GROUNDWATER TECHNOLOGY

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SUPPLEMENTAL INVESTIGATION (PHASE II) REPORT

OSMOSE WOOD PRESERVING, INC.
BUFFALO, NEW YORK
NYS DEC SPILL #915143

August 31, 1993

Submitted to:

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C:wp51/5307Phs2.893

TABLE OF CONTENTS

		Page
1.0	**Introduction**	1
1.1	Background	1
1.2	Objectives	3
1.3	Health and Safety Planning	4
1.4	Quality Assurance Project Planning	5
2.0	**Field Investigation Procedures**	**6**
2.1	Soil Boring/Monitoring Well Installation	6
2.2	Subsurface Soil Sampling	11
2.3	Monitoring Well Development	13
2.4	Groundwater Elevation Survey	13
2.5	Groundwater Sample Collection	13
2.6	Surface Soil Sampling	14
2.7	Municipal Sewer System Sample Collection	17
2.8	Decontamination	17
2.9	Sample Management and Quality Control	17
2.10	Data Validation	18
3.0	**Field Investigation Results**	19
3.1	Geologic Evaluation	19
3.1.1	Regional Geology	19
3.1.2	Site Geology	19
3.2	Subsurface Soil Sampling Results	24
3.2.1	Volatile Compounds	24
3.2.2	Semi-volatile Compounds	28
3.3	Hydrogeologic Evaluation	34
3.3.1	Regional Hydrogeology	34
3.3.2	Site Hydrogeology	34
3.4	LNAPL and DNAPL Gauging Results	35
3.5	Shallow Groundwater Sampling Results	39
3.5.1	Volatile Compounds	39
3.5.2	Semi-volatile Compounds	40
3.5.3	Turbidity, Conductivity, Temperature, pH	40
3.6	Deep Groundwater Sampling Results	46
3.6.1	Volatile Compounds	46
3.6.2	Semi-volatile Compounds	49
3.6.3	Conductivity, Temperature, pH	52
3.7	Surface Soil Sampling Results	53
3.8	Municipal Sewer System Sampling Results	57
3.9	QA/QC Sampling Results	59
3.10	Data Validation Results	59

TABLE OF CONTENTS (Continued)

4.0 Summary Discussion 60

4.1 Mass Balances 60
4.2 Delineation of LNAPL 61
4.3 Soils Above 473 ppm PAHs 62
4.4 Soils Above 10 ppm VOCs 62
4.5 Shallow Groundwater Quality 62
4.6 Deep Groundwater Gradient 68
4.7 Deep Groundwater Quality 68
4.8 Topology of Bedrock 68
4.9 Delineation of DNAPL 68
4.10 PAHs in Surface Soils 69
4.11 Municipal Sewer Impacts 69

5.0 Interim Remedial Measures 70

5.1 Interim Remedial Recommendations 70
5.1.1 On Site Soils 70
5.1.2 Liquid Phase Hydrocarbons 70
5.1.3 On and Off Site Groundwater 70
5.2 Remedial Pilot Testing 71

TABLES

2-1 Monitoring Well Screened Intervals 8
2-2 Summary of Soil Sampling Locations 12
2-3 QA/QC Sampling Summary 18
3-1 VOCs in Subsurface Soils ..... 25 - 26
3-2 PAHs in Subsurface Soils ..... 29 - 32
3-3 VOCs in Shallow Groundwater 41
3-4 PAHs in Shallow Groundwater 43
3-5 Shallow Groundwater Field Measurements 45
3-6 VOCs in Deep Groundwater 47
3-7 PAHs in Deep Groundwater 50
3-8 Deep Groundwater Field Measurements 52
3-9 Surface Soil Sampling Results 54
3-10 Distribution of PAHs in Surface Soils 55
3-11 Municipal Sewer Sampling Results 58
4-1 NYS DEC Class GA Groundwater Guidance Values and Standards 67

FIGURES

1 Site Location Map 2
2 Site Map 7
3 Surface Soil Grab Sample Locations 16
4a Geologic Cross Section A - A' 20
4b Geologic Cross Section B - B' 21
5 Bedrock Surface Contour Map 23
6 VOCs in Subsurface Soils 27

FIGURES (Continued)

7	Shallow Groundwater Contour Map	36
8	Deep Groundwater Contour Map	37
9	Areal Extent of LNAPL	38
10	Dissolved Volatiles Distribution Map (Shallow Wells)	42
11	Dissolved PAHs Distribution Map (Shallow Wells)	44
12	Dissolved Volatiles Distribution Map (Deep Wells)	48
13	Dissolved PAHs Distribution Map (Deep Wells)	51
14	Surface Soil Grab Sample Results	56
15	Areal Extent of Soils Above 473 ppm PAHs	63
16	Soils Above 473 ppm PAHs - Cross Section A - A'	64
17	Soils Above 473 ppm PAHs - Cross Section B - B'	65

APPENDICES

A	Letter Correspondences
B	Vapor Monitoring Logs
C	Well Logs
D	Groundwater Gauging and Field Measurements
E	Data Validation Report
F	Laboratory Analytical Reports
G	PAH Profiles
H	NAPL Profiles
I	Surface Sample PAH Profiles
J	Hydrocarbons Mass Estimate
K	References

1.0 INTRODUCTION

1.1 Background

Osmose Wood Preserving, Inc. (Osmose) operates a facility which manufactures a variety of preservatives used in the treatment of wood and lumber products. The facility is located at 980 Ellicott Street, Buffalo, New York (Figure 1, Site Location Map). During removal of three underground storage tanks (USTs) in August, 1989 evidence of a release to the subsurface, believed to be #2 fuel oil and brushing grade creosote, was discovered.

In June, 1990, Osmose was notified by the New York State Department of Environmental Conservation (NYSDEC) of their inclusion in the New York State Registry of Inactive Hazardous Waste Disposal Sites, and assigned NYSDEC Site Number 915143. The site was classified as "2a". Osmose contracted Groundwater Technology, Inc. (Groundwater Technology) to prepare a work plan to investigate the extent of contamination at the Ellicott Street facility. The work plan, titled Subsurface Investigation Work Plan for Osmose Wood Preserving, Inc., Buffalo, New York, June, 1990 (Work Plan) was submitted to, reviewed and accepted by the NYSDEC.

The work tasks, as described in the Work Plan, were completed and a Subsurface Investigation Report dated June 28, 1991, was submitted to the NYSDEC for review. The report included several recommendations for additional assessment work to fill data gaps which were identified during the initial (preliminary) assessment. Several additional areas of investigation, in addition to Groundwater Technology's recommendations, were identified during review of the Report by the NYSDEC. Correspondences between the NYSDEC and Groundwater Technology regarding these additional requirements are included in Appendix A. Based upon correspondence between Groundwater Technology, the NYSDEC, and Osmose, the requirements for additional assessment were finalized. These requirements were presented in the Supplemental Investigation Work Plan dated March 9, 1992.

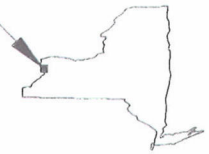
The results of the Supplemental Investigation were presented in the Supplemental Investigation Report, dated July 28, 1992, which was submitted to the NYSDEC for review. Subsequent correspondence between Groundwater Technology, the NYSDEC, and Osmose resulted in the development of the Supplemental Investigation (Phase II) Work Plan, dated October 8, 1992, to address the remaining data requirements for the site.

FIGURE 1

SITE LOCATION MAP

SOURCE: N.Y.S.D.O.T. TOPOGRAPHIC QUADRANGLE
BUFFALO NE QUADRANGLE
7.5 MINUTE SERIES
DATE: 1989

QUAD LOCATION



SCALE 1:24,000

0 2,000 4,000

SCALE FEET

N

GROUNDWATER TECHNOLOGY

1245 KINGS ROAD
SCHENECTADY, NY 12303
(518) 370-5631

DESIGNED: JOG

DETAILED: DEO

CHECKED:

SITE LOCATION MAP

CLIENT: OSMOSE WOOD PRESERVING

LOCATION: 980 ELLICOTT STREET
BUFFALO, NEW YORK

DRAWING DATE: 8/13/93

FIGURE: 1

1.2 Objectives

The objective of this report is to present the findings of the Supplemental Investigation (Phase II) Work Plan. The objective of the Phase II Investigation was to fill data gaps which previously prevented full characterization of the Osmose site. In addition to the tasks outlined in the Phase II Work Plan, comments and work steps from the following correspondences were incorporated into the scope of work:

- November 9, 1992 letter correspondence from the NYSDEC to Groundwater Technology;
- November 16, 1992 letter correspondence from Groundwater Technology to the NYSDEC;
- December 3, 1992 letter correspondence from the NYSDEC to Groundwater Technology;
- January 29, 1993 letter correspondence from Groundwater Technology to the NYSDEC;
- February 8, 1993 letter correspondence from the NYSDEC to Groundwater Technology.

Photocopies of these documents are included in Appendix A for reference.

Procedures and results are presented for soil boring/monitoring well installation, subsurface soil sampling, well development, groundwater sampling, surface soil sampling, municipal sewer sampling, decontamination procedures, sample analysis, and data validation. In addition, conclusions and recommendations are presented.

Specific objectives of the Phase II Investigation were:

1) Delineation of the extent of light non-aqueous phase liquids (LNAPL) in the following areas:
    - Downgradient of the former tank pit (in the entrance gate area and along the east side of the Osmose facility),
    - Along the sewer encasement which runs beneath Ellicott Street, and
    - Along the southern edge of the Osmose building west of monitoring well MW-3;
2) Quantification of adsorbed hydrocarbons in soils in the following locations:
    - Along the southern edge of the Osmose building west of monitoring well MW-3,
    - Along the southern Osmose property boundary,
    - In the entrance gate area and along the east side of the Osmose facility, and
    - Near the intersection of Ellicott and Edna Streets;

3) Investigation of shallow groundwater quality in the following locations:

   - Along the southern edge of the Osmose building west of monitoring well MW-3,
   - Along the southern Osmose property boundary,
   - In the entrance gate area and along the east side of the Osmose facility, and
   - Near the intersection of Ellicott and Edna Streets;

4) Investigation of deep groundwater quality along the western and southern boundaries of the site;

5) Verification of the direction of deep groundwater flow beneath the Osmose facility;

6) Determination of the topography of the bedrock surface beneath the Osmose facility;

7) Determination of the presence or absence of dense non-aqueous phase liquids (DNAPL), or dissolved constituents, at the top of bedrock along the western and southern boundaries of the site;

8) Determination of polynuclear aromatic hydrocarbon (PAH) concentrations in surface soils on the adjoining properties to the south and west of the Osmose facility to further define the source of the PAHs identified in surface soils collected during the Supplemental Investigation; and

9) Determination of the impact, if any, from PAH compounds released on site on the municipal sewer line which runs beneath Ellicott Street.

Presented in the following sections are details of the tasks performed to accomplish these objectives and the results of those tasks. Phase II field investigation procedures are presented in Section 2.0, and the results of the investigation are included in Section 3.0. Section 4.0 contains a discussion of the results, followed by conclusions in Section 5.0.

1.3 Health and Safety Planning

A site and task specific Health and Safety Plan (HSP) was prepared by Groundwater Technology in accordance with Occupational Safety and Health Administration (OSHA) standard "Hazardous Waste Operations and Emergency Response" guidelines (29 CFR 1910.120). The HSP was designed to minimize exposure of Groundwater Technology employees and subcontractors to potentially hazardous substances. In addition, the HSP provides a contingency plan in the event such exposure should occur. A copy of the NYSDEC approved HSP has been previously provided.

Ambient air monitoring was performed by the Groundwater Technology Site Safety Officer during all site activities and community air monitoring during all soil disturbance activities as detailed in the HSP. Air monitoring included screening for VOCs and airborne particulates.

A photoionization detector (PID) fitted with a 10.2 eV lamp was used to monitor VOCs. Vapor Monitoring Logs, including sampling date, time, locations, and weather conditions are included in Appendix B. During soil boring/monitor well installation, non-detectable levels of VOCs were typically encountered; however, several readings ranging from 0.1 - 10 ppmv were detected in the breathing zone near the borehole during drilling activities. All levels detected were below the Threshold Limit Value (TLV) and Permissible Exposure Limit (PEL). No work stoppages occurred due to vapor emissions.

Also included in Appendix B are the airborne particulates sampling logs. A particulate meter was set at 150 $\mu g/m^3$ above background as prescribed in the HSP. Downwind particulate levels did not exceed this threshold during soil disturbance activities.

All site work was performed in modified Level D protective equipment.

1.4 Quality Assurance Project Plan

The sample management and quality control sampling performed during the implementation of this work scope followed the site Quality Assurance Project Plan previously developed. Field QA/QC sampling was specified in the Phase II Work Plan and in the January 29, 1993 letter correspondence to the NYSDEC. As conducted previously, and as specified in Phase II Work Plan, the laboratory's data package deliverables conformed to a Project-Specific Blue Level package. The Blue Level package reports the results of the method blank, surrogate recoveries, matrix spike recoveries, and data precision, as well as a QA non-conformance summary.

2.0 FIELD INVESTIGATION PROCEDURES

2.1 Soil Boring/Monitoring Well Installation

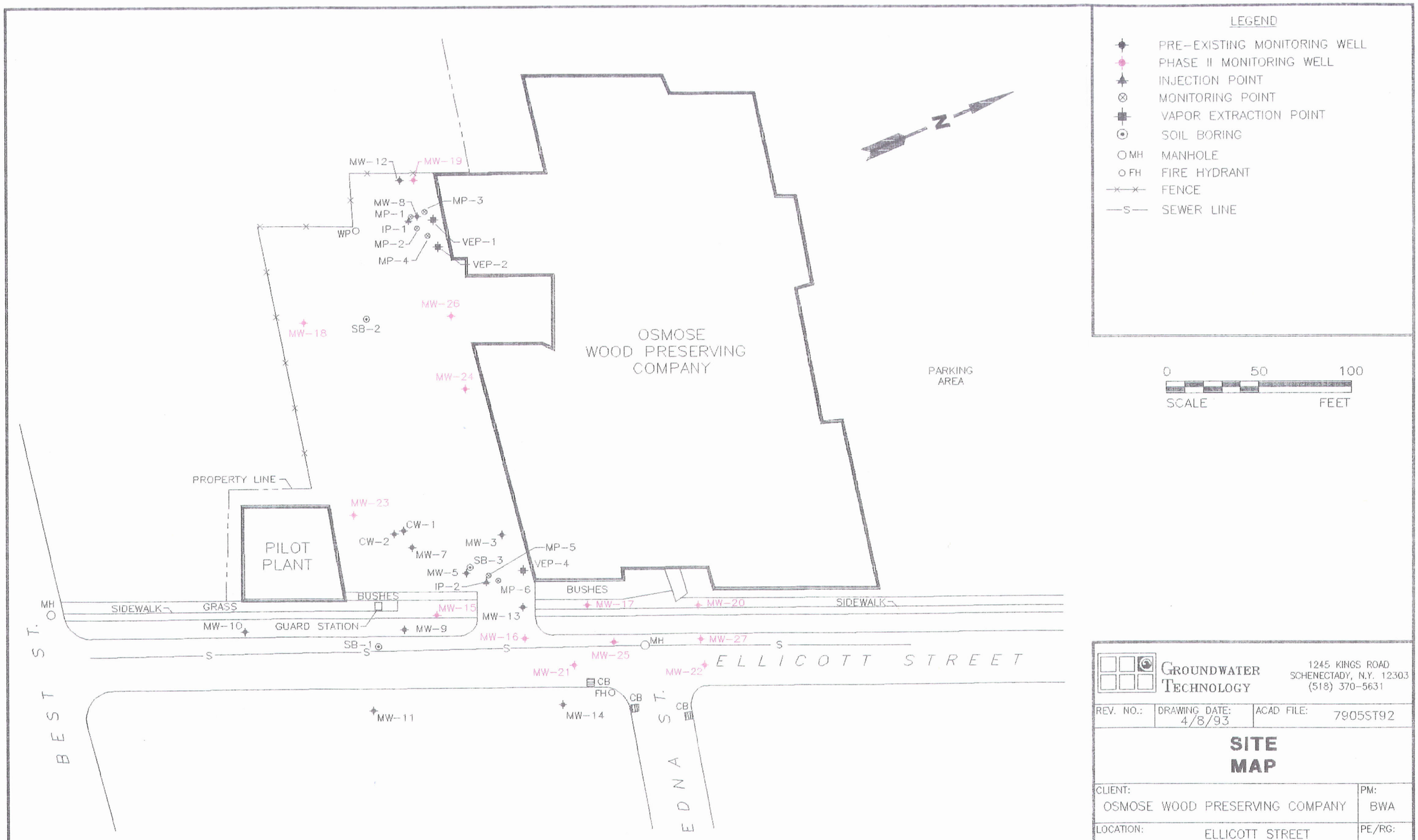
Earth Dimensions, Inc. was retained by Osmose to perform the soil borings and monitoring well installation. Due to inconsistencies in the field screening data, a decision to split the drilling into two events was made. This would allow for laboratory results from soil samples to be used when locating additional wells. The first drilling occurred in November/December, 1992, and the second in February, 1993. The second drilling event was conducted after a review of the laboratory data collected during the first event. A total of 13 soil borings were required to achieve the objectives of the Phase II Investigation. The locations of all soil borings were selected after consultation with the NYSDEC.

A hollow-stem auger drilling rig was used to complete 13 soil borings on site (Figure 2, Site Map). Previous soil boring data indicated that a clay horizon was present at 3 to 8 feet below grade near the water/air interface, underlain with silts and sands (Supplemental Investigation Report: Figure 4, Geologic Cross Sections). Bedrock had previously been encountered at a depth of 63 feet below grade at cluster well CW-1.

Continuous split-spoon soil samples were collected at each of the 11 shallow boring locations. Split-spoon samples were collected at standard five-foot intervals from 26 feet to depth at deep monitoring well MW-18 (due to running sands), and from 0 to 22 feet at deep monitoring well MW-19 (due to existing data for that interval from nearby monitoring well MW-8). Lithologic descriptions at each location were documented on soil logs by the field geologist. All soil samples were screened in the field with a photoionization detector (PID). All soil borings were completed as two-inch fiberglass-reinforced epoxy (FRE) monitoring wells. Monitoring well construction details are included on the well logs in Appendix C; the screened interval for each new well, along with previously installed monitoring wells, is shown below in Table 2-1.

Figure 2

Site Map



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REV. NO.:	DRAWING DATE:	ACAD FILE:
	4/8/93	7905ST92

SITE MAP

CLIENT:	PM:
OSMOSE WOOD PRESERVING COMPANY	BWA
LOCATION: ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	TRS/DEO	01110-7905	2

TABLE 2-1
Monitoring Well Screened Intervals

Well ID	Screened Interval (feet below grade)	Construction Material
CW-1	57 - 62	FRE
CW-2	1.5 - 5.5	FRE
MW-3	3 - 18	PVC
MW-5	3 - 18	PVC
MW-7	3 - 18	PVC
MW-8	16 - 21	FRE
MW-9	8 - 28	FRE
MW-10	11 - 25	FRE
MW-11	9 - 16	FRE
MW-12	10 - 20	FRE
MW-13	4 - 14	FRE
MW-14	57 - 62	FRE
MW-15	5.5 - 15.5	FRE
MW-16	5.5 - 15.5	FRE
MW-17	5 - 15	FRE
MW-18	53 - 58	FRE
MW-19	49 - 54	FRE
MW-20	5.5 - 15.5	FRE
MW-21	5.5 - 15.5	FRE
MW-22	3.5 - 15	FRE
MW-23	3.5 - 15	FRE
MW-24	3.5 - 15	FRE
MW-25	4 - 9	FRE
MW-26	3.5 - 15	FRE
MW-27	4 - 9	FRE

NOTE: The shaded wells were installed during the Phase II Investigation.

The locations of monitoring wells MW-15, MW-16, and MW-17, in the entrance gate area, were selected to delineate the downgradient extent of the liquid-phase hydrocarbon plume, which also correlates very closely to the extent of soils above 473 ppm total PAHs (the proposed risk derived remediation goal). Based on the adsorbed hydrocarbon levels detected in the soils at monitoring well MW-17 from an immunoassay field testing kit, monitoring well MW-20 was installed along the east side of the Osmose facility to define a "clean line" in the soil concentrations. Soil borings at these four locations were advanced to a depth of 20 feet below grade to collect soil samples to that depth. This was achieved by advancing the augers to a depth of 16 feet, sampling to 18 feet with a 3" split spoon, and then sampling to 20 feet with a 2" split spoon. The wells were installed at 16 feet with the screened interval extending from 5.5 to 15.5 feet below grade.

Based on the hydrocarbon levels detected in the soils at monitoring well MW-16 (adjacent to the sewer encasement), monitoring wells MW-21 and MW-22 were installed to determine soil and shallow groundwater quality on the east (downgradient) side of the sewer line. Monitoring well MW-21 was installed and constructed in the same manner as monitoring well MW-16. At the location of monitoring well MW-22, the boring was advanced to a depth of 25 feet below grade to collect soil samples to that depth. The augers were then withdrawn to a depth of 15 feet to allow native soils from the surrounding formation to close the borehole below that depth. At that point the monitoring well was installed with the screened interval extending from 3.5 to 15 feet below grade.

Laboratory analysis of soils from monitoring well MW-16 (collected during the first Phase II drilling event) detected total PAH levels in excess of 473 ppm. In accordance with the Phase II Work Plan, this necessitated the installation of an additional monitoring well, labelled MW-25, approximately 50 feet north of MW-16, to determine the extent of liquid-phase hydrocarbon migration along the sewer encasement beneath Ellicott Street. Information provided by the Buffalo Sewer Authority indicated that the sewer system slopes toward the north, and has a depth of approximately 8 feet below grade. Monitoring well MW-25 was installed to a depth of 9 feet, with the screened interval extending from 4 to 9 feet.

During the installation of monitoring well MW-25, liquid-phase hydrocarbons were observed in the soil samples. In accordance with the Phase II Work Plan, an additional monitoring well, labelled MW-27, was installed approximately 50 feet north of MW-25. Monitoring well MW-27 was installed and constructed in the same manner as monitoring well MW-25. A field immunoassay test of soils from MW-27 (described in the Phase II Work Plan) indicated that PAH levels were below 473 ppm, and therefore no additional wells were required farther north along the sewer line. This field test result was later confirmed by laboratory analysis of soil samples collected from the boring.

The location of monitoring well MW-24 was chosen to define the upgradient extent of the liquid-phase hydrocarbon plume and soils above 473 ppm total PAHs in the vicinity of abandoned product transfer lines running between the former tank pit and the Osmose building. The lines were capped and abandoned during the closure of the three USTs in August of 1989. Based on a field immunoassay test of soils from monitoring well MW-24, monitoring well MW-26 was installed farther west (upgradient) along the south side of the Osmose building. Soil borings at both these locations were advanced to a depth of 20 feet below grade to collect soil samples to that depth. This was achieved by advancing the augers to a depth of 16 feet, sampling to 18 feet with a 3-inch split spoon, and then sampling to 20 feet with a 2-inch split spoon. The wells were installed at 15.5 feet with the screened interval extending from 3.5 to 15 feet below grade.

Monitoring well MW-23 was installed just north of the Pilot Plant building in order to monitor soil and shallow groundwater quality along the southeastern side of the Osmose property. It was installed and constructed in the same manner as monitoring well MW-24.

Two deep soil borings were installed during the Phase II Investigation. Since data from the two existing deep wells indicated that the direction of deep groundwater flow differed from the direction of shallow groundwater flow, the additional borings were located to provide additional data on the deep groundwater gradient and the possible presence of DNAPL.

Both borings were advanced to the top of bedrock and were completed as monitoring wells. Monitoring well MW-18 was located along the southern side of the site and was installed to a depth of 58 feet below grade, with the screened interval extending from 53 to 58 feet. Monitoring well MW-19 was located along the western side of the site, and was installed to a depth of 54 feet below grade, with the screened interval extending from 49 to 54 feet.

