cu.m/kg)	(hours/day)	(days/yr)	(yr)	(kg)	(days)	(mg/kg/day)	(mg/kg/day)-1	
Methylene Chloride	20	0.83	3.35E+03	4.63E+09	24	350	6	15	25,550	6.5E-04	1.60E-03	1.05E-06
Acrylonitrile	1	0.83	1.72E+04	4.63E+09	24	350	6	15	25,550	6.4E-06	2.40E-01	1.53E-06
												2.58E-06

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - FUTURE POTENTIAL RESIDENTIAL EXPOSURE
CARCINOGENIC HEALTH EFFECTS FROM INHALATION - ADULT EXPOSURE

	SOIL CONC.	INHALATION RATE	VF	PEF	EXPOSURE TIME	EXPOSURE FREQUENCY	EXPOSURE DURATION	BODY WEIGHT	AVERAGING TIME (CA)	CANCER DOSE	INHALATION CSF	CANCER RISK
	(mg/kg)	(cu.m/hour)	(cu.m/kg)	(cu.m/kg)	(hours/day)	(days/yr)	(yr)	(kg)	(days)	(mg/kg/day)	(mg/kg/day)-1	
Methylene Chloride	20	0.83	3.35E+03	4.63E+09	24	350	30	70	25,550	7.0E-04	1.60E-03	1.12E-06
Acrylonitrile	1	0.83	1.72E+04	4.63E+09	24	350	30	70	25,550	6.8E-06	2.40E-01	1.64E-06
												2.76E-06

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - COMMERCIAL/INDUSTRIAL EXPOSURE
CARCINOGENIC HEALTH EFFECTS FROM INHALATION

	SOIL CONC.	INHALATION RATE	VF	PEF	EXPOSURE TIME	EXPOSURE FREQUENCY	EXPOSURE DURATION	BODY WEIGHT	AVERAGING TIME (CA)	CANCER DOSE	INHALATION CSF	CANCER RISK
	(mg/kg)	(cu.m/hour)	(cu.m/kg)	(cu.m/kg)	(hours/day)	(days/yr)	(yr)	(kg)	(days)	(mg/kg/day)	(mg/kg/day)-1	
Methylene Chloride	50	0.83	3.35E+03	4.63E+09	8	250	25	70	25,550	3.5E-04	1.60E-03	5.56E-07
Acrylonitrile	2.5	0.83	1.72E+04	4.63E+09	8	250	25	70	25,550	3.4E-06	2.40E-01	8.13E-07
												1.37E-06

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - FUTURE POTENTIAL RESIDENTIAL EXPOSURE
CARCINOGENIC AND NONCARCINOGENIC HEALTH EFFECTS FROM INGESTION OF SOILS - CHILD EXPOSURE

	SOIL CONC.	INGESTION RATE	CONVERSION FACTOR	FRACTION INGESTED	EXPOSURE FREQUENCY	EXPOSURE DURATION	BODY WEIGHT	AVERAGING TIME (NC)	AVERAGING TIME (CA)	NONCARC. DOSE	CANCER DOSE	REFERENCE DOSE (RfD)	CARC. SLOPE FACTOR (CSF)	HAZARD QUOTIENT	CANCER RISK
	(mg/kg)	(mg/soil/day)	(kg/mg)	(1=100%)	(events/yr)	(yr)	(kg)	(days)	(days)	(mg/kg/day)	(mg/kg/day)	(mg/kg/day)	(mg/kg/day)-1		
Methylene Chloride	20	200	1E-06	1.0	350	6	15	2,190	25,550	2.6E-04	2.2E-05	6.0E-02	7.5E-03	4.26E-03	1.64E-07
Acrylonitrile	1	200	1E-06	1.0	350	6	15	2,190	25,550	1.3E-05	1.1E-06	1.0E-03	5.4E-01	1.28E-02	5.92E-07
Ethylbenzene	400	200	1E-06	1.0	350	6	15	2,190	25,550	5.1E-03	4.4E-04	1.0E-01		5.11E-02	
Styrene	450	200	1E-06	1.0	350	6	15	2,190	25,550	5.8E-03	4.9E-04	2.0E-01		2.88E-02	
														9.70E-02	**7.56E-07**

DOW HANGING ROCK PLANT, FORMER DRUM STORAGE AREA - FUTURE POTENTIAL RESIDENTIAL EXPOSURE
CARCINOGENIC AND NONCARCINOGENIC HEALTH EFFECTS FROM INGESTION OF SOILS - ADULT EXPOSURE

	SOIL CONC.	INGESTION RATE	CONVERSION FACTOR	FRACTION INGESTED	EXPOSURE FREQUENCY	EXPOSURE DURATION	BODY WEIGHT	AVERAGING TIME (NC)	AVERAGING TIME (CA)	NONCARC. DOSE	CANCER DOSE	REFERENCE DOSE (RfD)	CARC. SLOPE FACTOR (CSF)	HAZARD QUOTIENT	CANCER RISK
	(mg/kg)	(mg/soil/day)	(kg/mg)	(1=100%)	(events/yr)	(yr)	(kg)	(days)	(days)	(mg/kg/day)	(mg/kg/day)	(mg/kg/day)	(mg/kg/day)-1		
Methylene Chloride	20	100	1E-06	1.0	350	30	70	10,950	25,550	2.7E-05	1.2E-05	6.0E-02	7.5E-03	4.57E-04	8.81E-08
Acrylonitrile	1	100	1E-06	1.0	350	30	70	10,950	25,550	1.4E-06	5.9E-07	1.0E-03	5.4E-01	1.37E-03	3.17E-07
Ethylbenzene	400	100	1E-06	1.0	350	30	70	10,950	25,550	5.5E-04	2.3E-04	1.0E-01		5.48E-03	
Styrene	450	100	1E-06	1.0	350	30	70	10,950	25,550	6.2E-04	2.6E-04	2.0E-01		3.08E-03	
														1.04E-02	**4.05E-07**

ATTACHMENT B

EXCERPTS FROM OHIO EPA CLOSURE PLAN REVIEW GUIDANCE FOR RCRA FACILITIES

CLOSURE PLAN REVIEW GUIDANCE

for RCRA FACILITIES

INTERIM FINAL

Interim Final

September 1, 1993

00001

INTERIM FINAL

GUIDANCE FOR REVIEWING RISK-BASED CLOSURE PLANS FOR RCRA UNITS

OHIO ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF HAZARDOUS WASTE MANAGEMENT (DHWM)
1800 Watermark Drive, P.O. Box 1049
Columbus Ohio 43266-0149

September 1, 1993
Interim Final

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INTERIM FINAL

APPENDIX E

Dose Equations and Standard Default Parameters

INTERIM FINAL

Table 1

RESIDENTIAL EXPOSURE: INGESTION OF CHEMICALS IN SOILS AND DUST

$$Intake\ (mg/kg\text{-}d) = \frac{CS \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$$

Exposure Parameters		Value	Comments
CS:	Chemical Concentration in Soil site-specific (mg/kg)	95% UCL	1
IR:	Ingestion Rate (mg/d)		2
	child	200	
	adult	100	
CF:	Conversion Factor (kg/mg)	1×10^{-6}	
FI:	Fraction Ingested (unitless)	1	3
EF:	Exposure Frequency (days/yr)	350	4
ED:	Exposure Duration (yrs)		5
	child	6	
	adult	30	
BW:	Body Weight (kg)		6
	child	15	
	adult	70	
AT:	Averaging Time (days)		7
	child noncarcinogens	2,190	
	adult noncarcinogens	10,950	
	child carcinogens	25,550	
	adult carcinogens	25,550	