All monitoring wells were constructed of threaded, flush-joint fiberglass-reinforced epoxy (FRE) well screen (0.020-inch slotted) and casing. A clean, graded sand pack was placed in the annulus between the well and the borehole throughout the screened interval. Monitoring well construction logs are presented in Appendix C, Well Logs. A bentonite seal was placed above the sand pack. A cement-bentonite grout was placed above the bentonite seal up to one foot below grade. All wells were completed with flush-mounted, traffic-approved road boxes and locking well caps.

Soils removed from the subsurface during drilling operations (cuttings/spoils) were stored on site in DOT-approved 55-gallon drums pending the completion of a waste characterization profile. The soils will be properly disposed of by Osmose.

2.2 Subsurface Soil Samples

During soil boring installation, soil samples were continuously collected at all locations (except as noted in Section 2.1) and monitored with a field PID. In addition, samples from 12 borings were sent for analysis at the contract laboratory.

From all shallow borings except MW-25 and MW-27, three samples were chosen for laboratory analysis: the samples from above and below the water table that yielded the highest readings with the PID, and the sample from the deepest interval. Borings MW-25 and MW-27 were installed to 9 feet below grade along the sewer encasement to monitor for LNAPL and soils with adsorbed PAHs above 473 ppm. Since liquid-phase hydrocarbons were visible in the soils at MW-25, no laboratory samples were collected. One laboratory sample was collected from MW-27 to verify that PAH levels in the soil at that location were below 473 ppm.

From the two deep borings, two soil samples were chosen for laboratory analysis: the sample from above the water table that yielded the highest readings with the PID, and the soil sample from the deepest interval. Table 2-2 summarizes the soil samples from the Phase II Investigation which were selected for laboratory analysis.

Soil sampling equipment, procedures, preservation techniques and decontamination procedures are specified in the Subsurface Investigation Work Plan: Appendix D, Project-Specific QA/QC Plan (Section 6.2). Additional soil samples required for QA/QC purposes are described in Section 3.0 of this report.

TABLE 2-2
Summary of Subsurface Soil Sample Locations

BORING ID	INTERVALS SAMPLED	LABORATORY ANALYSES
MW-15	6 - 8 feet 8 - 10 feet 18 - 20 feet	EPA 8310, EPA 8020
MW-16	6 - 7 feet 7 - 8 feet 18 - 20 feet	EPA 8310, EPA 8020
MW-17	2 - 4 feet 8 - 10 feet 18 - 20 feet	EPA 8310, EPA 8020
MW-18	2 - 4 feet 39 - 41 feet 57 - 58 feet	EPA 8310, EPA 8020
MW-19	2 - 4 feet 54 - 55 feet	EPA 8310, EPA 8020
MW-20	6 - 7 feet 7 - 8 feet 18 - 20 feet	EPA 8310, EPA 8020
MW-21	6 - 7 feet 7 - 8 feet 18 - 20 feet	EPA 8310, EPA 8020
MW-22	4 - 6 feet 10 - 12 feet 23 - 25 feet	EPA 8310, EPA 8020
MW-23	6 - 8 feet 16 - 18 feet 18 - 20 feet	EPA 8310, EPA 8020
MW-24	8 - 10 feet 10 - 12 feet 18 - 20 feet	EPA 8310, EPA 8020
MW-25	NONE	N/A
MW-26	8 - 10 feet 10 - 12 feet 18 - 20 feet	EPA 8310, EPA 8020
MW-27	7 - 8 feet	EPA 8310, EPA 8020

2.3 Monitoring Well Development

Following installation, the monitoring wells were allowed to sit for a minimum of 24 hours to equilibrate before development. The monitoring wells were developed by repetitive surging and bailing until either:

1) the turbidity level was less than 50 Nephelometric Turbidity Units (NTUs) as measured with a portable turbidity meter;

2) the well had been developed 3 - 5 well volumes; or

3) the well was bailed dry.

The water generated during well development was stored on site in DOT-approved 55-gallon drums for proper disposal by Osmose.

2.4 Groundwater Elevation Survey

For all existing monitoring wells, top-of-casing elevations were surveyed to a common datum (assumed 100 foot elevation assigned to the top of the fire hydrant at Ellicott and Edna Streets) to allow comparison of groundwater elevations to data previously collected. The depth to groundwater at each monitoring well was measured to an accuracy of +/-0.01 feet with an electronic Interface Probe (IP).

2.5 Groundwater Sample Collection

Monitoring wells were left undisturbed for a minimum of one week after development to allow time for the wells to equilibrate with the surrounding aquifer. Groundwater samples were collected from all FRE wells on site that did not contain liquid-phase hydrocarbons, with the exception of monitoring wells MW-25 and MW-27, which were monitored for liquid-phase hydrocarbons only. A total of 17 wells were sampled during December 1992, February 1993, and March 1993.

Two rounds of groundwater samples were collected from the deep wells on site during this phase of the investigation. Three of the four deep wells were sampled in December, 1992. At that time, monitoring well MW-18 was not sampled because an apparent sheen was measured with an interface probe in the well with an IP after development. The sheen was not confirmed visually using an acrylic bailer. As a result of the apparent sheen detected in MW-18 and the anomalously high levels of dissolved compounds that were detected during that sampling round in monitoring well MW-14 (5,600 μg/l versus

180 μg/kg total PAHs in soils total dissolved PAHs), another deep groundwater sampling round was performed in February, 1993. At that time no sheens were observed and all four deep wells were sampled.

Prior to sample collection, 3 to 5 well volumes of water were evacuated from each well. A bailer was used for the evacuation of the wells. The purged water was stored on site in DOT-approved 55-gallon drums for proper disposal by Osmose. Before sampling, the turbidity of each well was measured and recorded in the field notebook.

All FRE wells on site were sampled from lowest VOC concentration to highest, based upon historical results from previously sampled wells and soil screening levels observed during drilling. After evacuation of each well, samples were collected for field analysis of temperature, pH and conductivity. Following field analysis, samples were collected and shipped to the contract laboratory for analysis for Aromatic Volatile Organics by EPA Method 8020 and PAHs by EPA Method 8310.

The groundwater gauging and field measurements are included in Appendix D.

All water samples were collected using clean disposable bailers and rope. Water samples collected for laboratory analysis were poured directly from the bailers into properly prepared laboratory jars, and placed on ice until delivery to the contract laboratory. Proper chain-of-custody procedures were employed throughout the sampling. Sampling procedures are specified in detail in the Subsurface Investigation Work Plan: Appendix D, Project-Specific QA/QC Plan.

2.6 Surface Soil Sampling

During closure of the 3 USTs on August, 1989, soils containing elevated levels of hydrocarbons were staged on polyethylene liners, awaiting NYSDEC approval of the Interim Remedial Measure (IRM). The soils were covered with polyethylene sheets to prevent erosion and transport of contaminants by wind or rain.

In order to determine whether off-site migration of hydrocarbons occurred onto adjoining properties, surface grab samples were collected from the properties to the south and west of the Osmose facility which are owned by the Niagara Frontier Transit Authority (NFTA). The access agreement negotiated between NFTA and Osmose is on file at Osmose and Groundwater Technology.

Three surface grab samples were collected from the adjoining NFTA properties during the Supplemental Investigation (SS-1, SS-2, and SS-3). Based on the PAH concentrations detected in those samples, it was determined that six additional surface soil samples would be collected to:

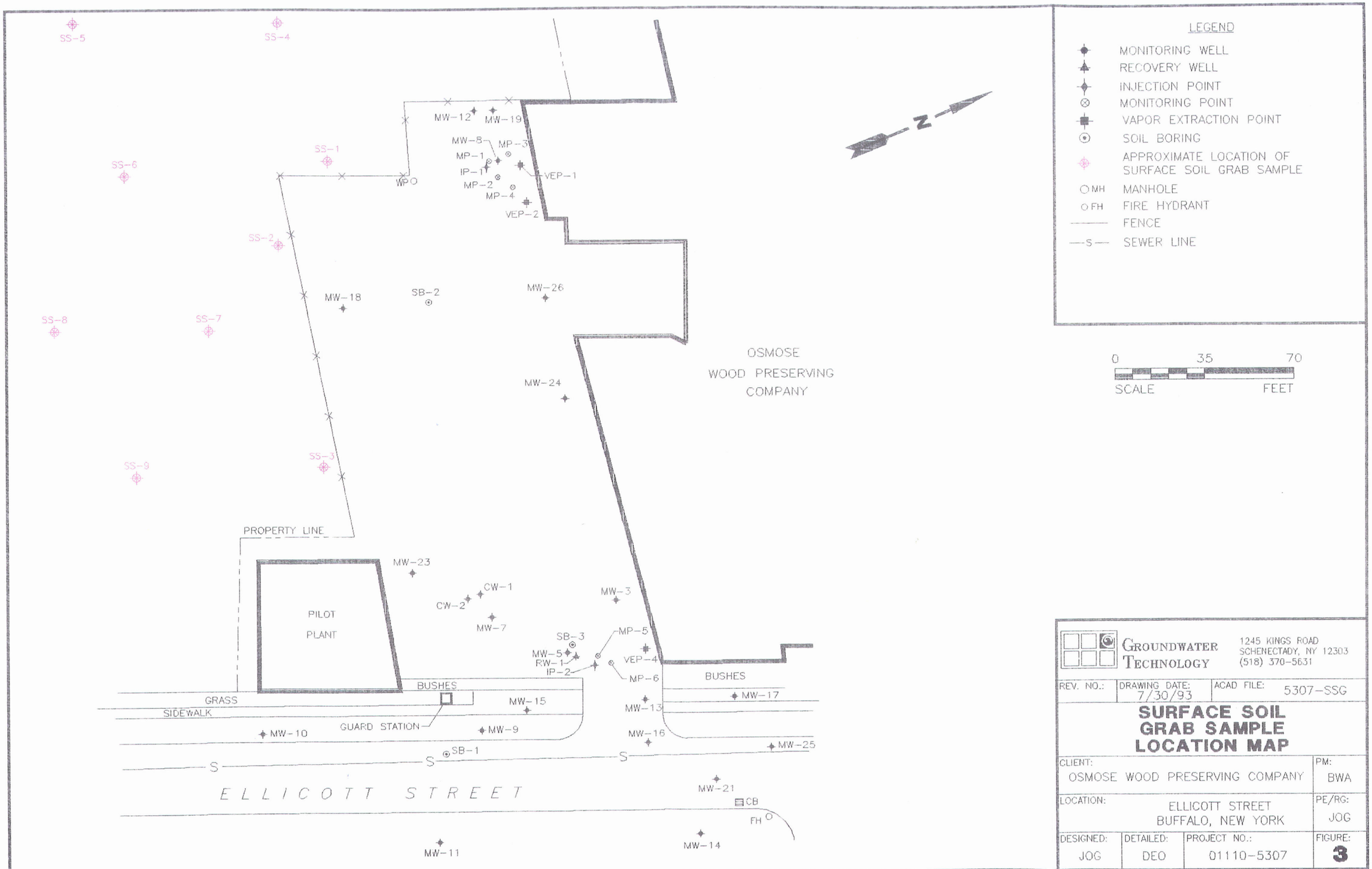
- Define the areas of past brush fires, and
- Determine if a lateral PAH concentration gradient exists in surface soils.

Locations where the surface soil samples were collected are shown in Figure 3, Surface Soil Grab Sample Locations. The samples were collected within the vacant lot on June 29, 1993, at various distances from the fence marking the Osmose property line. The samples were sent to the contract laboratory for analysis of PAHs by EPA Method 8310.

The surface soil samples (SS-4, SS-5, SS-6, SS-7, SS-8, and SS-9) were collected by removing the sod and sampling the soil at a depth of approximately 3 to 6 inches below grade. The samples were collected with a stainless steel trowel, which was decontaminated between locations as described in the Quality Assurance Project Plan.

FIGURE 3

SOIL GRAB SAMPLE LOCATIONS



GROUNDWATER TECHNOLOGY
1245 KINGS ROAD
SCHENECTADY, NY 12303
(518) 370-5631

REV. NO.:	DRAWING DATE:	ACAD FILE:
	7/30/93	5307-SSG

SURFACE SOIL GRAB SAMPLE LOCATION MAP

CLIENT:	PM:
OSMOSE WOOD PRESERVING COMPANY	BWA
LOCATION: ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	DEO	01110-5307	3

2.7 Municipal Sewer System Sample Collection

In January, 1993, water samples were collected from the municipal sanitary/storm sewer system that flows beneath Ellicott Street in front of the Osmose facility. Two samples were collected: one upstream from Osmose at the intersection of Ellicott and Best Streets, and one directly in front of the Osmose facility at the intersection of Ellicott Street and Edna Place. A third sample which had been proposed from the sewer line beneath Edna Place was not taken after verification was received from the Buffalo Sewer Authority (BSA) that the sewer line under Edna Place flows toward the east, and does not tie into the sewer which runs beneath Ellicott Street.

The sewer water samples were collected using a clean disposable bailer and rope. The samples were poured directly from the bailers into properly prepared laboratory jars, placed on ice, and delivered to the contract laboratory. Proper chain-of-custody procedures were employed throughout the sampling. Analysis was performed for PAHs by EPA Method 8310. As described in the November 16, 1992 letter correspondence (Appendix A), due to the qualitative nature of the data quality objectives and the inherent variability in sampling sewer lines, the laboratory reporting conformed to a standard QA/QC format.

2.8 Decontamination

Drilling equipment was decontaminated between boreholes. A steam cleaner was used to decontaminate augers, drill rods, spoon samplers, and other equipment that contacted contaminated soil or groundwater.

Bailers, interface probes, and other sampling equipment were decontaminated as specified in the *Subsurface Investigation Work Plan: Appendix D, Project Specific QA/QC Plan.*

2.9 Sample Management and Quality Control

The sample management and quality control procedures undertaken during sampling and analysis for this site are specified in Appendix D of the Subsurface Investigation Work Plan. Table 2-3 summarizes the quality control samples which were collected for this investigation. The contract laboratory's data package deliverables conform to a "Project-Specific Blue Level Package". The "Blue Level Package" reports the results of method blanks, surrogate recoveries, and matrix spike recoveries along with precision data and a QA non-conformance summary.

TABLE 2-3
QA/QC Samples

	QA/QC SAMPLE	EPA 8020 (VOCs)	EPA 8310 (PAHs)
Soil Sampling	Trip Blank	2	0[1]
	Field Blank	1	1
	Rinseate Blank	2	2
	Blind Duplicate	1	1
Groundwater Sampling	Trip Blank	1	0[1]
	Field Blank	1	1
	Rinseate Blank[2]	0	0

[1] Trip blanks are not required for PAH analysis.
[2] No rinseate blank was required for groundwater sampling because disposable bailers were used.

2.10 Data Validation

The data collected during the field investigation was submitted to Ms. Andrea Schuessler of ChemWorld Environmental, Inc., for QA/QC review. Ms. Schuessler has been approved by Ms. Maureen Sarafini of the NYSDEC to validate data in New York State. The data validation procedure included the review of all data for:

- completeness,
- correctness,
- accuracy,
- precision, and
- representativeness.

The Data Validation Report is included in Appendix E.

3.0 FIELD INVESTIGATION RESULTS

3.1 Geologic Evaluation

3.1.1 Regional Geology

Unconsolidated deposits in the region consist of glacial till, glacial outwash, fine grained glacial lake deposits, recent swamp deposits, and alluvium. The glacial lake deposits are composed of fine sand, silt and clay.

The bedrock in the area of investigation is the Onondaga Limestone. Regionally, the Onondaga Limestone dips gently to the south-southwest (Staubits and Miller, 1987) and has been encountered at depths ranging from above surface elevation (outcrops along Kensington Expressway) to 63 feet below grade (this investigation). The upper surface is typically irregular and contains deeply incised glacially carved channels, sink holes and solution features.

3.1.2 Site Geology

The subsurface geology encountered during this drilling event was consistent with that described in the initial Subsurface Investigation Report and the Supplemental Investigation Report. The site is underlain by approximately 58 to 63 feet of unconsolidated clay, silt, sand and gravel deposits which rest directly upon the bedrock. These deposits are fairly typical of glacial deposits of the area, and exhibit varied permeability. The area of highest relative permeability is the fill material (located in the upper few feet of section) and the native sand and gravel deposits.

A clay and silt horizon, with an upper boundary located approximately 2 to 5 feet below grade, presents the least permeable zone observed. This clay and silt unit, composed primarily of extremely low permeability glacial lake deposits, has been encountered in all wells drilled on site and ranges in thickness from approximately 7 to 12 feet. Below this, the glacial lake deposits become coarser-grained silts and fine sands. The glacial lake deposits are underlain by glacial outwash deposits at approximately 20 to 25 feet below grade. Split-spoon samples and drill cuttings from the four deep wells installed to date indicate that stratified glacial outwash deposits are present throughout the remainder of the overburden to the total depth of 58 to 63 feet. These deposits consist of inter-layered silts, sands, and gravels of relatively high permeability. Presented in Figures 4a and 4b are geologic cross sections along two different axes across the Osmose site. The contacts between the glacial lake deposits and the glacial outwash deposits, based on the well logs, are marked with correlation lines in the cross sections.

FIGURE 4a

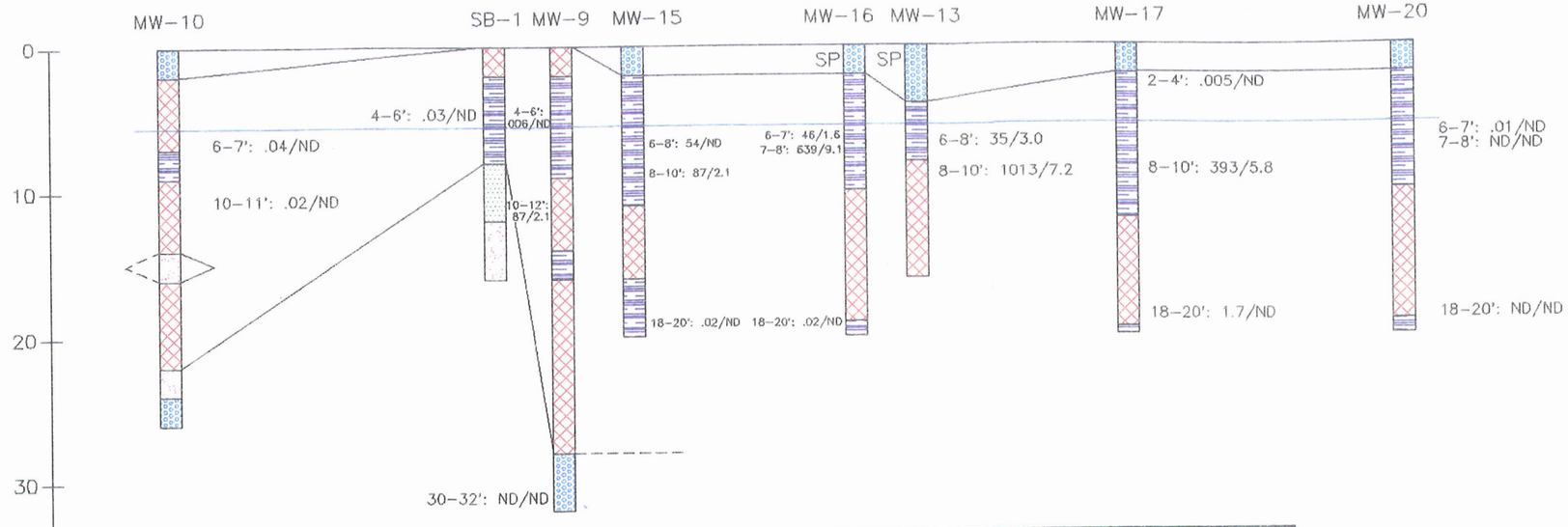
GEOLOGIC CROSS SECTION A - A'

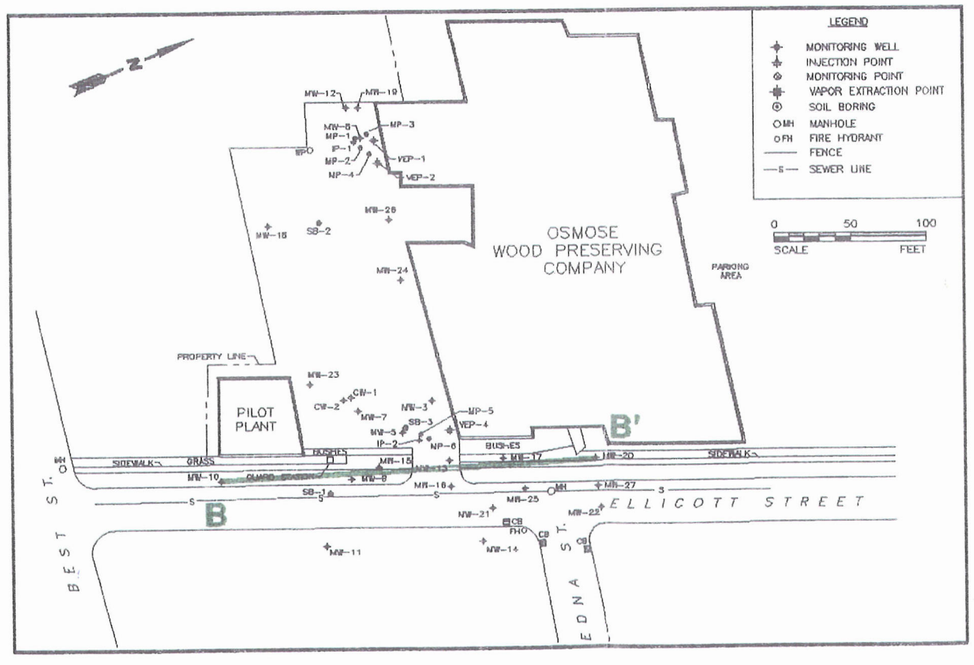
FIGURE 4b

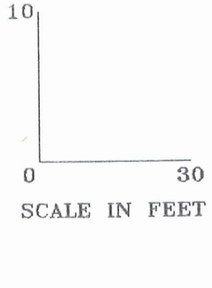
GEOLOGIC CROSS SECTION B - B'

SOUTH
B

NORTH
B'







LEGEND

GLACIAL OUTWASH DEPOSITS AND FILL
- FINE SANDS
- FINE TO COARSE SANDS WITH SILT/CLAY
- COARSE SANDS WITH GRAVEL
- SILTY SANDS WITH GRAVEL

GLACIAL LAKE DEPOSITS
- SILTY SANDS, SILTS, CLAYEY SANDS
- CLAY

2-4': .005/ND DEPTH: (FT.) PAHs/VOCs (ppm) (ppm)

SP- SEPARATE PHASE PRESENT IN WELL
ND- NONE DETECTED

STATIC WATER TABLE (12/17/92)

GROUNDWATER TECHNOLOGY
1245 KINGS RD
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(518) 370-5631

REV. NO.:	DRAWING DATE:	ACAD FILE:
	1/29/93	5307-7X

CROSS-SECTION B - B'

CLIENT:		PM:
OSMOSE WOOD PRESERVING INC.		BWA
LOCATION:	980 ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	MET/DEO	01110-5307	4B

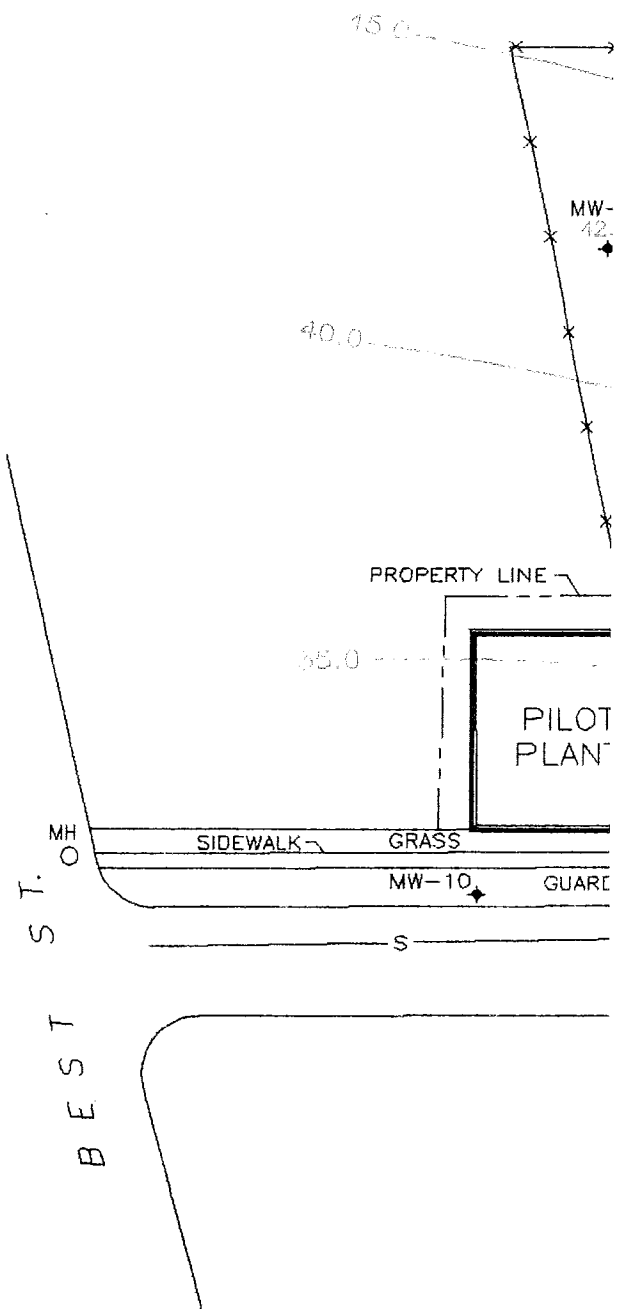
Bedrock has been encountered on site at depths ranging from 58 to 63 feet below grade. The bedrock surface slopes toward the southeast, with the top of bedrock at monitoring well MW-19 located approximately 12 feet higher than the top of bedrock at monitoring well MW-14. A bedrock surface contour map has been developed and is included as Figure 5. An assumed datum of 100 feet was assigned to the benchmark (fire hydrant) as described in Section 2.4.