INTERIM FINAL

Table 2

RESIDENTIAL EXPOSURE: DERMAL CONTACT WITH CHEMICALS IN SOIL

$$\text{Absorbed dose (mg/kg-d)} = \frac{CS \times CF\ SA \times AF \times ABS \times EF \times ED^{*}}{BW \times AT}$$

Exposure Parameters		Value	Comments
CS:	Chemical Concentration in Soil site-specific (mg/kg)	95% UCL	1
CF:	Conversion Factor (kg/mg)	1×10^{-6}	
SA:	Skin Surface Area (cm^2/day)		8
	child	2,000	
	adult	5,000	
AF:	Adherence Factor (unitless)	1.0	9
ABS:	Absorption Factor (unitless)		10
EF:	Exposure Frequency (days/yr)	350	4
ED:	Exposure Duration (yrs)		5
	child	6	
	adult	30	
BW:	Body Weight (kg)		6
	child	15	
	adult	70	
AT:	Averaging Time (days)		7
	child noncarcinogens	2,190	
	adult noncarcinogens	10,950	
	child carcinogens	25,550	
	adult carcinogens	25,550	

* Refer to Comment 11

INTERIM FINAL

Table 5

RESIDENTIAL EXPOSURE: INHALATION OF AIRBORNE CHEMICALS

$$Intake\ (mg/kg\text{-}d) = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT}$$

Exposure Parameters		Value	Comments
CA:	Chemical Concentration in Air site-specific (mg/m^3)	modelled	1
IR:	Inhalation Rate		14
	child/adult, outdoor (m^3/hr)	0.83	
	showering	0.6	
ET:	Exposure Time (hrs/day)		15
	child/adult, outdoor	24	
	showering	0.2	
EF:	Exposure Frequency (days/yr)	350	4
ED:	Exposure Duration (yrs)		5
	child	6	
	adult	30	
BW:	Body Weight (kg)		6
	child	15	
	adult	70	
AT:	Averaging Time (days)		7
	child noncarcinogens	2,190	
	adult noncarcinogens	10,950	
	child carcinogens	25,550	
	adult carcinogens	25,550	

INTERIM FINAL

Table 6

INDUSTRIAL EXPOSURE: INGESTION OF CHEMICALS IN SOILS AND DUST

$$Intake\ (mg/kg\text{-}d) = \frac{CS \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$$

Exposure Parameters		Value	Comments
CS:	Chemical Concentration in Soil site-specific (mg/kg)	95% UCL	1
IR:	Ingestion Rate (mg/d)	50	2
CF:	Conversion Factor (kg/mg)	1×10^{-6}	
FI:	Fraction Ingested (unitless)	1	3
EF:	Exposure Frequency (days/yr)	250	4
ED:	Exposure Duration (yrs)	25	5
BW:	Body Weight (kg)	70	6
AT:	Averaging Time (days)		7
	adult noncarcinogens	9,125	
	adult carcinogens	25,550	

INTERIM FINAL

Table 7

INDUSTRIAL EXPOSURE: DERMAL CONTACT WITH CHEMICALS IN SOIL

$$\text{Absorbed dose (mg/kg-d)} = \frac{CS \times CF\ SA \times AF \times ABS \times EF \times ED^{*}}{BW \times AT}$$

Exposure Parameters		Value	Comments
CS:	Chemical Concentration in Soil site-specific (mg/kg)	95% UCL	1
CF:	Conversion Factor (kg/mg)	1×10^{-6}	
SA:	Skin Surface Area (cm^2/day)	5,000	8
AF:	Adherence Factor (unitless)	1.0	9
ABS:	Absorption Factor (unitless)		10
EF:	Exposure Frequency (days/yr)	250	4
ED:	Exposure Duration (yrs)	25	5
BW:	Body Weight (kg)	70	6
AT:	Averaging Time (days)		7
	adult noncarcinogens	9,125	
	adult carcinogens	25,550	