Soil borings along the west side of the sewer line beneath Ellicott Street (MW-25 and MW-27) did not reveal the presence of a permeable bedding material. Both soil borings were located within 6 inches of the sewer line and indicated the presence of silts and clays from grade to the bottom of the boring (9 feet). These soils are typical of the geology across the site at similar depths.

As part of a separate scope of work underway at the Osmose facility (an ozone injection pilot test), soil samples were analyzed for grain size distribution. Two samples were analyzed by sieve and hydrometer. The results indicate that the "clay" portion of the clay and silt horizon described above contains a wide distribution of grain sizes, with approximately 25 percent clay, 50 percent silt, and 25 percent sand. The "silt" portion of the clay and silt horizon contains a narrower distribution of grain sizes, with approximately 65 percent silt and 35 percent sand.

Figure 5

Bedrock Surface Contour Map



LEGEND

- PRE-EXISTING MONITORING WELL
- PHASE II MONITORING WELL
- INJECTION POINT
- MONITORING POINT
- VAPOR EXTRACTION POINT
- SOIL BORING
- MH MANHOLE
- FH FIRE HYDRANT
- FENCE
- S SEWER LINE
- 35.5 BEDROCK ELEVATION (feet)
- 40.0 BEDROCK CONTOUR (feet)
- BM BENCHMARK – TOP NUT OF FIRE HYDRANT –ASSUMED ELEVATION = 100'

0 50 100

SCALE FEET

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REV. NO.:	DRAWING DATE: 8/13/93	ACAD FILE: 7905-BSC

BEDROCK SURFACE CONTOUR MAP

CLIENT:		PM:
OSMOSE WOOD PRESERVING COMPANY		BWA
LOCATION:	ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	TRS/DEO	01110-7905	5

FIGURE 6

VOCS IN SUBSURFACE SOILS

3.2 Subsurface Soil Sampling Results

As described above, the Phase II Investigation included the installation of 13 soil borings/monitoring wells (labelled MW-15 through MW-27). Soil samples were collected from most borings at three separate intervals, as indicated in Table 2-2. The samples were sent to the contract laboratory for analysis for Aromatic Volatile Organic Compounds (VOCs) by Modified EPA Method 8020, and for PAHs by EPA Method 8310. Samples were analyzed from intervals ranging from 2 to 58 feet below grade.

3.2.1 Volatile Organic Compounds

A summary of the results of the VOC analyses of soil samples collected during this investigation are presented in Table 3-1. For reference, the tables of soil sampling results include data collected from earlier phases of the investigation. In this section, however, the discussion of the results will be primarily focused on the data collected during the Phase II Investigation.

As indicated in Table 3-1, 27 of 33 soil samples contained no volatile compounds. Benzene, ethyl benzene, chlorobenzene, and 1,3-dichlorobenzene were not detected in any of the soil samples. Toluene was detected at only one location, in the 8 to 10 foot interval of MW-17, at a concentration of 360 μg/kg. Similarly, chlorinated compounds were detected at only one location, in the 8 to 10 foot interval of MW-26, at concentrations of 220 μg/kg (1,2-dichlorobenzene) and 430 μg/kg (1,4-dichlorobenzene).

Xylenes were the predominant volatile compounds detected on site. Xylenes were present at five of the six locations where volatile compounds were detected, in concentrations ranging from 220 μg/kg (MW-24) to 9,100 μg/kg (MW-16). Site wide, xylenes constitute approximately 81% of the volatiles detected in soils. Where present, xylenes were generally located from 8 to 10 feet below grade.

No volatile compounds were detected in soil samples from borings along the southern edge of the Osmose property (MW-18, MW-23), from borings on the east side of the sewer line (MW-21, MW-22), or from the two borings farthest north along the east side of the Osmose building (MW-20, MW-27). In addition, no volatile compounds were detected below a depth of 10 feet at any of the sampling locations during this sampling event. Previously, low levels of VOCs were, however, detected on the western (upgradient) property boundary at MW-12 (17-25 μg/kg).

A map depicting the horizontal and vertical distribution of VOCs detected in subsurface soils is presented as Figure 6. Complete laboratory analytical reports are included in Appendix F.

TABLE 3-1
VOCs IN SUBSURFACE SOILS (µg/kg)
EPA Method 8020

	SB-1	SB-2		CW-1				CW-2	MW-8		MW-9			MW-10		MW-11	
Interval Sampled	4'-6'	2'-4'	8'-10'	6'-8'	8'-10'	30'-32'	62'-64'	6'-8'	2'-4'	16'-18'	4'-6'	10'-12'	30'-32'	6'-8'	10'-12'	4'-6'	10'-12'
Date Sampled	10/90	3/92	3/92	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90	10/90
benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
toluene	ND	ND	6.8	ND	250	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ethyl benzene	ND	ND	2.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes (total)	ND	ND	11	ND	4,200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
chlorobenzene	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-dichlorobenzene	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-dichlorobenzene	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-dichlorobenzene	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Volatiles	ND	ND	20	ND	4,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

	MW-12		MW-13		MW-14	
Interval Sampled	6'-8'	18'-20'	6'-8'	8'-10'	10'-12'	61'-63'
Date Sampled	3/92	3/92	3/92	3/92	3/92	3/92
benzene	ND	ND	ND	ND	ND	ND
toluene	7.5	5.8	ND	380	ND	4.1
ethyl benzene	3.2	2.0	ND	520	ND	2.0
xylenes (total)	14	9.3	3,000	6,300	ND	8.3
chlorobenzene	ND	ND	ND	ND	ND	ND
1,2-dichlorobenzene	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	ND	ND	ND	ND	ND	ND
1,4-dichlorobenzene	ND	ND	ND	ND	ND	ND
Total Volatiles	25	17	3,000	7,200	ND	14

KEY
ND = not detected
- = not analyzed

GROUNDWATER TECHNOLOGY

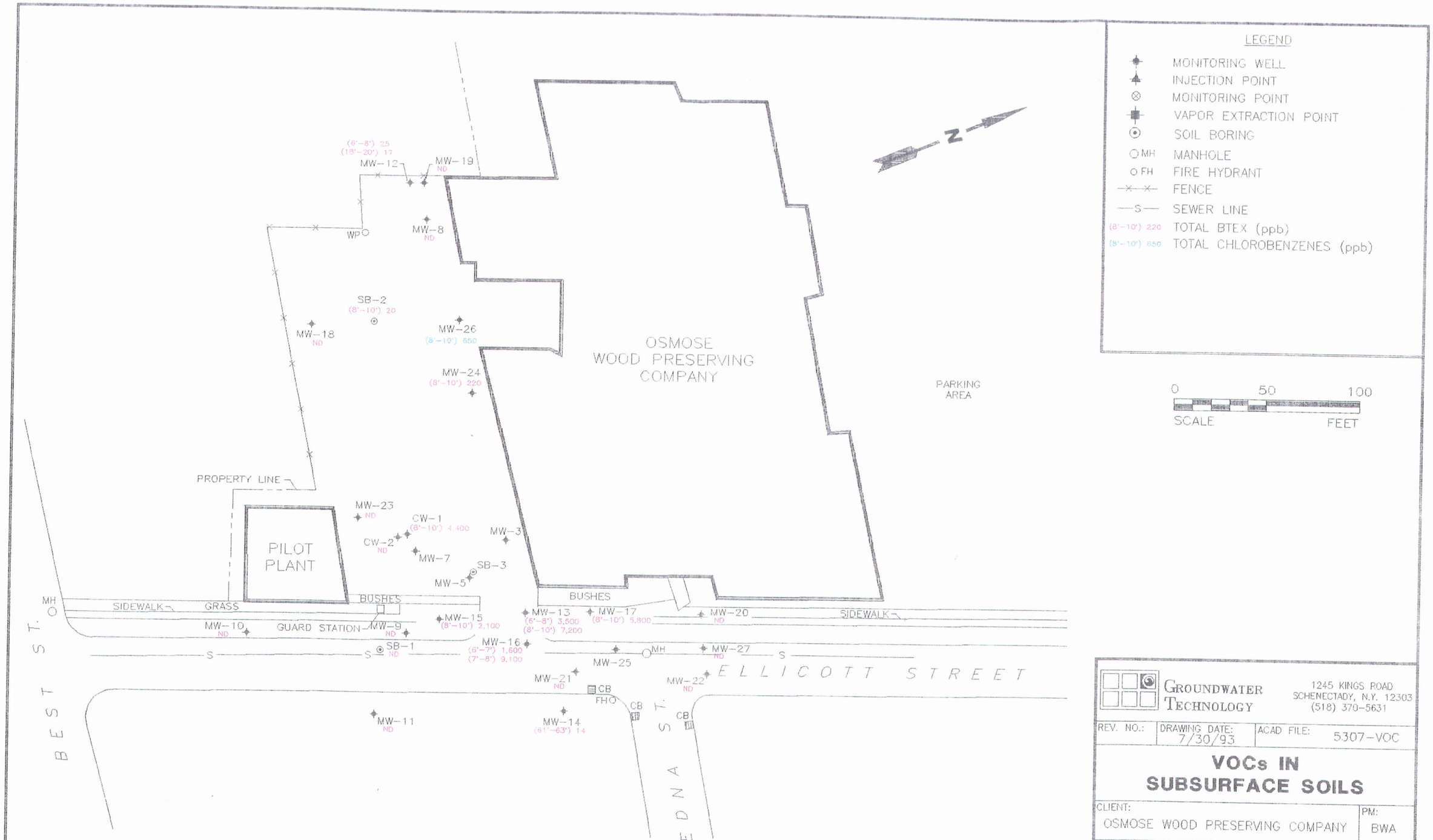
TABLE 3-1 (cont'd)
VOCs IN SUBSURFACE SOILS (µg/kg)
EPA Method 8020

	MW-15			MW-16			MW-17			MW-18			MW-19		MW-20			MW-21			MW-22		
Interval Sampled	6'-8'	8'-10'	18'-20'	6'-7'	7'-8'	18'-20'	2'-4'	6'-10'	18'-20'	2'-4'	39'-41'	57'-58'	2'-4'	54'-55'	6'-7'	7'-8'	18'-20'	6'-7'	7'-8'	18'-20'	4'-6'	10'-12'	23'-25'
Date Sampled	12/3/92	12/3/92	12/3/92	12/3/92	12/3/92	12/3/92	12/2/92	12/2/92	12/2/92	11/17/92	11/17/92	11/17/92	11/19/92	11/19/92	12/4/92	12/4/92	12/4/92	12/4/92	12/4/92	12/4/92	2/18/93	2/18/93	2/18/93
benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
toluene	ND	ND	ND	ND	ND	ND	ND	360	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes (total)	ND	2,100	ND	1,600	9,100	ND	ND	5,400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Volatiles	ND	2,100	ND	1,600	9,100	ND	ND	5,800	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

	MW-23			MW-24			MW-26			MW-27	DUP-2
Interval Sampled	6'-8'	16'-18'	18'-20'	8'-10'	10'-12'	18'-20'	8'-10'	10'-12'	18'-20'	7'-9'	MW-18 2'-4'
Date Sampled	2/17/93	2/17/93	2/17/93	2/16/93	2/16/93	2/16/93	2/17/93	2/17/93	2/17/93	2/19/93	11/20/92
benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ethyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
xylenes (total)	ND	ND	ND	220	ND	ND	ND	ND	ND	ND	ND
chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-dichlorobenzene	ND	ND	ND	ND	ND	ND	220	ND	ND	ND	ND
1,3-dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-dichlorobenzene	ND	ND	ND	ND	ND	ND	430	ND	ND	ND	ND
Total Volatiles	ND	ND	ND	220	ND	ND	650	ND	ND	ND	ND

KEY
ND = not detected

GROUNDWATER TECHNOLOGY



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REV. NO.:	DRAWING DATE:	ACAD FILE:
	7/30/93	5307-VOC

VOCs IN SUBSURFACE SOILS

CLIENT:		PM:
OSMOSE WOOD PRESERVING COMPANY		BWA
LOCATION: ELLICOTT STREET BUFFALO, NEW YORK		PE/RG: JOG
DESIGNED: JOG	DETAILED: DEO	PROJECT NO.: 01110-5307
		FIGURE: 6

3.2.2 Semi-volatile Compounds

Presented in Table 3-2, PAHs in Subsurface Soils, is a summary of the results of the laboratory data from the EPA 8310 analyses of the soil samples collected during the Phase II Investigation (MW-15 through MW-27). As with the data presented for the volatile compounds in Section 3.2.1, PAH data from all previous sampling events is included in the table (MW-8 through MW-14) for convenience. The discussion presented in this section, however, will focus on the soil samples collected during the most recent event. Presented in Section 4.0 is an interpretation of the entire library of PAH data collected to date at the Osmose site.

No PAH compounds were detected in 10 of the 33 soil samples analyzed during the Phase II Investigation (MW-19 at 54'-55', MW-20 at 7'-8', MW-20 at 18'-20', MW-22 at 10'-12', MW-22 at 23'-25'. MW-23 at 16'-18', MW-23 at 18'-20', MW-25 at 10'-12', MW-25 at 18'-20' and MW-27 at 7'-8'). Additionally, low levels (<10 μg/kg) were present at 10 locations (MW-15 at 18'-20', MW-17 at 2'-4', MW-18 at 39'-41', MW-20 at 6'-7', MW-21 at 6'-7', MW-21 at 7'-8', MW-21 at 18'-20', MW-22 at 4'-6', MW-23 at 6'-8' and MW-24 at 18'-20').

The highest levels of PAH compounds were encountered in the soil samples from MW-16 at 7'-8' (638,523 μg/kg) and MW-17 at 8-10' (392,945 μg/kg). As would be expected, these are the locations which also exhibited the highest concentrations of VOCs. Both of these locations are located downgradient of the former tank pit. Monitoring well MW-17 is located on the Osmose property, while MW-16 is located on the western side of the sewer line which runs beneath Ellicott Street. Phenanthrene, 2-Methylnaphthalene, and Naphthalene were the PAH analytes present in the highest concentrations in the samples analyzed. Each of these compounds are classified as non-carcinogenic by the USEPA.

For the purposes of further discussion, the PAH analytes reported will be divided into three groups:

- lower complexity (C10-C13)
- medium complexity (C14-C16)
- highly condensed (C18-C22)

At MW-15, MW-16, MW-17, MW-24 and MW-26, the lower and medium complexity PAHs were present in similar predominance (approximately 49% and 45%, respectively). The highly condensed PAHs comprised of a much lower percentage of the total PAHs (approximately 4-6%). At the locations where

TABLE 3–2

PAHS IN SUBSURFACE SOILS (ug/kg)

EPA Method 8310

ANALYTE	CN	MW–8	MW–8	MW–9	MW–9	MW–9	MW–10	MW–10	MW–11	MW–11	MW–12	MW–12	MW–13	MW–13	MW–14	MW–14	MW–15	MW–15
Interval Sampled		2'–4'	16'–18'	4'–6'	10'–12'	30'–32'	6'–8'	10'–12'	4'–6'	10'–12'	6'–8'	18'–20'	6'–8'	8'–10'	10'–12'	61'–63'	6'–8'	8'–10'
Date Sampled																		
Naphthalene	C10	12000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7000	230000	ND	ND	2600	10000
Acenaphthylene	C12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	180
1–Methylnaphthalene	C11	1200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2000	57000	ND	ND	990	1800
2–Methylnaphthalene	C11	4000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9100	300000	ND	ND	8400	17000
Acenapthene	C12	3200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3000	120000	ND	ND	3000	6300
Fluorene	C13	3200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2200	68000	ND	ND	2600	4800
Phenanthrene	C14	36000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9000	150000	ND	ND	17000	23000
Anthracene	C14	180000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	320	10000	ND	ND	2100	2200
Fluoranthene	C16	43000	ND	ND	ND	ND	ND	ND	11	ND	18	ND	1900	59000	ND	32	5700	6800
Pyrene	C16	120000	ND	ND	ND	ND	27	16	28	ND	ND	ND	ND	ND	ND	ND	11000	11000
Benzo{a}anthracene	C18	17000	1.8	1.7	ND	ND	3.8	1.7	4.9	ND	4.1	ND	230	7500	ND	11	ND	1300
Chrysene	C18	15000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	72	2600	ND	ND	ND	1800
Benzo{b}fluoranthene	C20	14000	1.5	1.7	ND	ND	4.9	2.2	6.6	ND	5.8	.78	75	2700	ND	9.5	270	270
Benzo{k}fluoranthene	C20	7600	ND	.88	ND	ND	2	ND	2.9	ND	3.4	ND	52	1800	ND	6.3	120	130
Benzo{a}pyrene	C20	18000	1.6	1.7	ND	ND	4.6	.88	6.2	ND	6.0	ND	92	2900	ND	12	220	240
Dibenzo{a,h}anthracene	C22	3700	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	200	ND	1.2	9	8.9
Benzo{g,h,i}perylene	C22	13000	ND	ND	ND	ND	ND	2.8	6.3	ND	3.5	ND	43	1100	ND	8.6	51	66
Indeno{1,2,3–cd}pyrene	C22	10000	ND	ND	ND	ND	ND	ND	5.9	ND	2.4	ND	ND	450	ND	5.1	59	61
TOTAL SEMIVOLATILES		500000	4.9	6.0	0	0	42	24	72	0	43	0.78	35000	1000000	0	86	54000	87000

ND = not detected

CN = carbon number

TABLE 3–2 con't

PAHS IN SUBSURFACE SOILS (ug/kg)

EPA Method 8310

ANALYTE	CN	MW–15	MW–16	MW–16	MW–16	MW–17	MW–17	MW–17	MW–18	MW–18	MW–18	MW–19	MW–19	MW–20	MW–20	MW–20	MW–21	MW–21
Interval Sampled		18'–20'	6'–7'	7'–8'	18'–20'	2'–4'	8'–10'	18'–20'	2'–4'	39'–41'	57'–58'	2'–4'	54'–55'	6'–7'	7'–8'	18'–20'	6'–7'	7'–8'
Date Sampled																		
Naphthalene	C10	ND	4800	90000	ND	ND	68000	1200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	C12	ND	130	2100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1–Methylnaphthalene	C11	ND	1200	24000	ND	ND	8500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2–Methylnaphthalene	C11	ND	10000	170000	ND	ND	69000	190	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenapthene	C12	ND	3200	61000	ND	ND	25000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	C13	ND	2800	41000	ND	ND	20000	48	ND	ND	ND	3100	ND	ND	ND	ND	ND	ND
Phenanthrene	C14	ND	14000	94000	ND	ND	100000	110	800	ND	32	14000	ND	ND	ND	ND	ND	ND
Anthracene	C14	ND	850	15000	ND	ND	8500	35	1100	ND	40	19000	ND	ND	ND	ND	ND	ND
Fluoranthene	C16	ND	3500	51000	13	ND	30000	48	1000	ND	31	19000	ND	ND	ND	ND	ND	ND
Pyrene	C16	ND	3300	68000	ND	ND	53000	37	800	ND	10	8800	ND	ND	ND	ND	ND	ND
Benzo{a}anthracene	C18	.72	540	5400	2	1	3100	6.7	400	1.3	9.9	7000	ND	7.4	ND	ND	.81	ND
Chrysene	C18	ND	850	11000	ND	ND	4400	11	380	ND	16	7000	ND	2.2	ND	ND	ND	ND
Benzo{b}fluoranthene	C20	.81	140	2100	2.8	2.2	1200	2.7	370	1.8	11	6100	ND	ND	ND	ND	1.4	.84
Benzo{k}fluoranthene	C20	ND	67	1000	1.5	ND	580	1.5	180	1	6.3	2900	ND	ND	ND	ND	.75	.65
Benzo{a}pyrene	C20	ND	120	1900	2	ND	1000	2.3	400	1.7	11	6400	ND	ND	ND	ND	1.1	ND
Dibenzo{a,h}anthracene	C22	ND	4.8	73	ND	ND	45	ND	65	ND	2.4	700	ND	ND	ND	ND	ND	ND
Benzo{g,h,i}perylene	C22	ND	35	500	ND	ND	340	ND	210	ND	6.9	3600	ND	ND	ND	ND	ND	ND
Indeno{1,2,3–cd}pyrene	C22	ND	26	450	ND	2.2	280	ND	360	ND	7.7	ND	ND	ND	ND	ND	ND	ND
TOTAL SEMIVOLATILES		1.5	46000	640000	21	5.4	390000	1700	6100	5.8	180	98000	0	9.6	0	0	4.1	1.5

ND = not detected

CN = carbon number

TABLE 3–2 con't

PAHS IN SUBSURFACE SOILS (ug/kg)