* Refer to Comment 11

INTERIM FINAL

Table 10

INDUSTRIAL EXPOSURE: INHALATION OF AIRBORNE CHEMICALS

$$Intake\ (mg/kg\text{-}d) = \frac{CA \times IR \times ET \times EF \times ED}{BW \times AT}$$

Exposure Parameters		Value	Comments
CA:	Chemical Concentration in Air site-specific (mg/m^3)	modelled	1
IR:	Inhalation Rate		14
	adult, outdoor (m^3/hr)	0.83	
	showering	0.6	
ET:	Exposure Time (hrs/day)		15
	adult, outdoor	8	
	showering	0.2	
EF:	Exposure Frequency (days/yr)	250	4
ED:	Exposure Duration (yrs)	25	
BW:	Body Weight (kg)	70	6
AT:	Averaging Time (days)		7
	adult noncarcinogens	9,125	
	adult carcinogens	25,550	

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Comments for Tables 1 through 5

1. Site-specific values should be used from the contaminated site. The 95% UCL shall be used to quantify the exposure from soil, air, and water. In some cases, on-site air concentrations may have to be calculated using dispersion models. Refer to Section 3.2.4.

2. The ingestion rate suggested for children, ages 1 through 6 (6 years of exposure), are based primarily on fecal tracer studies which account for ingestion of indoor dust as well as outdoor soil. These values should be viewed as long-term average daily ingestion rates for children and should be used in conjunction with an exposure frequency of 365 days per year as per RAGS, Part A (USEPA, 1989). Subsequently, the March 21, 1991 *Standard Default Exposure Factors* updated the exposure frequency to 350 days per year.

3. Note that household dust, which contributes significantly to daily soil ingestion may have contaminant concentrations equal to 100% (RAGS, Part A; USEPA, 1989) of outdoor soil. In these cases, indoor dust is assumed to be equal to outdoor soil, fraction of soil or dust ingested from the site is equal to 1.0.

4. Human behavior patterns can strongly affect exposure results. Based on the limitations of our knowledge, the values for the exposure duration and frequency for the pathways considered are intended to be best reasonable upper-bound estimates. For example, the vapor inhalation scenario assumes that a person will be breathing at a rate of 20 m^3 por day for 24 hours per day for a peried of 30 years. It also assumes that the concentration indoors will be the same as the same as the concentration outdoors. These assumptions are considered reasenable since it is possible to observe certain subpopulations (i.e., housewives spending the majority of their time at their residence).

5. Refer to RAGS, Part A (USEPA, 1989a) for a more detailed discussion.

6. Body weight for adults and children ar assumed to be average values of males and females (RAGS, Part A; USEPA, 1989a).

7. Refer to RAGS, Part A (USEPA, 1989a) for a more detailed discussion.

8. For dermal contact with soil and dust, twenty five percent of the total skin area may be exposed to soil. Thus, applying 25% of the total surface area results in defaults of 2,000 cm^2 and for children and 5,000 cm^2 for adults. When calculating exposure while showering, bathing or

swimming in contaminated water the average values of total body surface area is assumed to be exposed. Refer to *Dermal Exposure Assessment: Principles and Applications* (USEPA, 1992a).

9. Adherence factor are assumed to be 1.0 mg/cm^2 unless site-specific information shows that this rate is inaccurate.

10. For the purposes of dermal exposure to contaminated soil, absorption factors of 25% for volatile organic chemicals (VOCs), 10% for semivolatile organic compounds (SVOCs), and 1% for inorganic compounds (Ryan et al., 1987). These default values should be modified when chemical-specific information is available.

11. In assessing dermal contact risks, it is necessary to convert oral SFs oral RfDs from administered doses to absorbed doses since the exposure assessment is expressed as an absorbed dose. Chemical-specific information regarding oral absorption should be used if possible. Appendix G contains oral absorption factors which should be used as follows: (1) use human absorption factors before animal absorption factors; (2) use the most conservative absorption factor (e.g., highest percentage); and (3) use animal absorption factors when human absorption factors are unavailable. When oral factors are not listed in Appendix G, search the open literature.