EPA Method 8310

ANALYTE	CN	MW–21	MW–22	MW–22	MW–22	MW–23	MW–23	MW–23	MW–24	MW–24	MW–24	MW–26	MW–26	MW–26	MW–27	SB–1	SB–2	SB–2
Interval Sampled		18'–20'	4'–6'	10'–12'	23'–25'	6'–8'	16'–18'	18'–20'	8'–10'	10'–12'	18'–20'	8'–10'	10'–12'	18'–20'	7'–8'	4'–6'	2'–4'	8'–10'
Date Sampled			2/18/93	2/18/93	2/18/93	2/17/93	2/17/93	2/17/93	2/16/93	2/16/93	2/16/93	2/17/93	2/17/93	2/17/93	2/19/93			
Naphthalene	C10	ND	ND	ND	ND	ND	ND	ND	790	1200	ND	ND	ND	ND	ND	ND	ND	320
Acenaphthylene	C12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1–Methylnaphthalene	C11	ND	ND	ND	ND	ND	ND	ND	800	910	ND	210	ND	ND	ND	ND	ND	ND
2–Methylnaphthalene	C11	ND	ND	ND	ND	ND	ND	ND	700	2400	ND	ND	ND	ND	ND	ND	ND	150
Acenapthene	C12	ND	ND	ND	ND	ND	ND	ND	150	310	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	C13	ND	ND	ND	ND	ND	ND	ND	180	290	ND	21	ND	ND	ND	ND	10	8.7
Phenanthrene	C14	ND	ND	ND	ND	ND	ND	ND	600	850	ND	230	ND	ND	ND	ND	ND	ND
Anthracene	C14	ND	ND	ND	ND	ND	ND	ND	210	1100	ND	60	ND	ND	ND	ND	92	ND
Fluoranthene	C16	ND	ND	ND	ND	ND	ND	ND	160	210	ND	30	ND	ND	ND	ND	74	ND
Pyrene	C16	ND	ND	ND	ND	ND	ND	ND	110	110	ND	ND	ND	ND	ND	14	ND	ND
Benzo{a}anthracene	C18	2.2	ND	ND	ND	ND	ND	ND	25	27	1.5	16	ND	ND	ND	2.7	26	.9
Chrysene	C18	ND	ND	ND	ND	ND	ND	ND	23	42	ND	27	ND	ND	ND	ND	9	ND
Benzo{b}fluoranthene	C20	2.5	1.3	ND	ND	4.5	ND	ND	17	14	2.2	16	ND	ND	ND	3.7	21	ND
Benzo{k}fluoranthene	C20	1.1	ND	ND	ND	ND	ND	ND	6.4	6.1	1.2	3.7	ND	ND	ND	1.5	14	ND
Benzo{a}pyrene	C20	1.9	ND	ND	ND	ND	ND	ND	14	11	1.7	12	ND	ND	ND	4.1	26	ND
Dibenzo{a,h}anthracene	C22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	ND	2.2	ND
Benzo{g,h,i}perylene	C22	ND	ND	ND	ND	ND	ND	ND	18	8.6	ND	30	ND	ND	ND	ND	15	ND
Indeno{1,2,3–cd}pyrene	C22	2	ND	ND	ND	ND	ND	ND	7.2	4.6	ND	7.9	ND	ND	ND	ND	8.3	ND
TOTAL SEMIVOLATILES		9.7	1.3	0	0	4.5	0	0	3800	7500	6.6	670	0	0	0	26	290	480

ND = not detected

CN = carbon number

TABLE 3-2 con't

PAHS IN SUBSURFACE SOILS (ug/kg)
EPA Method 8310

ANALYTE	CN	SB-3	SB-3	CW-1	CW-1	CW-1	CW-1	CW-2
Interval Sampled		6'-8'	10'-12'	6'-8'	8'-10'	30'-32'	62'-64'	6'-8'
Date Sampled								
Naphthalene	C10	15000	39000	8400	77000	ND	160	2100
Acenaphthylene	C12	ND	1200	ND	ND	ND	ND	ND
1-Methylnaphthalene	C11	3200	16000	2600	15000	ND	82	350
2-Methylnaphthalene	C11	32000	120000	4100	30000	ND	160	820
Acenapthene	C12	12000	39000	8000	40000	ND	300	1700
Fluorene	C13	9400	21000	6700	29000	12	260	1300
Phenanthrene	C14	31000	35000	22000	62000	36	670	6500
Anthracene	C14	13000	11000	27000	63000	57	720	27000
Fluoranthene	C16	16000	12000	9000	28000	21	320	5000
Pyrene	C16	9300	6800	15000	41000	44	490	10000
Benzo{a}anthracene	C18	2700	1400	1400	4700	4.4	53	980
Chrysene	C18	3500	3000	1100	3700	ND	47	1100
Benzo{b}fluoranthene	C20	960	570	490	1600	3.1	20	530
Benzo{k}fluoranthene	C20	510	350	290	980	1.5	11	290
Benzo{a}pyrene	C20	890	440	9.3	97	3.1	21	450
Dibenzo{a,h}anthracene	C22	53	85	20	120	ND	1.6	53
Benzo{g,h,i}perylene	C22	260	190	260	991	ND	11	280
Indeno{1,2,3-cd}pyrene	C22	220	270	49	360	ND	3.6	88
TOTAL SEMIVOLATILES		150000	310000	110000	400000	180	3300	59000

ND = not detected

CN = carbon number

samples were collected from shallow depths (2'-4') however, a greater percentage of the highly condensed PAHs existed (approximately 40-50%). Graphs of the PAH profiles were constructed by plotting each PAH analyte (in increasing complexity) against the reported concentration for each analyte. These graphs were constructed for each soil boring to illustrate the distribution and relative concentrations of PAHs. The graphs are presented in Appendix G.

To compare the distribution of PAHs found in the subsurface soil samples to the hydrocarbon products stored in the former USTs, virgin samples of brushing grade creosote and #2 fuel oil were sent for GC/MS analysis during the Supplemental Investigation. PAH profile graphs were constructed and are included in Appendix H, NAPL Profiles.

As reported in the Supplemental Investigation Report (July 23, 1992), when the profile graphs of the two virgin NAPL samples are compared, the following key observations can be made:

- Acenaphthene, phenanthrene and naphthalene are the PAH analytes present in the highest percentage in brushing grade creosote; anthracene is present in a very low percentage (1-methylnaphthylene and 2-methylnaphthylene were not included in the analysis).
- Anthracene is the PAH analyte present in the highest concentration in #2 fuel oil; acenaphthene is present in a relatively much lower concentration.
- None of the profile graphs showed substantial quantities of complex (C18 - C22) PAH analytes (< approximately 2%).

When compared to the PAH profiles from virgin samples of brushing grade creosote and #2 fuel oil, several general statements can be made about the PAH profiles from the soils collected during the most recent sampling event:

- Soil samples analyzed from 8'-10' below grade at MW-15, MW-16 and MW-17 (downgradient from the presumed source area) are very similar and generally possess phenanthrene, 2-methylnaphthylene, and naphthalene in the highest concentrations. This correlates well with the virgin creosote profile. Similarly, MW-24 immediately upgradient of the former tank pit also correlates well with the virgin product profile.
- PAH profiles from shallow soil samples (2'-4' below grade) at MW-17, MW-18 and MW-19 show a much higher percentage of highly condensed PAHs (approximately 40-50%) than do samples collected from 6'-10' below grade (approximately 4-6%), and do not correlate well with either of the profiles from the virgin products.

As part of the Subsurface Investigation Work Plan prepared for the Osmose site, (June 7, 1990) a baseline risk assessment was performed to determine which transport medias required remediation and to propose risk driven remediation goals for those media. As reported in the Subsurface Investigation Report (June 28, 1991), a very conservative approach was taken when developing acceptable soil concentrations (ASCs) by assuming all PAHs possess the carcinogenic characteristics of benzo(a)pyrene and the non-carcinogenic hazard index for naphthalene. These two PAHs have the most stringent available EPA health criteria (HEAST, 1991). Based upon this conservative approach, an ASC of 473 mg/kg total PAHs was developed for on-site and off-site soils.

Of the soil samples analyzed during this Supplemental Phase II Investigation, only one sample, MW-16 at 7-8 feet below grade, exceed the ASC.

3.3 Hydrogeologic Evaluation

3.3.1 Regional Hydrogeology

A review of hydrogeologic reports of the area determined that the groundwater circulates through a regional flow system in a north, northwest direction from the Appalachian Uplands to the Erie-Ontario Lowlands, where it discharges near Tonawanda Creek. The glacial deposits recharge the soluble limestone bedrock (i.e., Onondaga Limestone) by percolation into joints, fractures and solution channels. The zone of fracturing and solution that follows the upper surface of the soluble limestone rocks has been observed to be in hydraulic continuity with the glacial deposits (LaSala, 1968). Local secondary flow systems exist which discharge to tributary streams.

The transmissivity of the glacial deposits ranges from very low for the lake bed sediments and glacial till to very high (600,000 gallons per day (gpd) per foot) for the outwash sand and gravel deposits. The Onondaga Limestone transmissivity varies greatly depending upon the number of solution channels present. Reported values range from 300 to 25,000 gpd per foot.

3.3.2 Site Hydrogeology

Top-of-casing elevations for the newly installed monitoring wells on site were surveyed on January 5 and March 6, 1993. Elevations were surveyed relative to the arbitrary benchmark that has been used for past site surveys. This allowed the relative groundwater elevation in each monitoring well to be measured in order to construct groundwater contour maps of the shallow and deep portions of the unconsolidated glacial aquifer. Groundwater gauging was performed on December 17, 1992 and March 10, 1993.

The depth to groundwater in the upper portion of the overburden aquifer ranged from 5 to 10 feet below grade on the monitoring date. The shallow groundwater gradient was toward the southeast at approximately 0.6 percent. This is consistent with previous data collected for the site. The shallow groundwater contour map is included as Figure 7.

The depth at which saturated soils were encountered during drilling was generally about two feet deeper than the static water table measured in the wells after equilibration. This indicates the possible existence of confined or partially confined conditions in the upper portion of the aquifer.

Groundwater in the deep portion of the overburden (monitoring wells CW-1, MW-14, MW-18, and MW-19) was encountered at approximately 20 to 30 feet below grade, indicating that a steep vertical gradient exists within this unit. Deep groundwater flow differs significantly in both direction and gradient from shallow groundwater flow. The deep groundwater gradient was toward the west at approximately 1.7 percent. The deep groundwater contour map is included as Figure 8.

3.4 LNAPL and DNAPL Gauging Results

Gauging of all FRE monitoring wells for the presence of LNAPL was performed on December 17, 1992 and March 10, 1993. The three PVC monitoring wells (MW-3, MW-5, and MW-7) were monitored for LNAPL periodically throughout this period. LNAPL was detected in monitoring wells MW-3, MW-7, MW-13, MW-16, and MW-25 at thicknesses ranging from <0.01 feet (MW-16 and MW-25) to 0.15 feet (MW-13). The thickness was not measured in MW-3 or MW-7 because passive LNAPL recovery units (EZY Skimmers) are installed in those wells. The areal extent of LNAPL on site has been estimated and is depicted in Figure 9. During gauging events, whenever LNAPL is detected, it is bailed and stored in DOT approved 55-gallon drums for disposal by Osmose.

The response of the electronic liquid-level gauging instrument on the December 18, 1992 gauging date indicated the possible presence of LNAPL in MW-18. This was not confirmed visually, however, and no evidence of LNAPL was detected during two subsequent gauging events (January 21, 1993 and February 18, 1993). The original report of the presence of LNAPL in MW-18 is therefore not considered to be accurate.

FIGURE 7

SHALLOW GROUNDWATER CONTOUR MAP

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	1/21/92	GWDEC92

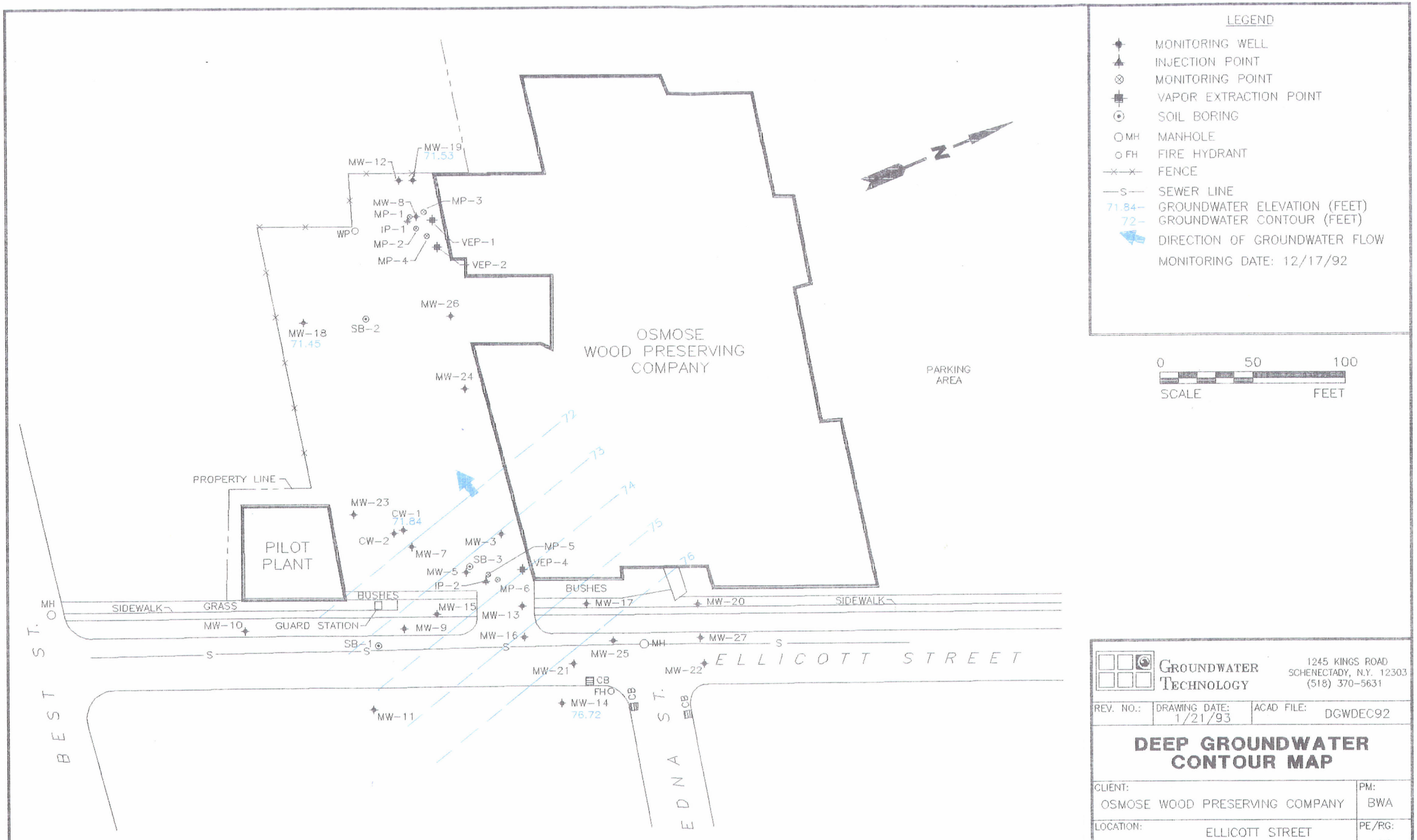
SHALLOW GROUNDWATER CONTOUR MAP

CLIENT:	PM:
OSMOSE WOOD PRESERVING COMPANY	BWA
LOCATION: ELLICOTT STREET BUFFALO, NEW YORK	GEO: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	TRS/MET	01110-5307	7

Figure 8

Deep Groundwater Contour Map



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REV. NO.:	DRAWING DATE:	ACAD FILE:
	1/21/93	DGWDEC92

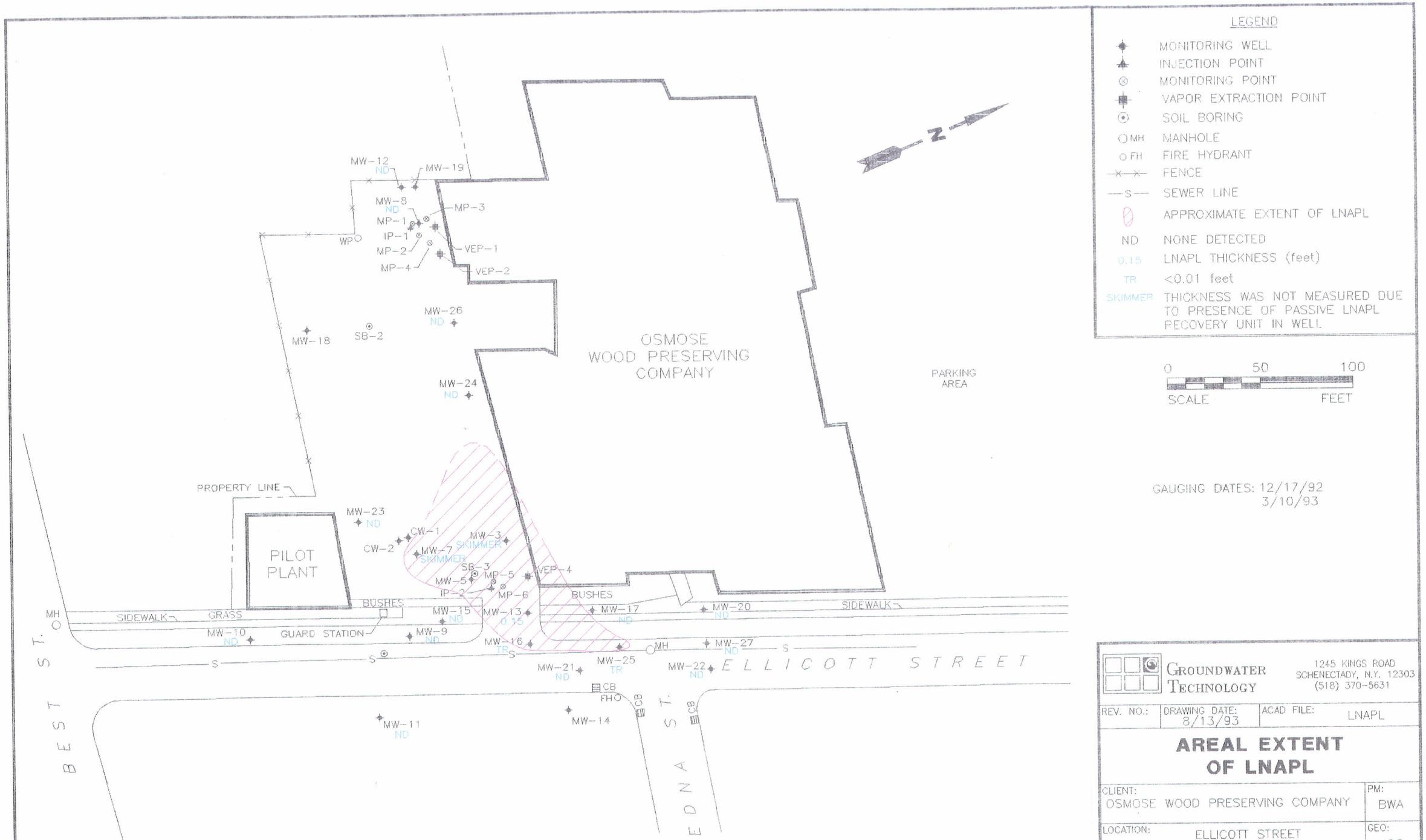
DEEP GROUNDWATER CONTOUR MAP

CLIENT:	PM:
OSMOSE WOOD PRESERVING COMPANY	BWA
LOCATION: ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	TRS	01110-5307	8

FIGURE 9

AREAL EXTENT OF LNAPL



GAUGING DATES: 12/17/92
3/10/93

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SCHENECTADY, N.Y. 12303
(518) 370-5631

REV. NO.:	DRAWING DATE:	ACAD FILE:
	8/13/93	LNAPL

AREAL EXTENT OF LNAPL

CLIENT:	PM:
OSMOSE WOOD PRESERVING COMPANY	BWA
LOCATION: ELLICOTT STREET, BUFFALO, NEW YORK	GEO: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	MET/DEO	01110-5307	9

No LNAPL was detected in monitoring wells MW-24 or MW-26 (along the southern edge of the Osmose building west of MW-3), in MW-23 (south of the former tank pit), in MW-15 (south of the entrance gate), in MW-17 or MW-20 (along the east side of the Osmose building), in MW-21 or MW-22 (east of the sewer line), or in MW-27 (next to the sewer line).

No DNAPL was detected in any of the shallow or deep FRE monitoring wells on site during the gauging events.

3.5 Shallow Groundwater Sampling Results

Groundwater samples were collected from all 13 shallow groundwater FRE monitoring wells on site which did not contain LNAPL. Analysis was performed for Aromatic Volatile Organics by Modified EPA Method 8020, and for Polynuclear Aromatic Hydrocarbons by EPA Method 8310. Field measurements were made of the turbidity of the groundwater after each well was purged. Conductivity, pH and temperature measurements were also collected in the field.

3.5.1 Volatile Compounds

BTEX compounds were detected in 4 of the 13 shallow wells sampled. Dissolved BTEX was detected at MW-17 (1,500 μg/l), MW-15 (890 μg/l), MW-9 (560 μg/l), and MW-24 (240 μg/l). The only chlorinated compound detected in the shallow groundwater on site was 1,2-dichlorobenzene, which was detected at MW-17 (720 μg/l), MW-15 (440 μg/l), and MW-9 (15 μg/l). Groundwater samples were not collected from MW-13 or MW-16 due to the presence of LNAPL.

No volatile compounds were detected in groundwater samples from monitoring wells MW-8 or MW-12 (along the western edge of the Osmose property), from MW-10 or MW-23 (along the southern edge of the Osmose property), from MW-11, MW-21, or MW-22 (east of the sewer line), from MW-20 (along the eastern edge of the Osmose building), or from MW-26 (along the southern edge of the Osmose building).

In groundwater samples where VOCs were present, xylenes comprised an average of approximately 45% of the total VOC loading. 1,2-dichlorobenzene comprised approximately 17%, while benzene and toluene comprised approximately 16% each of the total VOCs. The predominance of xylene correlates well with the soils data collected (Section 3.2.1). The presence of these xylenes are assumed to be associated with the storage of #2 fuel oil in the former underground storage tanks.

The groundwater sampling results are summarized below in Table 3-3, and the complete laboratory analytical report is included in Appendix F. A shallow groundwater dissolved volatiles distribution map is included as Figure 10.

3.5.2 Semi-volatile Compounds

Dissolved PAHs were detected in 10 of the 13 shallow wells sampled. As mentioned above, groundwater samples were not collected from MW-13 or MW-16 due to the presence of liquid-phase hydrocarbons. The highest levels of dissolved PAHs were detected at MW-17 (13,000 μg/l) and MW-24 (1,100 μg/l). Substantially lower levels were detected at eight well locations, ranging from 3.5 μg/l to 0.063 μg/l. The laboratory data for the most recent sampling rounds are summarized below in Table 3-4, PAHs in Shallow Groundwater. The complete laboratory analytical reports are included in Appendix F.

As in previous sampling rounds, the more complex PAHs (C18 - C22) were more pervasive in the groundwater, but the less complex compounds (C10 - C16) were present in much higher concentrations. Naphthalene and methylnaphthalene accounted for approximately 95 percent of the total PAHs detected in the shallow groundwater on site.

No dissolved PAHs were detected in groundwater samples from monitoring well MW-9 (south of the entrance gate), from MW-20 (along the eastern edge of the Osmose building), or from MW-22 (near the intersection of Edna Place and Ellicott Street east of the sewer line). The low levels of dissolved PAHs found in upgradient well MW-12 (0.80 μg/l) and off-site downgradient well MW-11 (0.32 μg/l) are not considered to be associated with the Osmose site.

A shallow groundwater dissolved PAH distribution map is included as Figure 11.

3.5.3 Turbidity, Conductivity, Temperature, pH

Field measurements were made of each groundwater sample for turbidity, pH, conductivity, and temperature during the sampling event. All measurements were within normal parameters. The field measurements are summarized below in Table 3-5, Shallow Groundwater Field Measurements. As can be seen in the table, turbidity values were greater than 50 NTU for several of the samples. The contract laboratory was consulted and verified that high turbidity would not interfere with the analyses to be performed.

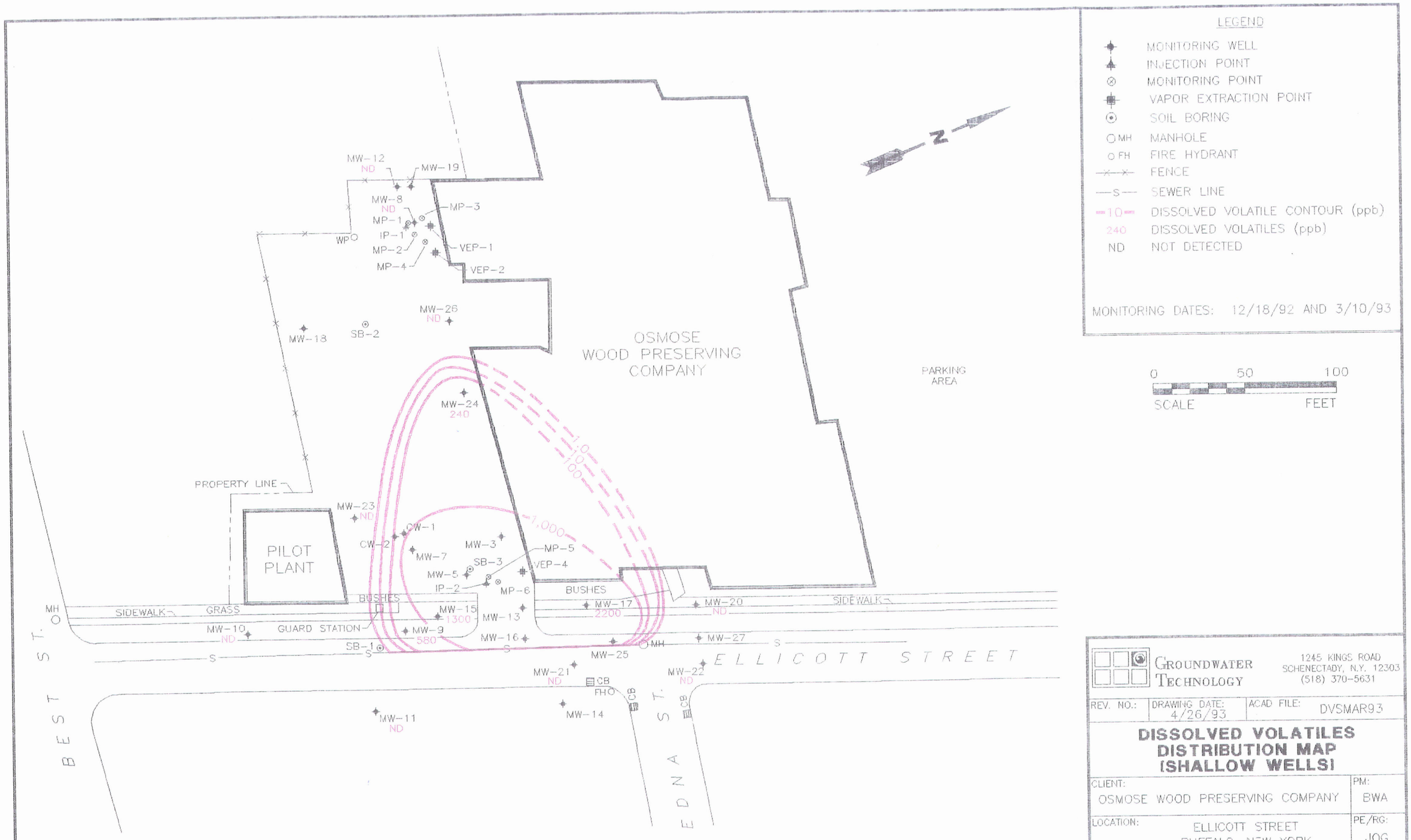
TABLE 3-3
VOCs in Shallow Groundwater (μg/l)
EPA Method 8020

ANALYTE	MW-8	MW-9	MW-10	MW-11	MW-12	MW-15	MW-17	MW-20	MW-21	MW-22	MW-23	MW-24	MW-26	FIELD BLANK	TRIP BLANK
Date Sampled	12/18/92	12/18/92	12/18/92	12/18/92	12/18/92	12/18/92	12/18/92	12/18/92	12/18/92	3/10/93	3/10/93	3/10/93	3/10/93	12/18/92	12/18/92
Benzene	ND	230	ND	ND	ND	110	190	ND	ND	ND	ND	13	ND	ND	ND
Toluene	ND	150	ND	ND	ND	210	330	ND	ND	ND	ND	15	ND	ND	ND
Ethyl Benzene	ND	31	ND	ND	ND	40	65	ND	ND	ND	ND	38	ND	ND	ND
Xylenes (total)	ND	150	ND	ND	ND	530	930	ND	ND	ND	ND	170	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	15	ND	ND	ND	440	720	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Volatiles	ND	580	ND	ND	ND	1,300	2,200	ND	ND	ND	ND	240	ND	ND	ND

KEY

μg/l = micrograms per liter
ND = not detected

FIGURE 10
DISSOLVED VOLATILES DISTRIBUTION MAP
(SHALLOW WELLS)



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	4/26/93	DVSMAR93

DISSOLVED VOLATILES DISTRIBUTION MAP (SHALLOW WELLS)

CLIENT:	PM:
OSMOSE WOOD PRESERVING COMPANY	BWA
LOCATION: ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	DEO	01110-5307	10

TABLE 3–4
PAHS IN SHALLOW GROUNDWATER (ug/l)
EPA Method 8310

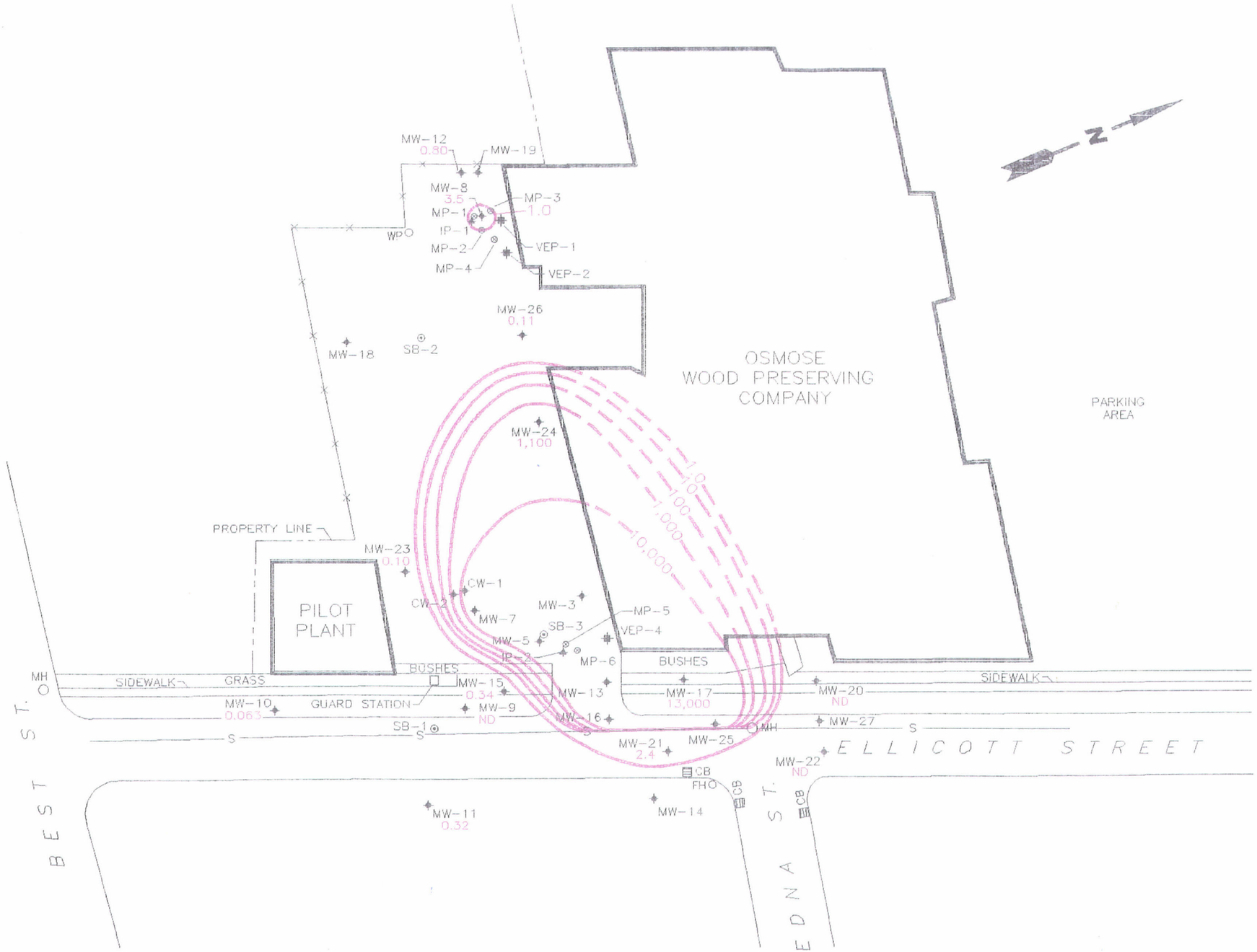
ANALYTE	CN	MW–8	MW–9	MW–10	MW–11	MW–12	MW–15	MW–17	MW–20	MW–21	MW–22	MW–23	MW–24	MW–26	FIELD BLANK
Date Sampled		12/18/92	12/18/92	12/18/92	12/18/92	12/18/92	12/18/92	12/18/92	12/18/92	12/18/92	3/10/93	3/10/93	3/10/93	3/10/93	12/18/92
Naphthalene	C10	ND	ND	ND	ND	ND	ND	11,000	ND	ND	ND	ND	660	ND	ND
Acenaphthylene	C12	ND	ND	ND	ND	ND	ND	260	ND	ND	ND	ND	2.8	ND	ND
1–Methylnaphthalene	C11	ND	ND	ND	ND	ND	ND	290	ND	ND	ND	ND	160	ND	ND
2–Methylnaphthalene	C11	ND	ND	ND	ND	ND	ND	1,100	ND	2.4	ND	ND	170	ND	ND
Acenaphthene	C12	ND	ND	ND	ND	ND	ND	330	ND	ND	ND	ND	35	ND	ND
Fluorene	C13	ND	ND	ND	ND	ND	0.22	130	ND	ND	ND	ND	18	ND	ND
Phenanthrene	C14	ND	ND	ND	ND	ND	ND	110	ND	ND	ND	ND	28	ND	ND
Anthracene	C14	ND	ND	ND	ND	ND	ND	30	ND	ND	ND	ND	5.3	ND	ND
Fluoranthene	C16	1.2	ND	ND	ND	0.37	ND	10	ND	ND	ND	ND	5.6	ND	ND
Pyrene	C16	ND	ND	ND	ND	ND	ND	5.9	ND	ND	ND	ND	0.95	ND	ND
Benzo{a}anthracene	C18	0.21	ND	0.016	0.056	0.070	0.032	0.75	ND	ND	ND	0.023	1.0	0.024	ND
Chrysene	C18	0.48	ND	ND	ND	ND	ND	0.89	ND	ND	ND	ND	1.5	ND	ND
Benzo{b}fluoranthene	C20	0.47	ND	0.021	0.087	0.12	0.033	0.23	ND	0.021	ND	0.037	1.1	0.044	ND
Benzo{k}fluoranthene	C20	0.20	ND	ND	0.038	0.056	0.019	0.14	ND	ND	ND	0.018	0.50	0.018	ND
Benzo{a}pyrene	C20	0.31	ND	0.026	0.081	0.089	0.033	0.22	ND	ND	ND	0.027	1.0	0.028	ND
Dibenzo{a,h}anthracene	C22	0.059	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND
Benzo{g,h,i}perylene	C22	0.20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.55	ND	ND
Indeno{1,2,3–cd}pyrene	C22	0.33	ND	ND	0.060	0.10	ND	0.073	ND	ND	ND	ND	1.1	ND	ND
TOTAL SEMIVOLATILES		3.5	ND	0.063	0.32	0.80	0.34	13,000	ND	2.4	ND	0.10	1,100	0.11	ND

ND = not detected

CN = carbon number

FIGURE 11

DISSOLVED PAHS DISTRIBUTION MAP (SHALLOW WELLS)



LEGEND

- MONITORING WELL
- INJECTION POINT
- MONITORING POINT
- VAPOR EXTRACTION POINT
- SOIL BORING
- MH MANHOLE
- FH FIRE HYDRANT
- FENCE
- S SEWER LINE
- 10 DISSOLVED PAH CONTOUR (ppb)
- 220 DISSOLVED PAH (ppb)
- ND NOT DETECTED

MONITORING DATES: 2/18/93 AND 3/10/93

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REV. NO.:	DRAWING DATE:	ACAD FILE:
	4/26/93	DPSMAR93

DISSOLVED PAH DISTRIBUTION MAP (SHALLOW WELLS)

CLIENT:	PM:
OSMOSE WOOD PRESERVING COMPANY	BWA
LOCATION: ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	DEO	01110-5307	11

TABLE 3-5
Shallow Groundwater Field Measurements

Well ID	Date Sampled	Turbidity (NTUs)	Conductivity (μS)	pH (pH units)	Temperature (degrees C)
MW-8	12/18/92	49.90	750	7.42	14.0
MW-9	12/18/92	15.21	1400	7.40	13.5
MW-10	12/18/92	11.90	1050	7.41	14.2
MW-11	12/18/92	21.70	790	7.82	12.5
MW-12	12/18/92	44.60	900	7.40	13.5
MW-15	12/18/92	60.50	1300	7.47	13.5
MW-17	12/18/92	119.00	1900	7.41	15.0
MW-20	12/18/92	38.40	1050	7.76	13.5
MW-21	12/18/92	95.30	2150	7.49	15.0
MW-22	3/10/93	0.03	3790	7.28	9.2
MW-23	3/10/93	1.79	3380	7.45	10.3
MW-24	3/10/93	0.68	1690	8.06	10.6
MW-26	3/10/93	0.94	1610	8.23	8.9

Conductivity readings were generally lower than in past sampling events (Supplemental Investigation Report, July 23, 1992) and temperature readings were about 9-12°C higher. Seasonal fluctuations may contribute to these variations.

3.6 Deep Groundwater Sampling Results

Two rounds of groundwater samples were collected from the deep wells on site during this phase of the investigation. Three of the four deep wells were sampled in December, 1992 (CW-1, MW-14 and MW-19). At that time, monitoring well MW-18 was not sampled because a sheen was detected with an electronic interface probe in the well after development. The sheen was not confirmed visually with an acrylic bailer. As a result of the apparent sheen in MW-18 and the anomalously high levels of dissolved compounds that were detected during that sampling event in monitoring well MW-14, another deep groundwater sampling event was performed in February, 1993. At that time no sheens were observed and all four deep wells were sampled. The results of the February sampling round are more consistent with past groundwater data and soils data collected at depth, and therefore those results have been used for discussion in this report. The results of the first round are included in the tables for reference.

Analysis was performed for Aromatic Volatile Organics by Modified EPA Method 8020, and for Polynuclear Aromatic Hydrocarbons by EPA Method 8310. Field measurements were made of the turbidity, conductivity, pH and temperature of the groundwater after each well was purged.

3.6.1 Volatile Compounds

BTEX compounds were detected in 2 of the 4 deep wells sampled. Dissolved BTEX was detected at cluster well CW-1 (15 μg/l) and MW-18 (0.3 μg/l). No dissolved BTEX compounds were detected in the deep groundwater at monitoring wells MW-14 (upgradient and east of Ellicott Street) or MW-19 (along the western, downgradient, edge of the Osmose property). Benzene was the most predominant VOC identified in the deep groundwater and comprised approximately 65% of the total dissolved volatiles. Xylenes were present in the groundwater at cluster well CW-1 (3.5 - 3.9 μg/L) but were not detected in any of the other deep wells. This is markedly different from the shallow groundwater quality data (Section 3.5.1) which showed that xylenes were the predominant analytes (approximately 45% of total VOC loading) and benzene only 16%.

The only chlorinated compound detected in the deep groundwater on site was 1,2-dichlorobenzene, which was detected at cluster well CW-1 (3.9 μg/l). The groundwater sampling results are summarized below in Table 3-6, and the complete laboratory analytical report is included in Appendix F. A deep groundwater dissolved volatiles distribution map is included as Figure 12.

TABLE 3-6
VOCs in Deep Groundwater (μg/l)
EPA Method 8020

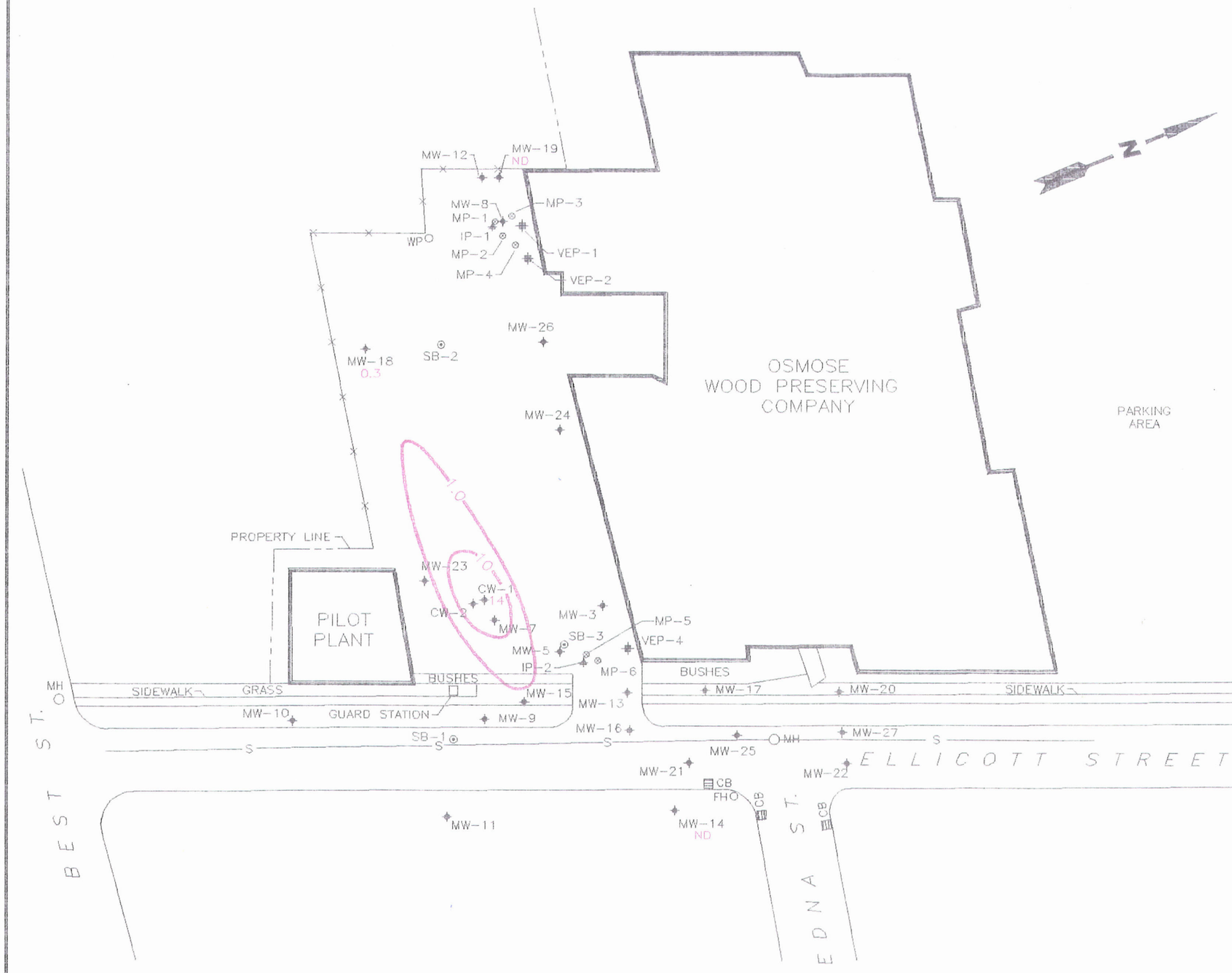
ANALYTE	CW-1	CW-1	MW-14	MW-14	MW-18	MW-19	MW-19
Date Sampled	12/18/92	2/18/93	12/18/92	2/18/93	2/18/93	12/18/92	2/18/93
Benzene	9.8	8.3	ND	ND	0.3	0.6	ND
Toluene	1.4	1.4	ND	ND	ND	0.9	ND
Ethyl Benzene	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	3.5	3.9	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	3.9	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
1,4-dichlorobenzene	ND	ND	ND	ND	ND	ND	ND
Total Volatiles	19	14	ND	ND	0.3	1.5	ND

KEY

μg/l = micrograms per liter
ND = not detected

FIGURE 12

DISSOLVED VOLATILES DISTRIBUTION MAP (DEEP WELLS)



LEGEND

- MONITORING WELL
- INJECTION POINT
- MONITORING POINT
- VAPOR EXTRACTION POINT
- SOIL BORING
- MH MANHOLE
- FH FIRE HYDRANT
- FENCE
- S SEWER LINE
- 10 DISSOLVED VOLATILE CONTOUR (ppb)
- 240 DISSOLVED VOLATILES (ppb)
- ND NOT DETECTED

MONITORING DATES: 2/18/93

0 50 100
SCALE FEET

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DISSOLVED VOLATILES DISTRIBUTION MAP (DEEP WELLS)

CLIENT:	PM:
OSMOSE WOOD PRESERVING COMPANY	BWA
LOCATION: ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	DEO	01110-5307	12

3.6.2 Semi-volatile Compounds

PAH compounds were detected in 2 of the 4 deep wells sampled. Dissolved PAHs were detected at cluster well CW-1 (220 μg/l) and at MW-18 (1.1 μg/l). No dissolved PAHs were detected in the deep groundwater at monitoring wells MW-14 (east of Ellicott Street) or MW-19 (along the western edge of the Osmose property). The PAHs at MW-18 were dominated by the more complex compounds (C18 - C22), while the PAHs at CW-1 were dominated by the less complex compounds (95% of total VOCs detected are in the C10 - C13 range). Naphthalene and 2-methylnaphthalene were present in the highest concentrations at CW-1. This distribution correlates well when compared with the soil data.

The PAH sampling results are summarized below in Table 3-7. The complete laboratory analytical reports are included in Appendix F. A deep groundwater PAH distribution map is included as Figure 13.