12. The value of liters per day is based mostly on tradition. Use of the traditional values is necessitated by the fact that many EPA risk assessment "standards" were based on those intakes. it is also comparable to the eight glasses of water per day histerically recommended by health authorities, and USEPA uses 2 liters per day when calculating drinking water standards.

13. Chemical-specific values for permeability constants should be sought in referred journals and other suitable technical publications. When pursuing values found in the literature, always include a complete citation. Refer to *Dermal Exposure Assessment: Principles and Applications* (USEPA, 1992a).

14. Currently, inhalation SFs and RfCs are derived by USEPA using the traditional inhalation rate of 20 m^3 per day, thus this value should be used for both adults and children.

15. This pathway assumes that the individual is exposed to contaminants in the air from outdoor soil, household dust, and suspended particulate matter inside and outside the house. Thus, residents who are assumed to live on the contaminated site may come into contact daily with contaminated soil outdoors or with contaminated dust inside

their house. Even during the rainy season or winter season where low temperatures, snow, and frozen or saturated ground limit outdoor play and consequent exposure to soil, indoor exposure is assumed to occur during this period. Therefore, household dust can contribute significantly to daily soil ingestion and may have contaminant concentrations equal to 100% (RAGS, Part A; USEPA, 1989a) of outdoor soil. Therefore, it is assumed exposure occurs 24 hours per day even though "outdoor" time is only a fraction of the day, and indoor contaminant concentrations are in equilibrium with those outdoors.

ATTACHMENT C

EXCERPTS FROM U.S. EPA RISK ASSESSMENT GUIDANCE FOR SUPERFUND - PART B (RAGS-B)

Publication 9285.7-01B
December 1991

PB92-963333

Risk Assessment Guidance for Superfund: Volume I — Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals)

Interim

Office of Emergency and Remedial Response
U.S. Environmental Protection Agency
Washington, DC 20460

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
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SPRINGFIELD, VA 22161

COMMERCIAL/INDUSTRIAL SOIL — CARCINOGENIC EFFECTS

$$TR = \frac{SF_o \times C \times 10^{-6}\ kg/mg \times EF \times ED \times IR_{soil}}{BW \times AT \times 365\ days/yr} + \frac{SF_i \times C \times EF \times ED \times IR_{air} \times (1/VF + 1/PEF)}{BW \times AT \times 365\ days/yr}$$

$$C\ (mg/kg;\ risk\text{-}based) = \frac{TR \times BW \times AT \times 365\ days/yr}{EF \times ED \times [(SF_o \times 10^{-6}\ kg/mg \times IR_{soil}) + (SF_i \times IR_{air} \times [1/VF + 1/PEF])]} \quad (6)$$

where:

Parameters	Definition (units)	Default Value
C	chemical concentration in soil (mg/kg)	—
TR	target excess individual lifetime cancer risk (unitless)	10^{-6}
SF_i	inhalation cancer slope factor ($(mg/kg\text{-}day)^{-1}$)	chemical-specific
SF_o	oral cancer slope factor ($(mg/kg\text{-}day)^{-1}$)	chemical-specific
BW	adult body weight (kg)	70 kg
AT	averaging time (yr)	70 yr
EF	exposure frequency (days/yr)	250 days/yr
ED	exposure duration (yr)	25 yr
IR_{soil}	soil ingestion rate (mg/day)	50 mg/day
IR_{air}	workday inhalation rate (m^3/day)	20 m^3/day
VF	soil-to-air volatilization factor (m^3/kg)	chemical-specific (see Section 3.3.1)
PEF	particulate emission factor(m^3/kg)	4.63×10^9 m^3/kg (see Section 3.3.2)

$$C_{sat} = (K_d \times s \times n_w) + (s \times \Theta_w) \quad (6a)$$

where:

Parameters	Definition (units)	Default Value
C_{sat}	soil saturation concentration (mg/kg)	—
K_d	soil-water partition coefficient (L/kg)	chemical-specific, or K_{oc} x OC
K_{oc}	organic carbon partition coefficient (L/kg)	chemical-specific
OC	organic carbon content of soil (fraction)	site-specific, or 0.02
s	solubility (mg/L-water)	chemical-specific
n_w	soil moisture content, expressed as a weight fraction	site-specific
Θ_w	soil moisture content, expressed as L-water/kg-soil	site-specific

REDUCED EQUATION: COMMERCIAL/INDUSTRIAL SOIL — CARCINOGENIC EFFECTS

$$\text{Risk-based PRG}\ (mg/kg;\ TR = 10^{-6}) = \frac{2.9 \times 10^{-4}}{[((5 \times 10^{-5}) \times SF_o) + (SF_i \times ((20/VF) + (4.3 \times 10^{-6})))]} \quad (6')$$

where:

SF_o = oral slope factor in $(mg/kg\text{-}day)^{-1}$
SF_i = inhalation slope factor in $(mg/kg\text{-}day)^{-1}$
VF = chemical-specific soil-to-air volatilization factor in m^3/kg (see Section 3.3.1)

If PRG > C_{sat}, then set PRG = C_{sat} (where C_{sat} = soil saturation concentration (mg/kg); see Equation (6a) and Section 3.3.1).

COMMERCIAL/INDUSTRIAL SOIL — NONCARCINOGENIC EFFECTS

$$THI = \frac{C \times 10^{-6}\ kg/mg \times EF \times ED \times IR_{soil}}{RfD_o \times BW \times AT \times 365\ days/yr} + \frac{C \times EF \times ED \times IR_{air} \times (1/VF + 1/PEF)}{RfD_i \times BW \times AT \times 365\ days/yr}$$

$$C\ (mg/kg;\ risk\text{-}based) = \frac{THI \times BW \times AT \times 365\ days/yr}{ED \times EF \times [((1/RfD_o) \times 10^{-6}\ kg/mg \times IR_{soil}) + ((1/RfD_i) \times IR_{air} \times (1/VF + 1/PEF))]} \quad (7)$$

where:

Parameters	Definition (units)	Default Value
C	chemical concentration in soil (mg/kg)	—
THI	target hazard index (unitless)	1
RfD_o	oral chronic reference dose (mg/kg-day)	chemical-specific
RfD_i	inhalation chronic reference dose (mg/kg-day)	chemical-specific
BW	adult body weight (kg)	70 kg
AT	averaging time (yr)	25 yr (always equal to ED)
EF	exposure frequency (days/yr)	250 days/yr
ED	exposure duration (yr)	25 yr
IR_{soil}	soil ingestion rate (mg/day)	50 mg/day
IR_{air}	workday inhalation rate (m^3/day)	20 m^3/day
VF	soil-to-air volatilization factor (m^3/kg)	chemical-specific (see Section 3.3.1)
PEF	particulate emission factor (m^3/kg)	4.63×10^9 m^3/kg (see Section 3.3.2)

$$C_{sat} = (K_d \times s \times n_m) + (s \times \Theta_m) \quad (7a)$$

where:

Parameters	Definition (units)	Default Value
C_{sat}	soil saturation concentration (mg/kg)	—
K_d	soil-water partition coefficient (L/kg)	chemical-specific, or K_{oc} x OC
K_{oc}	organic carbon partition coefficient (L/kg)	chemical-specific
OC	organic carbon content of soil (fraction)	site-specific, or 0.02
s	solubility (mg/L-water)	chemical-specific
n_m	soil moisture content, expressed as a weight fraction	site-specific
Θ_m	soil moisture content, expressed as L-water/kg-soil	site-specific