TABLE 3–7
PAHS IN DEEP GROUNDWATER (ug/l)
EPA Method 8310

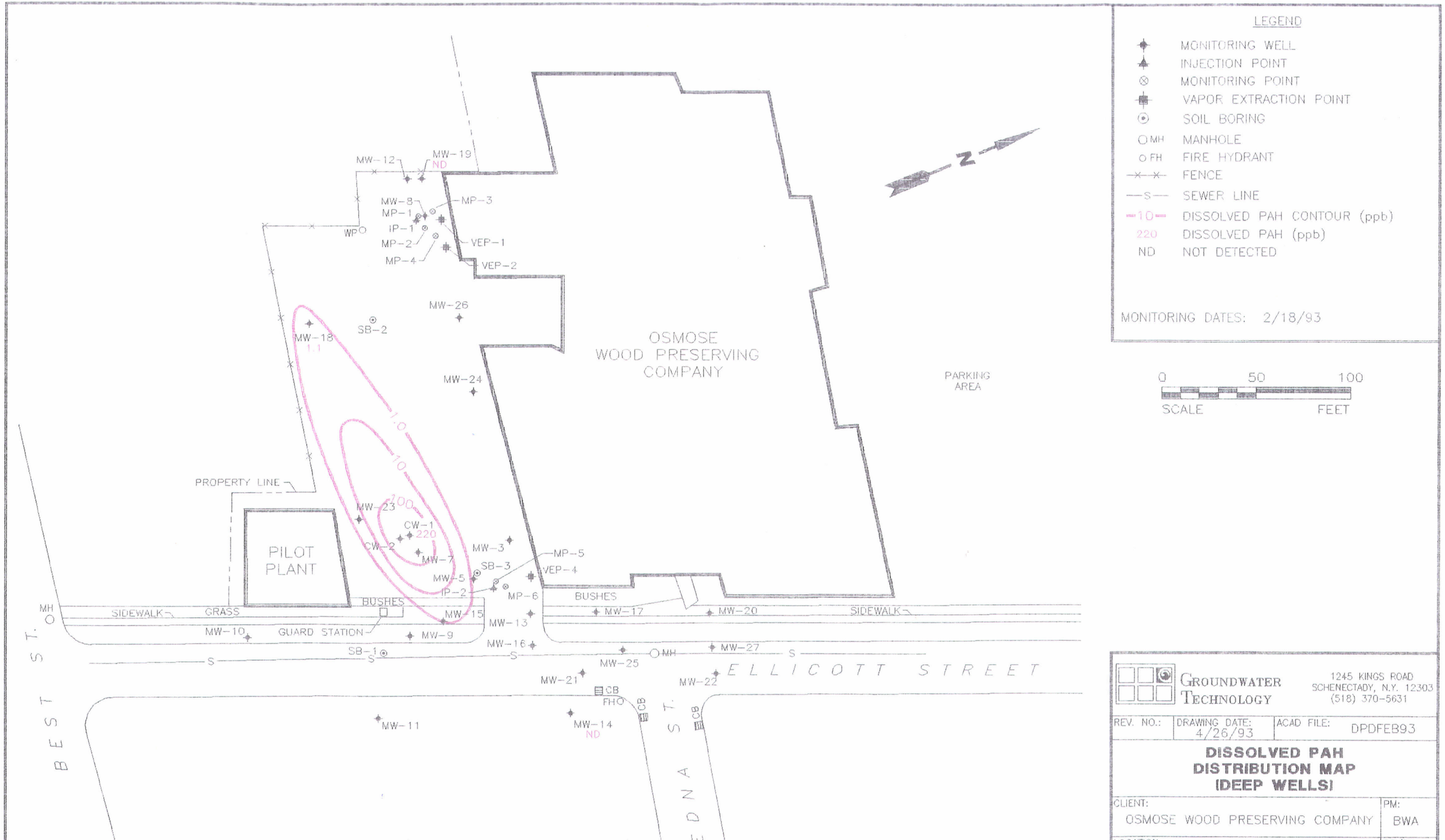
ANALYTE	CN	CW–1	MW–14	MW–19	FIELD BLANK	CW–1	MW–14	MW–18	MW–19
Date Sampled		12/18/92	12/18/92	12/18/92	12/18/92	2/18/93	2/18/93	2/18/93	2/18/93
Naphthalene	C10	89	4200	ND	ND	88	ND	ND	ND
Acenaphthylene	C12	ND	110	ND	ND	ND	ND	ND	ND
1–Methylnaphthalene	C11	ND	170	ND	ND	18	ND	ND	ND
2–Methylnaphthalene	C11	46	660	ND	ND	69	ND	ND	ND
Acenaphthene	C12	ND	240	ND	ND	27	ND	ND	ND
Fluorene	C13	6.3	91	ND	ND	8.0	ND	ND	ND
Phenanthrene	C14	ND	66	ND	ND	4.0	ND	ND	ND
Anthracene	C14	ND	13	ND	ND	ND	ND	ND	ND
Fluoranthene	C16	25	7.1	0.34	ND	0.92	ND	0.53	ND
Pyrene	C16	14	3.0	ND	ND	0.34	ND	ND	ND
Benzo{a}anthracene	C18	5.9	0.46	0.043	ND	0.21	ND	0.073	ND
Chrysene	C18	11	0.48	ND	ND	0.30	ND	ND	ND
Benzo{b}fluoranthene	C20	11	0.23	0.079	ND	0.34	ND	0.15	ND
Benzo{k}fluoranthene	C20	4.7	0.11	0.039	ND	0.14	ND	0.068	ND
Benzo{a}pyrene	C20	8.2	0.21	0.057	ND	0.25	ND	0.10	ND
Dibenzo{a,h}anthracene	C22	0.72	ND	ND	ND	0.030	ND	ND	ND
Benzo{g,h,i}perylene	C22	6.2	ND	ND	ND	0.20	ND	0.096	ND
Indeno{1,2,3–cd}pyrene	C22	8.8	0.092	0.060	ND	0.25	ND	0.12	ND
TOTAL SEMIVOLATILES		240	5600	0.62	ND	220	ND	1.1	ND

ND = not detected

CN = carbon number

FIGURE 13

DISSOLVED PAH DISTRIBUTION MAP (DEEP WELLS)



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DISSOLVED PAH DISTRIBUTION MAP (DEEP WELLS)

CLIENT:	PM:
OSMOSE WOOD PRESERVING COMPANY	BWA
LOCATION: ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	DEO	01110-5307	13

3.6.3 Turbidity, Conductivity, Temperature, pH

Field measurements were made of each groundwater sample for turbidity, pH, conductivity, and temperature during the sampling event. All measurements were within normal parameters. The field measurements are summarized below in Table 3-8. As can be seen in the table, turbidity values were less than 50 NTU for all deep groundwater samples collected on the February 18, 1993 sampling date.

TABLE 3-8
Deep Groundwater Field Measurements

Well ID	Date Sampled	Turbidity (NTUs)	Conductivity (μS)	pH (pH units)	Temperature (degrees C)
CW-1	12/18/92	58.80	1000	7.92	13.0
CW-1	2/18/93	25.80	1900	9.20	4.2*
MW-14	12/18/92	>200	-	8.75	-
MW-14	2/18/93	43.00	1420	9.77	3.9*
MW-18	2/18/93	0.79	2050	8.83	4.7*
MW-19	12/18/92	109.20	1050	7.40	13.8
MW-19	2/18/93	6.84	2410	8.30	3.6*

* The accuracy of these readings is suspect due to the effect of very cold ambient temperatures on the sampling date.

The conductivity of the groundwater samples collected from well MW-14 correlates well with historical data collected on April 2, 1992 during the Supplemental Investigation (Supplemental Investigation Report, July 23, 1992). At cluster well CW-1, however, the conductivity appears to be lower than historical data. Conductivity of the deep groundwater appears to be similar to the measured conductivity of the shallow groundwater; no definitive trends exist.

When compared to the shallow groundwater conductivity data, no definitive trends are apparent with the exception of pH values. The average pH of the deep groundwater was 9.03, while the average pH of the shallow groundwater was 7.48.

3.7 Surface Soil Sampling Results

Surface soil grab samples were collected on June 29, 1993 from six locations south and west of the Osmose parking lot (Figure 3, Soil Grab Sample Locations). The surface grab samples were sent to the contract laboratory for analysis by EPA Method 8310. The results are summarized below in Table 3-9. The complete laboratory analytical report is included in Appendix F.

PAH compounds were detected at all six locations, at concentrations ranging from 2,887 μg/kg to 31,240 μg/kg. Noticeably absent from all six sampling locations are naphthalene, anthracene and 2-methylnaphthalene. These analytes are present in all subsurface soil samples where PAHs were detected with the exception of soil samples collected from shallow intervals (2-4 feet below grade).

Fluoranthene was present in the highest concentrations at all six surface sample locations. Fluoranthene comprised approximately 19% of the total PAHs detected. Pyrene, benzo[a]anthracene, chrysene, benzo[b]fluoranthene, and benzo[a]pyrene each comprised approximately 8-10% of the PAHs detected.

Table 3-10, Distribution of PAHs in Surface Soils, shows the percentage of low - , medium -, and high-complexity PAHs in the surface grab samples. The highly condensed PAHs (C18-C22) comprised approximately 59% of the total PAH loading at each location. Medium complexity PAHs (C14-C16) comprised approximately 38% of the loading, and the low complexity PAHs (C10-C13) comprised approximately 3% of the total. This distribution of PAH analytes correlates very well with the three surface samples collected previously from the NFTA property.

TABLE 3-9

SURFACE SOIL SAMPLING RESULTS (μg/kg)

	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9
Sampling Date	3/18/92	3/18/92	3/18/92	6/29/93	6/29/93	6/29/93	6/29/93	6/29/93	6/29/93
Naphthalene	ND	5700	10000	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	ND	6900	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	120	4300	8000	1400	160	180	410	ND	330
Phenanthrene	440	20000	29000	5200	760	ND	1600	ND	1300
Anthracene	940	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	1200	30000	50000	5600	1400	760	2300	570	1800
Pyrene	ND	ND	ND	3600	860	240	1500	270	1300
Benzo{a}anthracene	430	11000	17000	2400	580	350	1100	260	860
Chrysene	200	5100	8300	2500	820	490	1200	340	1000
Benzo{b}fluoranthene	520	9700	14000	2000	640	400	1000	290	850
Benzo{k}fluoranthene	300	5800	8500	990	270	170	470	130	380
Benzo{a}pyrene	670	12000	17000	2100	620	400	1000	270	850
Dibenzo{a,h}anthracene	79	1500	2200	450	83	99	250	67	23
Benzo{g,h,i}perylene	400	5900	8500	2200	590	420	100	290	860
Indeno{1,2,3-cd}pyrene	280	4900	6400	2800	910	610	1400	430	1200
TOTAL PAHS	5,600	123,000	179,000	31,000	7,700	8,100	12,000	2,900	11,000

KEY

ND = not detected

TABLE 3-10

DISTRIBUTION OF PAHs IN SURFACE SAMPLES

CARBON #	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	AVERAGE
C10 - C13	4%	2%	4%	3%	0%	3%	2.7
C14 - C16	47%	39%	24%	45%	29%	41%	37.5
C18 - C22	49%	60%	71%	54%	72%	57%	58.2

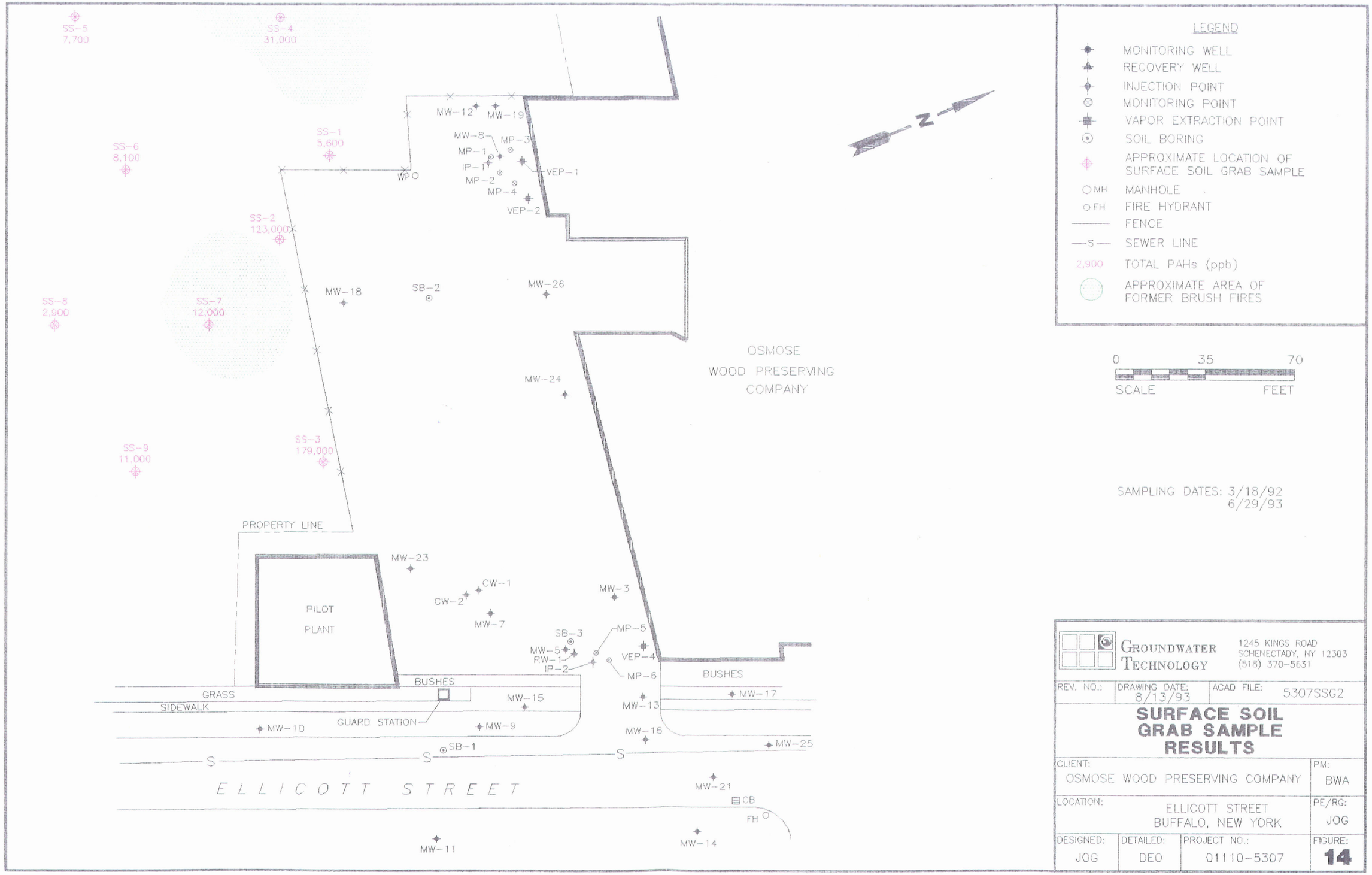
PAH profiles were constructed for the surface grab samples and are included in Appendix I. When compared to the NAPL fingerprint graphs, the dissimilarities are evident.

PAHs are introduced into the environment via natural and anthropogenic combustion processes. As reported in the Subsurface Investigation Report (July 23, 1993) the elevated PAHs found in the surface soil grab samples were believed to be the result of two brush fires which occurred in 1991 in the area where the surface soils were collected. The report also indicated that both fires were reported to the Buffalo Fire Department. "The primary source of many PAHs....is the incomplete combustion of wood and fire....as such, PAHs are ubiquitous products of combustion from common sources such as motor vehicles...., wood burning stoves....,natural sources include....forest fires." (Toxicological Profile for Polycyclic Aromatic Hydrocarbons, US Public Health Services Agency for Toxic Substances and Disease Registry, October, 1989, pp 125-127). PAHs in the fields could have also been produced if a building off site had burned down and soot was carried onto the site.

A map depicting the approximate locations of the bush fires was presented in Appendix H of the Supplemental Investigation Report. This map has been reproduced and presented as Figure 14. Included on the figure are the locations and results of the most recent surface soil sampling event. The figure shows that the two grab samples with the highest PAH levels (SS-4 and SS-7) are located within the previously identified areas of brush fires. The PAH levels decrease as distance from the burn areas increases.

Figure 14

Surface Soil Grab Sample Results



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SCHENECTADY, NY 12303
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REV. NO.:	DRAWING DATE: 8/13/93	ACAD FILE: 5307SSG2

SURFACE SOIL GRAB SAMPLE RESULTS

CLIENT:		PM:
OSMOSE WOOD PRESERVING COMPANY		BWA
LOCATION:	ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG
DESIGNED: JOG	DETAILED: DEO	PROJECT NO.: 01110-5307
		FIGURE: 14

Anthropogenic activities have dramatically increased the quantity of PAHs in the environment, with the majority emitted from fossil fuel combustion sources such as automobiles, asphalt production, and manufacturing facilities. Of primary concern is the subgroup of PAH compounds considered to be possible or probable human carcinogens (benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, dibenzo[a,h]anthracene, and indeno[1,2,3-c,d]pyrene). As anticipated, metropolitan and industrial areas have higher soil concentrations of carcinogenic PAHs because of the proximity of urban areas to sources of fossil fuel combustion. "The majority of urban soil concentrations (of carcinogenic PAHs) fall in the 600-3000 μg/kg range. Higher values near areas of heavy transportation or industrialization are probable[1]. The highest ambient concentrations of carcinogenic PAHs in soils have been reported for road dust, which can contain levels of 8,000-336,000 μg/kg"[1].

There are several observations that can be made from the above data that indicate that the source of PAHs was brush fires or anthropogenic sources. First, there is a predominance of high-complexity (multi-ring) compounds. These highly condensed compounds are common soot constituents, resulting from a carbonization reaction. Second, these highly condensed compounds are not predominant in the soils which were staged as part of the IRM. Third, the NAPL indicator analytes (acenaphthene and anthracene) were not present in any of the surface samples.

The PAH profiles of the surface grab samples are, however, very similar to the profiles from soil samples collected from 2 - 4 feet below grade at locations MW-8, MW-18, and MW-19.

3.8 Municipal Sewer System Sampling Results

Water samples were collected from the municipal sewer system at two locations, one at the intersection of Best and Ellicott Streets upstream from the Osmose facility (SP#1), and one at the intersection of Ellicott Street and Edna Place in front of the Osmose facility (SP#2), on January 5, 1993. The overall PAH concentration in the sewer water increased from a total of 20 μg/l in the "background" sample to a total of 1400 μg/l in front of the Osmose facility. The results are summarized in Table 3-11, and the complete laboratory analytical report is included in Appendix F. As anticipated, the lower complexity PAHs were present in higher concentrations than the more complex PAHs. This is attributed to their higher solubilities and lower Koc values. Based upon inconsistencies inherent in collecting grab samples

[1] Menzie, Potocki, and Santodonato. Exposure to Carcinogenic PAHs in the Environment, Environmental Science & Technology, Vol. 26, 1992.

from combined sewer lines and the limited data available, it is not apparent that the increase in dissolved PAH concentrations is statistically significant.

TABLE 3-11
Municipal Sewer Sampling Results (μg/l)
EPA Method 8310

	SP#1	SP#2
SAMPLING DATA	**1/05/93**	**1/05/93**
Naphthalene	ND	370
Acenaphthylene	13	7.8
1-Methylnaphthalene	ND	50
2-Methylnaphthalene	ND	330
Acenaphthene	ND	120
Fluorene	2.5	93
Phenanthrene	2.1	230
Anthracene	ND	55
Fluoranthene	1.1	86
Pyrene	0.45	64
Benzo{a}anthracene	0.11	12
Chrysene	0.32	17
Benzo{b}fluoranthene	0.19	4.6
Benzo{k}fluoranthene	0.086	2.2
Benzo{a}pyrene	0.11	4.4
Dibenzo{a,h}anthracene	ND	0.47
Benzo{g,h,i}perylene	0.098	1.5
Indeno{1,2,3-cd}pyrene	0.085	1.8
TOTAL PAHS	20	1,400

KEY

ND = not detected

For comparison purposes, on April 8, 1993 the BSA was contacted to determine what dissolved PAH levels would be acceptable from a permitted discharge. The BSA indicated that the results of an EPA Method 624 (purgeable volatiles) or EPA Method 625 (Semi-volatile organics) could not exceed 4.26 mg/l. Based upon this information, it is not believed that the increase in dissolved PAHs cause an imminent danger to the BSA treatment system.

3.9 QA/QC Sampling Results

Trip blanks, field blanks, equipment blanks, and blind duplicate samples were collected during the Phase II Investigation, as summarized in Table 2-3. No target analytes were detected in any of the blank samples. Analysis of the blind duplicate soil sample collected yielded results that were consistent with the original sample, as shown in Table 3-1. The laboratory analytical reports for the blanks and the blind duplicate are included in Appendix F, and a complete discussion of the QA/QC sampling results can be found in the Data Validation Report (Appendix E).

3.10 Data Validation Results

The data collected during the field investigation was submitted to Ms. Andrea Schuessler of ChemWorld Environmental, Inc., for QA/QC review. The data validation review found that the data collected during the Phase II Investigation conformed to the DQOs, as outlined in the Work Plan and subsequent documents, in terms of:

- completeness,
- correctness,
- accuracy,
- precision, and
- representativeness.

The Data Validation Report is included in Appendix E.

4.0 SUMMARY DISCUSSION

The purpose of the following sections are to present a brief summary discussion of the results of the Supplemental (Phase II) Investigation. Specific objectives of the Phase II investigation were to:

- quantify the adsorbed hydrocarbons in soils..
- delineate the extent of LNAPL.
- investigate the shallow groundwater quality.
- investigate the deep groundwater quality along the western and southern boundaries of the site.
- verify the direction of deep groundwater flow beneath the Osmose facility.
- determine the presence, or absence of DNAPL.
- determine if an increase in PAH concentrations in surface soils on adjoining properties exists due to Osmose activities.
- determine if any releases on the Osmose site are impacting the sewer line which runs beneath Ellicott Street.

4.1 Hydrocarbon Mass Estimate

A hydrocarbon mass calculation was performed utilizing all historic data collected to date for the Osmose facility. The following conclusions emerged from this estimate:

- Between 550 and 900 gallons (about 4,400 to 7,200 pounds) of hydrocarbons remain in the subsurface beneath the Osmose facility (NAPL, volatile and semi-volatile adsorbed compounds and dissolved compounds).
- The hydrocarbon mass is primarily the liquid-phase portion (about 55 percent of the total).

- Adsorbed-phase hydrocarbons comprise about 44 percent of the total. Adsorbed-phase hydrocarbons in the saturated zone account for approximately 38 percent of the total, while adsorbed-phase hydrocarbons in the unsaturated zone account for around 6 percent.

- Dissolved-phase hydrocarbons comprise a negligible mass (less than one percent of the total).

- Volatile compounds comprise less than 1 percent of the total hydrocarbons on site.

- Approximately 95 percent of the total hydrocarbon mass is accounted for by PAH compounds located between 6 and 12 feet below grade in the entrance gate area (Figure 9, Figure 15).

The distribution of hydrocarbon compounds between each phase is shown in a bar chart included in Appendix J. This mass calculation is an estimate, since many assumptions were made in the calculation. The assumptions and the spreadsheet of calculations are also included in Appendix J.

4.2 Delineation of LNAPL

The extent of the LNAPL plume at the Osmose facility has been defined. The plume extends from the vicinity of the suspected release (former tank pit area and transfer lines) east past the entrance gate area to the sewer line under Ellicott Street where it extends north to the vicinity of monitoring well MW-25. Gauging of monitoring wells MW-21 and MW-22 indicates the sewer line is a barrier to further plume migration to the east. Soil borings along the sewer line indicate that the sewer line is not bedded with a permeable material. The potential for LNAPL migration north (downslope) along the sewer line is limited by the lack of a more permeable material around the sewer encasement. Sampling of the sewer indicated that LNAPL is not infiltrating into the line and migrating preferentially within the sewer.

Figure 9 presents the areal extent of LNAPL at the Osmose facility. As mentioned above, mass balance calculations estimate that 300-500 gallons of LNAPL still exist in the subsurface. To date, a total of approximately 450 gallons of product have been removed by manual bailing and the EZY Skimmers deployed in monitoring wells MW-3 and MW-7.

The presence of LNAPL under the Osmose office building has not been confirmed. Neither monitoring wells MW-17 or MW-24 have shown any LNAPL during gauging events. Soil samples collected from

MW-24 showed only low levels (3,800-7,800 μg/kg) of PAHs, however, MW-17 possessed adsorbed PAH levels as high as 390,000 μg/kg indicating that the extent of LNAPL is not far from the well. With this information, it is not believed that the extent of LNAPL under the Osmose building, if present , is extensive (Figure 9). An aquifer pump test has been conducted during a parallel scope of work (associated with the ozone pilot test). The result of the pump test (to be reported with the pilot test report) will define aquifer drawn down characteristics which will indicate if recovery of LNAPL is possible under the building.

4.3 Soils Above 473 ppm PAHs

The Risk Assessment previously performed for the Osmose facility identified a proposed closure limit of 473 ppm for adsorbed PAHs in soils. The areal extent of adsorbed PAHs above 473 ppm has been defined, and corresponds closely to the extent of LNAPL (Figure 15, Areal Extent of Soils Above 473 ppm PAHs). The vertical distribution of soils above 473 ppm is primarily in the interval 7 to 10 feet below grade, which is at the top of the water table just below the clay layer (Figure 16, Figure 17).

The estimated volume of soils above 473 ppm PAHs has been adjusted from the number presented in the Supplemental Assessment Report based on the additional information gathered during the Phase II Investigation. The vertical extent has been narrowed to 3 feet, while the horizontal extent has been increased to over 700 square yards. These numbers yield an estimated volume of approximately 720 cubic yards of soils above the 473 ppm PAH level.

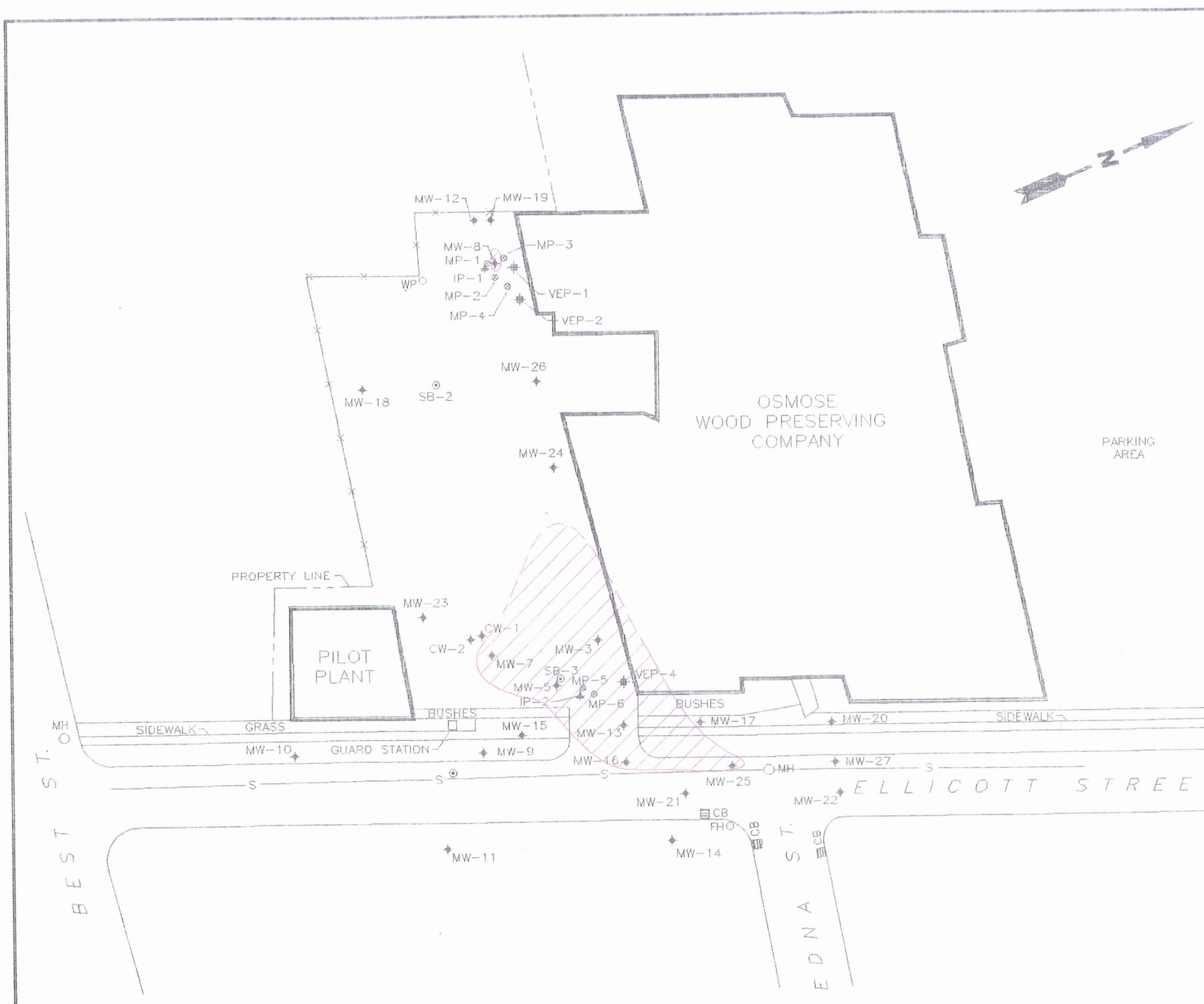
4.4 Soils Above 10 ppm VOCs

The Risk Assessment previously performed for the Osmose facility identified a proposed closure limit of 10 ppm for adsorbed volatile compounds in soils. Total adsorbed volatiles have been less than 10 ppm at all locations sampled to date (Figure 5). Volatile compounds represent less than one percent of the total adsorbed hydrocarbons on site (Appendix J, Hydrocarbon Mass Estimate).

4.5 Shallow Groundwater Quality

The groundwater for the shallow portion of the overburden aquifer has been confirmed by the installation of additional monitoring wells. The gradient is generally toward the east (Figure 7) at approximately 0.6%.

figure 15



LEGEND

- MONITORING WELL
- INJECTION POINT
- MONITORING POINT
- VAPOR EXTRACTION POINT
- SOIL BORING
- MH MANHOLE
- FH FIRE HYDRANT
- FENCE
- S SEWER LINE
- APPROXIMATE LOCATION OF SOILS ABOVE 473 ppm

0 50 100
SCALE FEET

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GROUNDWATER TECHNOLOGY
1245 KINGS ROAD
SCHENECTADY, N.Y. 12303
(518) 370-5631

REV. NO.:	DRAWING DATE:	ACAD FILE:
	1/21/93	AREAL92

AREAL EXTENT OF SOILS ABOVE 473 ppm

CLIENT: OSMOSE WOOD PRESERVING COMPANY			PM: BWA
LOCATION: ELLICOTT STREET BUFFALO, NEW YORK			GEO: JOG
DESIGNED: JOG	DETAILED: MET/DEO	PROJECT NO.: 01110-5307	FIGURE: 15

figure 16

WEST

A

EAST

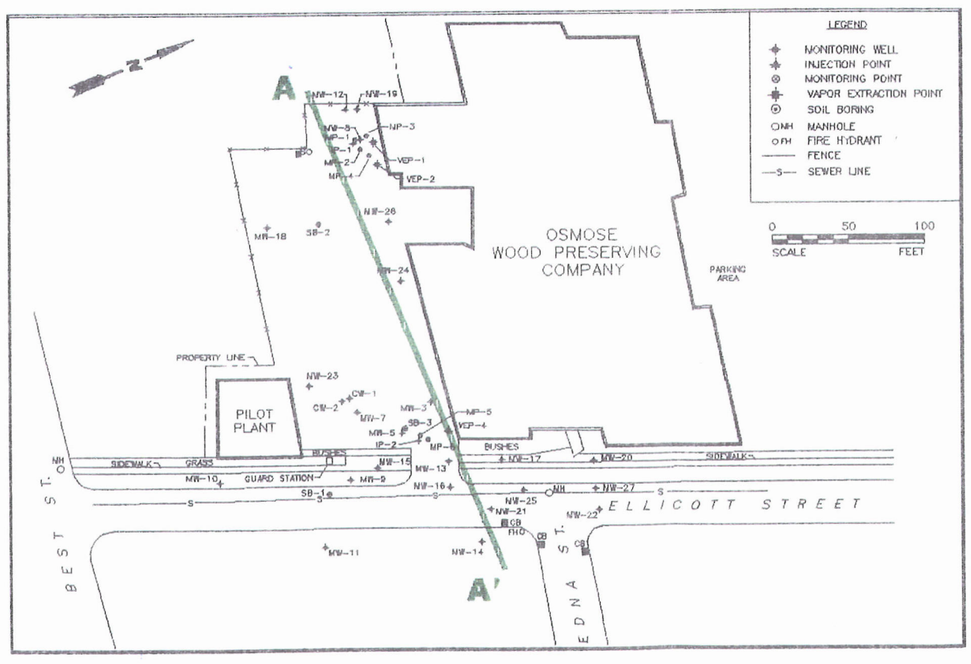
A'

MW-12 MW-19 MW-8 SB-2 MW-26 MW-24 MW-6 MW-3 MP-6 MW-13 MW-16 MW-21 MW-14

0
10
20
30
40
50
60

6-8': .04/.03
18-20': .0008/.02
2-4': 98/ND
2-4': 501/ND
16-18': .005/ND
54-55': ND/ND
2-4': 0.3/ND
8-10': 0.5/0.02
8-10': 0.67/0.65
10'-12' ND/ND
18-20' ND/ND
8-10': 3.8/0.22
10'-12' 7.5/ND
18-20' 6.6/ND
SP SP SP SP
6-8': 622
6-8': 35/3
8-10': 1013/7.2
10-12': 81/7.5
6-7': 46/1.8
7-8': 639/9.1
18-20' .02/ND
6-7': .004/ND
7-8': .001/ND
18-20' .01/ND
10-12': ND/ND
61-63': .08/.01

10
0 30
SCALE IN FEET



LEGEND

GLACIAL OUTWASH DEPOSITS AND FILL
- FINE SANDS
- FINE TO COARSE SANDS WITH SILT/CLAY
- COARSE SANDS WITH GRAVEL
- SILTY SANDS WITH GRAVEL

GLACIAL LAKE DEPOSITS
- SILTY SANDS, SILTS, CLAYEY SANDS
- CLAY

6-7': .004/ND — DEPTH: PAHs/VOCs (FT.) (ppm)

SP— SEPARATE PHASE PRESENT IN WELL (ppm)

DEPTH THAT SATURATED SOILS WERE ENCOUNTERED DURING DRILLING

STATIC WATER TABLE (12/17/92)

APPROXIMATE EXTENT OF SOILS > 473 ppm PAHs

GROUNDWATER TECHNOLOGY
1245 KINGS ROAD
SCHENECTADY, NY 12303
(518) 370-5631

REV. NO.:	DRAWING DATE:	ACAD FILE:
	8/17/93	5307-16X

SOILS ABOVE 473 ppm PAHs CROSS-SECTION A - A'

CLIENT:	PM:
OSMOSE WOOD PRESERVING INC.	BWA
LOCATION: 980 ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	DEO	01110-5307	16

figure 17

SOUTH
B

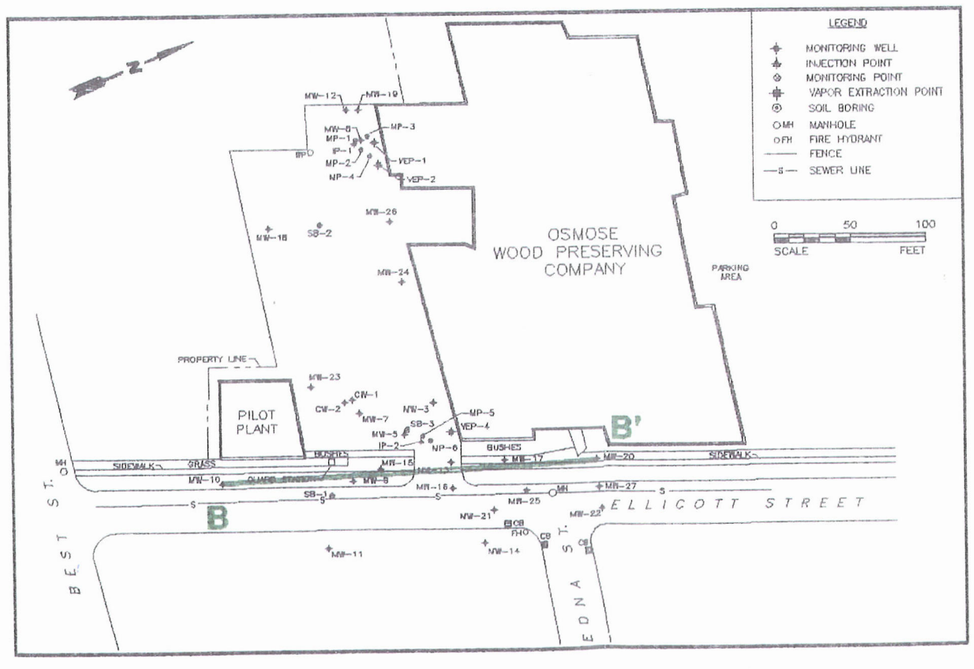
NORTH
B'

MW-10 | SB-1 MW-9 | MW-15 | MW-16 MW-13 | MW-17 | MW-20

0
10
20
30
40

4-6': .03/ND
6-7': .04/ND
10-11': .02/ND
4-6': .005/ND
10-12': 87/2.1
30-32': ND/ND
6-8': 54/ND
8-10': 87/2.1
18-20': .02/ND
18-20': .02/ND
SP
SP
6-7': 46/1.6
7-8': 639/9.1
6-8': 35/3.0
8-10': 1013/7.2
2-4': .005/ND
8-10': 393/5.8
18-20': 1.7/ND
6-7': .01/ND
7-8': ND/ND
18-20': ND/ND

0 10 0 30
SCALE IN FEET



LEGEND

GLACIAL OUTWASH DEPOSITS AND FILL
- FINE SANDS
- FINE TO COARSE SANDS WITH SILT/CLAY
- COARSE SANDS WITH GRAVEL
- SILTY SANDS WITH GRAVEL

GLACIAL LAKE DEPOSITS
- SILTY SANDS, SILTS, CLAYEY SANDS
- CLAY

2-4': .005/ND DEPTH: PAHs/VOCs (FT.) (ppm) (ppm)

SP- SEPARATE PHASE PRESENT IN WELL
ND- NONE DETECTED

STATIC WATER TABLE (12/17/92)

APPROXIMATE EXTENT OF SOILS > 473 ppm PAHs

GROUNDWATER TECHNOLOGY
1245 KINGS RD
SCHENECTADY, NY 12303
(518) 370-5631

REV. NO.:	DRAWING DATE:	ACAD FILE:
	8/17/93	5307-17X

SOILS ABOVE 473 ppm PAHs CROSS-SECTION B - B'

CLIENT:	PM:
OSMOSE WOOD PRESERVING INC.	BWA
LOCATION: 980 ELLICOTT STREET BUFFALO, NEW YORK	PE/RG: JOG

DESIGNED:	DETAILED:	PROJECT NO.:	FIGURE:
JOG	MET/DEO	01110-5307	17

The extent of the shallow dissolved hydrocarbon plume has been defined in terms of both PAHs and VOCs. The dissolved plumes are centered in the Ellicott Street entrance gate area immediately down gradient of the former tank pit. Migration to the east appears to have been limited by the sewer line beneath Ellicott Street.

Presented in Table 4-1 are the New York State groundwater guidance values and standards for the chemicals of concern at the Osmose site. Comparison of these values to the groundwater data gathered during the most recent sampling events indicates:

- Groundwater standards for benzene, toluene, ethyl benzene and total xylenes have been exceeded in 4 of the 13 monitoring wells sampled (MW-9, MW-15, MW-17 and MW-24).
- 1,2-dichlorobenzene standards have been exceeded in monitoring wells MW-9, MW-15 and MW-17.
- Acenaphthene and benzo[a]pyrene are the only PAH analytes which exceed groundwater standards. Dissolved levels of acenaphthene exceed the standard in monitoring wells MW-17 and MW-24, while the benzo[a]pyrene standard (ND) is exceeded in wells MW-8, MW-10, MW-12, MW-15, MW-17, MW-23, MW-24 and MW-26.
- Fluorene and phenanthrene exceed groundwater guidance values in one monitoring well (MW-17), while naphthalene and acenaphthylene exceed guidance values in two wells (MW-17 and MW-24).
- Benzo{b}fluoranthene exceeds groundwater guidance values (.002 μg/kg) in 10 of 13 monitoring wells, benzo{k}anthracene and benzo{k}fluoranthene exceed guidance values (.002 μg/kg) in 8 wells and chrysene and indeno{1,2,3-cd}pyrene exceed the guidance values (.002 μg/kg) in three wells.

When compared to historical groundwater sampling data from monitoring wells MW-8, MW-9, MW-10, MW-11, and MW-12 (January, 1991 and April, 1992 sampling events), dissolved PAH levels have not significantly changed over time (within the range of sampling variability). As previously stated, the dissolved constituents are less than one percent of the total hydrocarbons at this site.

Submitted as part of the Subsurface Investigation Report dated June 28, 1991, was a risk assessment which addressed potential risks associated with exposure to PAH in on- and off- site groundwater. The existing total carcinogenic risk estimate for groundwater was 1×10^{-8}, which is considerably less than the typically accepted criterion for acceptable risk. Likewise, the total hazard index for non-carcinogenic risks was approximately 6×10^{-2} (far below unit) which typically represents an acceptable risk.

TABLE 4-1

NYSDEC CLASS GA GROUNDWATER GUIDANCE VALUES AND STANDARDS (ug/l)

ANALYTE	NYSDEC STANDARD	NYSDEC GUIDANCE VALUE
Semi-Volatiles		
Naphthalene	NA	10
Acenaphthylene	NA	ND
1-Methylnaphthalene	NA	NA
2-Methylnaphthalene	NA	NA
Acenaphthene	20	NA
Fluorene	NA	50
Phenanthrene	NA	50
Anthracene	NA	50
Fluoranthene	NA	50
Pyrene	NA	50
Benzo{a}anthracene	NA	0.002
Chrysene	NA	0.002
Benzo{b}fluoranthene	NA	0.002
Benzo{k}fluoranthene	NA	0.002
Benzo{a}pyrene	ND	NA
Dibenzo{a,h}anthracene	NA	NA
Benzo{g,h,i}perylene	NA	NA
Indeno{1,2,3-cd}pyrene	NA	0.002
Volatiles		
Benzene	0.7	NA
Toluene	5	NA
Ethyl Benzene	5	NA
Total Xylenes	5	NA
Chlorobenzene	5	NA
1,2-Dichlorobenzene	4.7*	NA
1,3-Dichlorobenzene	5	NA
1,4-Dichlorobenzene	4.7*	NA

* Value applies to the sum of these substances.

KEY:
NA = Not Available
ND = Not Detectable

4.6 Deep Groundwater Gradient

The groundwater gradient for the deep portion of the overburden aquifer has been established. As measured on the December, 1992 gauging date, the deep groundwater gradient was toward the west at approximately 1.7 percent (Figure 8). This differs significantly from the shallow groundwater gradient in both direction and magnitude. Monitoring wells MW-18 and MW-19 are positioned downgradient from the presumed source area, while CW-1 is under the source area and MW-14 is upgradient.

4.7 Deep Groundwater Quality

The extent of the deep dissolved volatiles plume has been defined. The plume is centered under the south parking lot of the Osmose facility (Figure 11). NYSDEC groundwater standards were exceeded at only one site location: cluster well CW-1 (benzene). Levels were below groundwater standards at monitoring wells MW-14 (east of Ellicott Street), MW-18 (along the southern edge of the Osmose property), and MW-19 (along the western edge of the Osmose property).

The extent of the deep dissolved PAHs plume has also been defined. Once again, the plume is centered under the south parking lot of the Osmose facility (Figure 12). NYSDEC groundwater standards were exceeded only on site at two locations: cluster well CW-1 (acenaphthene, benzo{a}pyrene); and monitoring well MW-18 (benzo{a}pyrene). Levels were below groundwater standards at monitoring wells MW-14 (east of Ellicott Street) and MW-19 (along the western edge of the Osmose property).

4.8 Topography of Bedrock

As shown in Figure 5, Bedrock Surface Contour Map, the addition of deep wells MW-18 and MW-19 confirms that the surface of the Onondaga Limestone dips to the east. This appears to be a local variation from the south-southwest dip of the bedrock surface regionally (Stanbits and Miller, 1987).

4.9 Extent of DNAPL

No DNAPL has been detected to date at the bedrock surface. In relation to the slope of the bedrock surface (Figure 5), two of the four deep monitoring wells on site are positioned upslope from the source area (MW-18 and MW-19), one is under the source area (CW-1), and one is cross/downslope of the source area (MW-14).

4.10 PAHs in Surface Soils

Surface soil samples from the NFTA property to the south and west of the Osmose facility have all been below 473 ppm total PAHs, the proposed risk derived limit. PAH levels in surface soils fluctuated, however; the higher levels in surface soils correlate well with areas that were previously identified with brush fires. In addition, the predominance of highly condensed PAHs indicate that the source of PAHs was brush fires or anthropogenic sources and from the Osmose facility activities. Literature indicates that the PAH concentrations detected have been in the range typical for surface soils in an urban/industrial setting.

4.11 Municipal Sewer Impacts

Upgradient and downgradient sampling of the sewer line which exists beneath Ellicott Street indicated an increase in dissolved PAHs from 20 μg/l to 1,400 μg/l. The lighter, less complex PAHs were present in the highest concentrations, although an increase in all PAH analytes was noticed with the exception of acenaphthylene.

The BSA sets a limit of 4.26 mg/l total dissolved PAHs for a permitted discharge. Based upon this information, and the dissolved levels in the sewer line, it is not believed that potential infiltration of impacted groundwater causes an imminent danger to the BSA treatment system. Additionally, given the inherent variability associated with collecting grab samples from municipal sewer lines, and only one sampling event from which to base conclusions, it is unknown whether the increase is statistically significant.

5.0 INTERIM REMEDIAL MEASURES

5.1 Interim Remedial Recommendations

The objective of this section is to present interim remediation measures for each specific media at the Osmose Site. These measures are believed to be protective of short and long term health and environmental impacts until the results of the ozone injection pilot test can be published. Based upon the results of the pilot test, a site wide remediation strategy will be presented to the NYSDEC.

5.1.1 On Site Soils

Based upon available data, approximately 720 yd^3 of soils exist at the Osmose Site which possess adsorbed levels of PAHs above the proposed ASC of 473 ppm. As recommended in the Supplemental Investigation Report, remediation or removal of these soils are required. Results from the ozone pilot test are required prior to presentation of a final strategy to address the 720 cubic yards of impacted soils.

5.1.2 Liquid Phase Hydrocarbons

The areal extent of LNAPL at the Osmose Site has been defined. Manual bailing and EZY Skimmers have collected approximately 450 gallons of product to date. Mass balance calculations indicate approximately 300 - 400 gallons of product still remaining in the environment.

As part of the ozone pilot test, groundwater is being pumped from six recovery wells to create an unsaturated zone below the impermeable clay layer in the study area. Any LNAPL which enters the wells is removed via a total fluids pump. The pilot test is also designed to determine the effects of ozone injection on the LNAPL. Pending the results of the pilot test, continued removal of any LNAPL from the recovery wells, in addition to continued weekly gauging and bailing of the monitoring wells, will be performed.

5.1.3 On and Off Site Groundwater

New York State guidance values and standards were exceeded at several on and off site monitoring locations. Risk assessment calculations submitted with the Subsurface Investigation and Supplemental Investigation Reports addressed potential risks associated with exposure to groundwater. The total carcinogenic and non-carcinogenic risk estimates were below the proposed criteria for acceptable risk.

The effects of ozone sparging on dissolved PAH concentrations is also being studied during the pilot test.

5.2 Remedial Pilot Testing

In order to determine the appropriate remedial action for the Osmose Site, applicable technologies were screened for technical effectiveness, feasibility, advantages, disadvantages, and costs. The results of the screening, presented in the Supplemental Investigation Report, indicated ozone injection was the technology which has addressed the project objectives. Ozone injection, although a promising technology, is an unproven technology. An Ozone Pilot Test Work Plan dated September 25, 1992 was submitted to the NYSDEC. The objectives of the ozone pilot test are to monitor the effects of ozone injection into the subsurface on:

- adsorbed PAHs and VOCs in the unsaturated zone,
- adsorbed PAHs and VOCs in the saturated zone,
- dissolved PAHs and VOCs, and
- separate phase product (LNAPL).

A report detailing the results of the ozone pilot test will be submitted for review to the NYSDEC. Data obtained from the pilot test, if successful, will be used to design a scaled-up treatment system to address impacted media. If ozone injection is not successful in reducing PAH levels, an alternative remediation strategy which includes source reduction and hydraulic control of groundwater in the source area will be presented. Preliminary results from the ozone pilot test, however, appear to be very promising.

Prior to presenting a final remediation strategy for the Osmose site, a final decision as to the remediation goals must be negotiated between the NYSDEC and Osmose.

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

Thomas C. Jorling
Commissioner

November 9, 1992

Mr. Bruce Ahrens
Groundwater Technology
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

Osmose Wood Preserving, Inc.
Site No. 915143

The work plans for the Ozone Pilot Test dated September 25, 1992 and the Supplemental Investigation dated October 8, 1992 have been reviewed by the New York State Department of Health (NYSDOH) and this department. Our comments are as follows:

Ozone Pilot Test Workplan:

Section 2.5.1.2, Gas Phase Ozone Monitoring:

The Health and Safety Section states that action levels for ozone will be 0.05 PPM above background. When this level is exceeded workers must withdraw from the site and contact the project manager. The National Institute for Occupational Safety and Health recommends that a self contained breathing apparatus (SCBA) be donned if 1.0 PPM of ozone is found. Instead of the proposed periodic ozone monitoring in the basement of the building, continuous air monitoring must be conducted. The upper floor levels of the building must be monitored periodically.

Supplemental Investigation (Phase II) Work Plan:

Section 2.1.2, Boring Installation:

Since the soil conditions from the previous boring logs suggest that the contaminants may be migrating to greater depths, it is recommended that the depth of the shallow monitoring wells shall be approximately 20 feet below the ground surface.

Contamination in the Deeper Aquifer:

This work plan does not address the extent of contamination in the deeper aquifer. In order to determine whether or not the contaminants are leaving the site through lower aquifer, it will be necessary to install deep downgradient wells.