REDUCED EQUATION: COMMERCIAL/INDUSTRIAL SOIL — NONCARCINOGENIC EFFECTS

$$\text{Risk-based PRG (mg/kg; THI = 1)} = \frac{102}{[(5 \times 10^{-5}/RfD_o) + ((1/RfD_i) \times ((20/VF) + (4.3 \times 10^{-6})))]} \quad (7')$$

where:

RfD_o = oral chronic reference dose in mg/kg-day
RfD_i = inhalation chronic reference dose in mg/kg-day
VF = chemical-specific soil-to-air volatilization factor in m^3/kg (see Section 3.3.1)

If PRG > C_{sat}, then set PRG = C_{sat} (where C_{sat} = soil saturation concentration (mg/kg); see Equation (7a) and Section 3.3.1).

A chemical-specific value for VF is used in the standard default equations (Equations (6), (6'), (7), and (7') in Section 3.2.2) and is developed in Equation (8). The VF value calculated using Equation (8) has been developed for specific use in the other equations in this guidance; it may not be applicable in other technical contexts. Equation (8) lists the standard default parameters for calculating VF. If site-specific information is available, Equation (8) may be modified to calculate a VF that is more appropriate for the particular site. Supporting references should be consulted when substituting site-specific data to ensure that the model and specific parameters can be appropriately applied to the given site.

3.3.2 PARTICULATE EMISSION FACTOR

The particulate emission factor (PEF) relates the contaminant concentration in soil with the concentration of respirable particles (PM_{10}) in the air due to fugitive dust emissions from surface contamination sites. This relationship is derived by Cowherd (1985) for a rapid assessment procedure applicable to a typical hazardous waste site where the surface contamination provides a relatively continuous and constant potential for emission over an extended period of time (e.g., years). The particulate emissions from contaminated sites are due to wind erosion and, therefore, depend on the erodibility of the surface

SOIL-TO-AIR VOLATILIZATION FACTOR

$$VF\ (m^3/kg) = \frac{(LS \times V \times DH)}{A} \times \frac{(3.14 \times \alpha \times T)^{1/2}}{(2 \times D_{ei} \times E \times K_{sa} \times 10^{-3}\ kg/g)} \qquad (8)$$

where:

$$\alpha\ (cm^2/s) = \frac{(D_{ei} \times E)}{E + (\rho_s)(1-E)/K_{sa}}$$

Standard default parameter values that can be used to reduce Equation (8) are listed below. These represent "typical" values as identified in a number of sources. For example, when site-specific values are not available, the length of a side of the contaminated area (LS) is assumed to be 45 m; this is based on a contaminated area of 0.5 acre which approximates the size of an average residential lot. The "typical" values LS, DH, and V are from EPA 1986. "Typical" values for E, OC, and ρ_s are from EPA 1984, EPA 1988b, and EPA 1988f. Site-specific data should be substituted for the default values listed below wherever possible. Standard values for chemical-specific D_i, H, and K_{oc} can be obtained by calling the Superfund Health Risk Technical Support Center.

Parameter	Definition (units)	Default
VF	volatilization factor (m^3/kg)	—
LS	length of side of contaminated area (m)	45 m
V	wind speed in mixing zone (m/s)	2.25 m/s
DH	diffusion height (m)	2 m
A	area of contamination (cm^2)	20,250,000 cm^2
D_{ei}	effective diffusivity (cm^2/s)	$D_i \times E^{4.33}$
E	true soil porosity (unitless)	0.35
K_{sa}	soil/air partition coefficient (g soil/cm^3 air)	$(H/K_d) \times 41$, where 41 is a units conversion factor
ρ_s	true soil density or particulate density (g/cm^3)	2.65 g/cm^3
T	exposure interval (s)	7.9×10^8 s
D_i	molecular diffusivity (cm^2/s)	chemical-specific
H	Henry's law constant (atm-m^3/mol)	chemical-specific
K_d	soil-water partition coefficient (cm^3/g)	chemical-specific, or $K_{oc} \times OC$
K_{oc}	organic carbon partition coefficient (cm^3/g)	chemical-specific
OC	organic carbon content of soil (fraction)	site-specific, or 0.02

ATTACHMENT D

CALCULATION OF VOLATILIZATION FACTORS (VFS)

Calculation of Volatilization Factor (VF)
Risk Assessment Guidance for Superfund, Volume 1, Part B
Former Drum Storage Area, Dow Hanging Rock Plant

	LS (length of side - meter)	V (wind speed m/sec)	DH (diffusion height -m)	Area (sq.cm.)	pi (3.1416)
Methylene Chloride	22.4	2.25	2	5,000,000	3.1416
Ethylbenzene	22.4	2.25	2	5,000,000	3.1416
Sytrene	22.4	2.25	2	5,000,000	3.1416
Acrylonitrile	22.4	2.25	2	5,000,000	3.1416

Di (diffusivity in air - sq.c	Koc (mL/g)	OC (organic carbon fraction in soil)	Kd (mL/g) Kd = Koc x OC	E (soil porosity)	Dei (effective diffusivity - sq.cm/sec) Dei = Di x E^(0.33) (sq. cm/sec)
0.101	8.80	0.02	0.18	0.35	0.0714
0.075	220.00	0.02	4.40	0.35	0.0530
0.071	360.00	0.02	7.20	0.35	0.0502
0.11	10.00	0.02	0.20	0.35	0.0778

P (soil density - g/cu. cm)	H (Henry - atm-cu.m./mole)	Kas (g soil/cu. cm air) Kas = (H/Kd) x 41 (g/cu. cm)	T (exposure Interval - sec)	alpha (sq. cm/sec) alpha = (Dei x E)/E' + P(1-E)/Kas
2.65	2.03E-03	4.73E-01	7.88E+08	6.26E-03
2.65	6.43E-03	5.99E-02	7.88E+08	6.38E-04
2.65	2.81E-03	1.60E-02	7.88E+08	1.63E-04
2.65	8.80E-05	1.80E-02	7.88E+08	2.84E-04

C.F. (kg/g)	VF (cu. m/kg) Calc.1 x Calc. 4
0.001	3.35E+03
0.001	1.14E+04
0.001	2.27E+04
0.001	1.72E+04

APPENDIX F

EXAMPLE OF FORMS
TO BE USED DURING CLOSURE ACTIVITIES

FORM 1

DAILY FIELD LOG

Date: ____ / ____ / ____	Arrive Onsite: _____	Depart Site: _____

Weather Conditions

Morning: _____

Afternoon: _____

AWD Field Personnel Present: _____

Other Personnel: _____

Time	Activities Performed	Comments

Signature: _____

FORM 2

OFFSITE WASTE SHIPMENT LOG

Page _____ of _____

Date	Bill of Lading No.	Destination	Estimated Quantity (Tons)	Actual Quantity (Tons)	Number of Drums (If Any)	By

FORM 3

HEADSPACE ANALYSIS SAMPLE LOG

Date: _____ Project Name/Number: _____

Operator: _____ Location: _____

Background Concentration: _____

Sample Number	Locations Composited	Estimated Headspace Concentration (ppm)

Notes:

FORM 4

SAMPLING LOG

Date: _____ Project Name/Number: _____

Operator: _____ Location: _____

Sample Number	Location(s)	Indicate Purpose for Sample	
		Clean Confirmation	Land Disposal Restrictions

Notes:

RADIAN INTERNATIONAL LLC

Form 5

CHAIN-OF-CUSTODY RECORD

PROJECT NO.:	PROJECT NAME:
SAMPLERS (PRINT):	SAMPLERS (SIGNATURE):

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE TYPE	SAMPLE LOCATION	NO. OF CON-TAINERS							REMARKS

RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE / TIME	RECEIVED FOR LABORATORY BY (SIGNATURE):	REMARKS:		