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In addition to this, if there are any sampling points in the nearby subway tunnel, Osmose shall collect samples from those points to find out if the contaminants from the site have migrated into the subway tunnel.

Other Comments:

1. During the October 23, 1992 meeting GTI personnel indicated that ozonation process will also remediate the contaminants in groundwater. In the event ozonation does not show a substantial decrease in ground water contaminants, other applicable technologies (e.g. Pump and Treat) must be considered in this work plan.

2. Since MW-13 is showing NAPL, there is possibility that the contaminants from the site are entering into the nearby storm sewer. Therefore, it is appropriate to test sewer water samples from upstream and downstream locations from the site.

3. As discussed during the October 23 meeting, some additional surficial soil samples from the adjoining vacant property on the south of the site shall be tested for PAHs.

4. Cleanup levels for the soils outside the biocell are still under review and will be forwarded to you once the decision is made.

Please incorporate our comments in the work plans and resubmit the Supplemental Investigation Work Plan by November 25, 1992. Also fill in the attached application for Air Permit and submit it along with the revised Supplemental Investigation Work Plan. In the meantime if there are any questions, please call me at (716) 851-7220.

Sincerely,

Jaspal S. Walia

Jaspal S. Walia, P.E.
Environmental Engineer II

JSW/ad
Attachment

cc: Mr. Michael Rider - Osmose
(No attach)

Telefax # 716 882-5139
OSMOSE WOOD PRESERVING, INC.
980 ELLICOTT STREET • BUFFALO, NY 14209-2398
(716) 882-5905 Telex 91328 Osmosewood Buf

TELEFAX COVER LETTER

Date: _____

Please deliver immediately to:

Name: Bruce Ahrens

Company: GTI

Fax No.: 518-370-5864

From: M. E. Rider

Time Sent: _____

Total No. of Pages: _____ (including cover letter)

If you do not receive all the pages, please call back as soon as possible.

GROUNDWATER TECHNOLOGY

Groundwater Technology, Inc.
1245 Kings Road, Schenectady, NY 12303
Tel: (518) 370-5631 Fax: (518) 370-5864

November 16, 1992

REFER: 01110-5307

Mr. Jaspal Singh Walia, P.E.
New York State Department of
Environmental Conservation
270 Michigan Ave
Buffalo, New York 14203

SUBJECT: Osmose Wood Preserving, Inc
NYS DEC Site #915143
Responses to NYS DEC letter dated November 9, 1992

Dear Mr. Walia,

Presented below are responses to the New York State Department of Environmental Conservation's (NYS DEC's) comments on the Ozone Pilot Test Work Plan, dated September 25, 1992, and the Supplemental - Phase II Investigation Work Plan, dated October 8, 1992 for the above referenced facility. These responses have been developed with Osmose and are presented in the same order as the comments presented in the letter dated November 9, 1992 from the NYS DEC to my attention. The referenced letter was received in this office on November 13, 1992.

Ozone Pilot Test Workplan: Section 2.5.1.2, Gas Phase Ozone Monitoring.

An inspection of the Osmose facility indicated that a basement does not exist beneath the building proximate to either of the two pilot test areas. Continuous air monitoring will be conducted on the first floor in areas adjacent to the pilot tests. A CA Instruments, TG/KA series, gas detector with strip chart attachment will be utilized. This instrument has been investigated and approved for use by Groundwater Technology's corporate and regional health and safety personnel.

Each morning during the pilot tests, the previous evenings strip chart will be reviewed by Groundwater Technology's field personnel. The instrument will then be taken to monitor the work area. After the days field activities (approximately 1-2 hours), the instrument will be returned to the Osmose facility for continuous recording. Mr. Michael Rider, Plant Operations Manager, will be responsible for reviewing the strip chart an additional 3 times per day (approximately every 2 hours).

Supplemental Investigation (Phase II) Work Plan; Section 2.1.2, Boring Installation.

Figure 9, Cross-Section of Soils Above 473 PPM, presented in the Supplemental Investigation Report presents the available data collected to date of the upper and lower boundaries of the relatively impermeable glacial lake deposits. Available data indicates the lower contact to be approximately 15 feet below grade in the vicinity of the proposed wells. The depths of the three (minimum) proposed borings (MW-15, MW-16, and MW-16) were determined so as to not penetrate through this confining layer.

At proposed locations MW-15 and MW-16, Groundwater Technology will utilize a drilling technique which will prevent contaminated soils from being brought down through the bore holes as the augers are advanced. Telescoping of augers, with the outer augers set near the bottom of the clay contact, will be evaluated. If telescoping of augers is used, the inner augers will be advanced to a depth of 20 feet. Continuous soil samples will be collected. As an alternative technique, if a 5 foot split spoon sampler can be located by the drilling subcontractor, the augers will be advanced to a depth of 15 feet below grade (or the bottom of the clay contact, whichever comes first) and the split spoon sampler driven to a depth of 20 feet. Groundwater Technology will confirm the choice of drilling technique with the NYS DEC.

As proposed in Section 2.2, samples will be selected for laboratory analysis based upon PID readings at each boring location.

The borehole will be tremie grouted closed from the bottom of the borehole to the bottom of the clay contact. As proposed in the work plan, the borings will be completed as FRP monitoring wells. The screened interval for each monitoring well will match the screened interval for adjacent well MW-13, which is screened from 4 to 14 feet below grade.

At the proposed location for MW-17, the field geologist will determine, based upon field data gathered during installation of MW-15 and MW-16, if the borehole needs to be advanced to a depth of 20 feet. Groundwater Technology's geologist will consult with the NYS DEC prior to finalization of the decision.

Contamination in Deep Aquifer.

Two deep downgradient wells (MW-18 and MW-19) will be installed at the Osmose facility. Approximate locations of the monitoring wells are as follows:

- Monitoring well MW-18 will be installed inside the southern fence line approximately 50 feet east of the western property boundary.
- Monitoring well MW-19 will be installed along the western property boundary approximately 10 feet north of MW-12.

The objectives of installing these two deep wells are:

- verification of the direction of the deep groundwater gradient, and
- delineation/determination if contaminants are migrating off-site via the deep aquifer.

A hollow-stem auger drilling rig will be used to complete the soil borings. Based upon existing data, the top of bedrock exists at approximately 60 - 65 feet below grade. At MW-18, continuous soil sampling will be completed to a depth of 20 feet below grade. From 20 feet to the top of bedrock, soil samples will be collected at five foot intervals if:

- To the best of the geologist's determination and use of field screening techniques (PID), samples collected at 20 feet below grade indicates no contamination is present, and
- The borehole has been advanced below the contact of the relatively impermeable glacial lake deposits and the more permeable glacial outwash deposits.

At MW-18, at a minimum, two soil samples will be collected and sent to GTEL Environmental Laboratories in Milford, NH for analysis of PAHs by EPA Method 8310, and volatile organic compounds (VOC's) by EPA Method 8020. One sample will be collected from 2 - 4 feet below grade, the other from just above bedrock. A third sample may be collected at the discretion of Groundwater Technology's site geologist.

The proposed location of MW-19 is less than 25 feet from existing MW-12. Installation of MW-12 occurred in March, 1992. Continuous split spoon samples were collected to a depth of 20 feet below grade. In lieu of the proximity of proposed MW-19 to existing well MW-12, split spoon samples will be collected at five foot intervals to a depth of 20 feet, at which point continuous sampling to bedrock will occur. One soil sample from above, and one sample from just above the bedrock will be collected and sent to the Milford laboratory for analysis by EPA Methods 8310 and 8020.

The laboratory's data package deliverables will conform to GTEL's Project Specific Blue Level QA/QC reporting requirements. Data collected during installation of these deep wells will undergo QA/QC review by an approved NYS Data Validator prior to final reporting.

Both borings will be completed as two inch diameter FRP monitoring wells. The wells will be screened in the aquifer immediately above bedrock (five feet of screened interval).

Actual drilling locations may be adjusted from the proposed locations based upon overhead obstructions or underground utilities. Unusual drilling conditioned (i.e. running sands) may inhibit the collection of split spoon samples. If these conditions exist, the NYS DEC will be notified immediately.

Mr. Michael Rider of Osmose contacted Mr. Harold Matuczak of NFTA Engineering to gather information regarding sampling points in the nearby subway tunnel. Conversation with Mr. Matuczak indicated that no sampling points exist in the cut and cover section of the subway. If the NYS DEC is aware of any sampling points in the subway tunnel, Osmose will sample a representative number of these points if groundwater samples from MW-18 and MW-19 indicate contaminated groundwater is migrating off-site.

Other Comments:

1. In the event the pilot test indicates that dissolved levels of contaminants are not decreased by ozone injection, an alternative remediation strategy will be proposed to the NYS DEC. The strategy will include source reduction (separate phase recovery and remediation of soils above the negotiated remediation goals) and hydraulic control of groundwater in the source area.

2. Two water samples will be collected from the combined storm/sanitary sewer which is located beneath Ellicott Street. One grab sample will be collected from the sewer manway located in the intersection of Best and Ellicott Streets (upgradient). The second sample will be collected from the manway located at the intersection of Edna and Ellicott Streets (in front of the Osmose facility). It is assumed that a sample can be collected from the Edna/Ellicott St. manway which is representative only of the sewer pipe which runs in front of the Osmose facility (i.e. before flow mixes with the Edna St. lateral).

Water samples collected from the sewer will be sent to GTEL Laboratories in Milford, NH for analysis of PAHs by EPA Method 8310. If present, suspended solids in the samples will be filtered at the laboratory. Due to the qualitative nature of the data quality objectives (DQOs) and the inherent variables in sampling sewer lines, it is proposed that laboratory results conform to a standard QA/QC reporting format.

3. Additional surficial soil sampling from the adjoining property to the south and west of the Osmose facility is proposed. A total of 6 surface grab samples will be collected and sent to the contract laboratory for analysis by EPA Method 8310. Locations for sample collection will be selected to:

   - define areas of historical brush fires, and
   - determine if a gradient corresponding to PAHs in surface soils exists

   Groundwater Technology will confirm grab sample locations with the NYS DEC prior to the sampling event. Permission for access onto the NFTA property has not been received as of this date.

4. Osmose and Groundwater Technology will await notification from the NYS DEC. Further discussions, if required, will take place at that time.

The completed Process, Exhaust or Ventilation (PEV) System Application For Permit To Construct is enclosed. Please feel free to contact me at (518) 370-5631 if you have any questions or comments on the above responses.

Sincerely
Groundwater Technology, Inc.

Bruce W. Ahrens
Sr. Project Manager

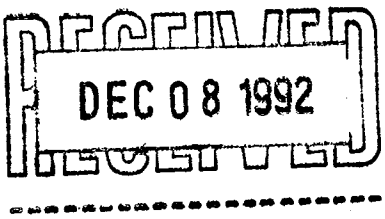
Copy: M. Rider/Osmose
O. Gustafson/GTI

43bc/Osmose\5307DEC.ltr

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

Thomas C. Jorling
Commissioner

December 3, 1992



Mr. Bruce Ahrens
Ground Water Technology, Inc.
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

Osmose Wood Preserving, Inc.
(Site I.D. #915143)
Buffalo, NY

This is in reference to your letter of November 16, 1992.

Please be advised that NYSDEC will not accept the analytical results of the filtered water samples from the sewer. Therefore, the water samples shall not be filtered.

If there are any questions please feel free to call me at 716-851-7220.

Yours truly,

Jaspal S. Walia

Jaspal S. Walia, P.E.
Environmental Engineer II

JSW/ad

cc: Dr. Frances Yang - NYSDEC
Mr. Michael Rider - Osmose

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GROUNDWATER TECHNOLOGY

Groundwater Technology, Inc.
1245 Kings Road, Schenectady, NY 12303
Tel: (518) 370-5631 Fax: (518) 370-5864

January 29, 1993

REFER:01110-5307

Mr. Jaspal Singh Walia, P.E.
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2999

RE: Osmose Wood Preserving, Inc. (Osmose)
NYS DEC Site # 915143
Completion of Supplemental Investigation

Dear Mr. Walia;

It was a pleasure meeting with you and Mr. Jerry Pietraszek on Friday, January 22, 1993 to discuss the data collected to date during investigation activities at the Osmose facility, and to discuss any gaps in the data which require additional investigation. The purpose of this letter is to review Groundwater Technology, Inc.'s (Groundwater Technology's) understanding of the agreed upon scope of work we developed during that meeting. A brief statement is also included which identifies the data quality objectives (DQO's) for this additional work.

Presented below are the items we discussed requiring further investigation at Osmose's Ellicott Street facility:

- delineation of the extent of impact of separate phase hydrocarbons in the sewer bedding which exists beneath Ellicott Street,
- delineation of the extent of dissolved hydrocarbons along Osmose's southeastern property boundary,
- delineation of the extent of separate, adsorbed, and dissolved phase hydrocarbons along the southern face of the Osmose building, west of monitoring well MW-3,
- delineation of adsorbed and dissolved hydrocarbons, if existing, in "shallow" downgradient soils and groundwater near the intersection of Ellicott and Edna Streets,
- completion of an additional groundwater sampling event of the "deep" aquifer, and

- delineation of surface soil quality at the properties to the south and west of the Osmose facility.

Each of these items, with the exception of the groundwater sampling and surface sampling events, requires the installation of soil borings completed as monitoring wells. The soil boring/monitoring well installation is briefly discussed below. The surface soil sampling, including QA/QC samples, is discussed in item # 3 (Other Comments) in the November 16, 1992 letter from Groundwater Technology to your attention, which responded to NYS DEC comments on the Supplemental Investigation Work Plan.

Location of Soil Borings/Monitoring Wells

A minimum of four soil borings will be installed at the Osmose site. All borings will be completed as fiberglass-reinforced epoxy (FRP) monitoring wells. The locations of monitoring wells MW-22, MW-23, MW-24, and MW-25 are presented in Figure 1, Proposed Monitoring Well Locations. Monitoring well MW-25 will be located within the backfill of the storm sewer trench approximately 30 - 40 feet northeast of MW-16, to determine if separate phase product has migrated northeast (downgradient) along the sewer trench. In the event that field testing indicates that the extent of separate phase has still not been defined in the bedding, additional soil boring/monitoring well installation will be performed at 30 - 40 foot intervals as necessary. If separate phase hydrocarbons are found after a second monitoring well has been installed in the backfill, Groundwater Technology will re-evaluate the spacing of additional wells. Well locations may be modified due to overhead obstructions or underground utilities. The NYS DEC will be notified in advance of any significant location modifications.

The Plans of The Proposed Sewer, September 15, 1941, were reviewed to verify flow direction in the sewer beneath Ellicott Street. Groundwater Technology is currently awaiting a response from the Buffalo Sewer Authority (BSA) as an additional confirmation to sewer flow direction.

Soil Boring/Monitoring Well Installation

Soil boring installation will follow the procedures and protocols defined in the Subsurface Investigation Work Plan, June 28, 1991. Continuous split spoon samples will be completed at all locations. All soil samples will be screened with a field photoionization detector (PID). In addition, field screening with an immunoassay test will be performed on selected soil samples by the field geologist.

At the soil boring location for MW-24, a drilling technique will be used which will prevent contaminated soils from being brought down through the borehole as the augers are advanced. Telescoping of augers, with the outer augers set at the top of the clay contact, or other appropriate methods, will be evaluated.

All monitoring wells will consist of two-inch diameter FRP well screen (0.020-inch slotted) and casing. Presented in Table 1.0 is a summary of the boring depths and screened intervals for each of the proposed locations. The screened intervals were selected to provide a shallow groundwater monitoring point situated within the finegrained lake deposits and to maintain consistency with previous well installations.

TABLE 1.0
SOIL BORING/MONITORING WELL
INSTALLATION DETAILS

WELL ID	BORING DEPTH	SCREENED INTERVAL
MW-22	25 feet	3.5 - 15 feet
MW-23	20 feet	3.5 - 15 feet
MW-24	20 feet	3.5 - 15 feet
MW-25	8 feet	3.5 - 8 feet

Analysis of Soil Samples

At a minimum, two soil samples from each boring will be collected and sent to the contract laboratory for analysis of Aromatic Volatile Organics (VOCs) by EPA Method 8020 and Polynuclear Aromatic Hydrocarbons (PAHs) by EPA Method 8310. Samples will be selected for laboratory analysis based upon the highest PID readings, and visual inspection, from above and below the water table at each boring location. The soil sample collected from each of the deepest boring depth will be sent to the contract laboratory.

Soil sampling equipment, procedures, preservation techniques and decontamination procedures are specified in the Subsurface Investigation Work Plan, Appendix D, Project Specific QA/QC Plan.

Groundwater Sample Collection

Shallow Groundwater

Following installation, the monitoring wells installed during this phase will be allowed to sit for a minimum of 24 hours before development. Following this equilibrium period, the monitoring wells will be developed by repetitive surging and bailing until the turbidity is less than 50 Nephelometric Units (NTU's), or a maximum of 5 well volumes had been removed.

The monitoring wells installed during this scope of work will be left undisturbed for at least one week after development to allow time for the wells to equilibrate with the surrounding aquifer. Groundwater samples will be collected from monitoring wells MW-22, MW-23 and MW-24. Prior to sample collection, 3 - 5 well volumes of water will be evacuated from each well. Before sampling occurs, the turbidity of the well will be measured and recorded in the field notebook. Field measurements of temperature, pH, and conductivity of the groundwater will recorded (after evacuation of the well). Following field analysis, samples will be collected from monitoring wells MW-22, MW-23 and MW-24 and sent for analysis of VOCs by EPA Method 8020 and PAHs by EPA Method 8310. Monitoring well MW-25 will be gauged with an electronic interface probe only; no groundwater samples will be collected.

Deep Groundwater

Groundwater samples will be collected from the four deep monitoring wells which exist at the Osmose facility. These wells include: CW-1, MW-14, MW-18 and MW-19. Prior to sample collection, 3 - 5 well volumes of water will be evacuated from each well. Before sampling occurs, the turbidity of the well will be measured and recorded in the field notebook. Field measurements of temperature, pH, and conductivity of the groundwater will recorded (after evacuation of the well). Following field analysis, samples will be collected from the deep monitoring wells and sent for analysis of VOCs by EPA Method 8020 and PAHs by EPA Method 8310.

Sample Management and Quality Control

The sample management and quality control procedures to be undertaken during all sampling and analysis events in the above scope of work are specified in Appendix D of the Subsurface Investigation Work Plan. The quality control samples which will be collected, with the exception of the off-site surface samples, are summarized below in Table 2.0, Field QA/QC Samples. The laboratory's data package deliverables will conform to a Project Specific Blue Level Package. This level of QA/QC was approved by the NYS DEC for previous work phases. The Blue Level Package reports the results of the method blank, surrogate recoveries, matrix spike recoveries, and data precision while providing a QA non-conformance summary.

TABLE 2.0
FIELD QA/QC SAMPLES

MATRIX	QA/QC SAMPLE	EPA 8020 (VOCs)	EPA 8310 (PAHs)
Soil	Matrix Spike	(1)*	(1)*
	Matrix Spike Duplicate	(1)*	(1)*
	Rinseate Blank	1	1
Shallow & Deep Groundwater	Matrix Spike	(1)*	(1)*
	Matrix Spike Duplicate	(1)*	(1)*
	Rinseate Blank	1	1
	Trip Blank	1	NR

* No additional samples need to be collected. Contract laboratory will utilize excess samples.

1 Rinseate blank will not be generated during groundwater sampling since dedicated disposable bailors will be used.

Data Validation

All data collected during this field investigation will undergo a QA/QC review along with the previous data collected during the Supplemental Investigation (Phase II).

Please feel free to contact me at (518) 370-5631 with any questions or comments you may have regarding the above scope of work. Osmose is prepared to initiate the work tasks described above upon receipt of approval from the NYS DEC.

Sincerely,
GROUNDWATER TECHNOLOGY, INC.

Bruce W. Ahrens
Senior Project Manager

cc: M. Rider/Osmose
O. Gustafson/GTI Albany
T. Antonoff/GTI Buffalo

43bc\Osmose/5307Phse.III

enclosure: Proposed Monitoring Well Locations Map

GROUNDWATER TECHNOLOGY

New York State Department of Environmental Conservation
270 Michigan Avenue, Buffalo, New York, 14203-2999

Thomas C. Jorling
Commissioner

February 8, 1993

RECEIVED
FEB 11 1993

Mr. Bruce Ahrens
Groundwater Technology, Inc.
1245 Kings Road
Schenectady, New York 12303

Dear Mr. Ahrens:

Osmose Wood Preserving, Inc. 915143
Buffalo, New York

This is in reference to your January 29, 1993, letter regarding the supplemental investigation for the Osmose Wood Preserving Site. We have reviewed the proposed Work Plan outlined in the letter and find it acceptable.

Should there be any questions relative to this site, please feel free to contact me at 716/851-7220.

Sincerely,

Jaspal S. Walia

Jaspal S. Walia, P.E.
Environmental Engineer II

JSW:vam

cc: Mr. Michael Rider - Osmose

PRINTED ON RECYCLED PAPER

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 11/16/92

Hour	PID	%O_2	%LEL	MiniRam	Location			Sampler
					background	Work Zone	Downwind	
0800								
0900								
1000								
1100								
1200								
1300	ND	20.9	0.0	0.00	✓			JOG
1400	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1500	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1600	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1700								
1800								
1900								

Drilling MP-4

Drilling VEP-1

Drilling VEP-2

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 11/17/92

Hour	PID	%O_2	%LEL	MiniRam	Location			Sampler
					background	Work Zone	Downwind	
0800	ND	20.9	0.0	0.00	✓			JOG
0900								
Drilling MW-18 1000	ND	20.9	0.0	0.02		✓		JOG
	ND	20.9	0.0	0.01			✓	JOG
1100	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1200	ND	20.9	0.0	0.01		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1300	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1400	ND	20.9	0.0	0.01		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1500	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1600	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1700								
1800								
1900								

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 11/18/92

Hour	PID	%O_2	%LEL	MiniRam	Location			Sampler
					background	Work Zone	Downwind	
0800	ND	20.9	0.0	0.00	✓			JOF
0900								
1000								
1100								
1200								
Drilling MW-3 1300	ND	20.9	0.0	0.00		✓		JOF
	ND	20.9	0.0	0.00			✓	JOF
Drilling MW-2 1400	ND	20.9	0.0	0.00		✓		JOF
	ND	20.9	0.0	0.00			✓	JOF
Drilling MW-1 1500	ND	20.9	0.0	0.00		✓		JOF
	ND	20.9	0.0	0.00			✓	JOF
1600								
1700								
1800								
1900								

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 11/19/92

Hour	PID	%O_2	%LEL	MiniRam	Location			Sampler
					background	Work Zone	Downwind	
0800	ND	20.9	0.0	0.00	✓			JOG
Drilling IP-1 0900	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
Drilling MW-19 1000	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.02			✓	JOG
1100	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1200	ND	20.9	0.0	0.01		✓		JOG
	ND	20.9	0.0	0.01			✓	JOG
1300	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1400	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.01			✓	JOG
1500	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1600	ND	20.9	0.0	0.01		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1700								
1800								
1900								

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 11/30/92

Hour	PID	$\%O_2$	%LEL	MiniRam	Location			Sampler
					background	Work Zone	Downwind	
0800	ND	20.9	0.0	0.00	✓			JOG
0900								
Drilling MP-2 1000	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1100	8.1	20.5	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1200	1.0	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1300								
1400								
Drilling MP-6 1500	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.01			✓	JOG
1600	4.5	20.5	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1700								
1800								
1900								

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 12/1/92

Hour	PID	%O_2	%LEL	MiniRam	Location			Sampler
					background	Work Zone	Downwind	
0800	ND	20.9	0.0	0.00	✓			JOF
0900								
1000								
1100								
1200								
Drilling MP-5 1300	ND	20.9	0.0	0.00		✓		JOF
	ND	20.9	0.0	0.00			✓	JOF
1400	3.6	20.9	0.0	0.00		✓		JOF
	ND	20.9	0.0	0.00			✓	JOF
1500								
1600								
1700								
1800								
1900								

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 12/2/92

	Hour	PID	%O_2	%LEL	MiniRam	Location			Sampler
						background	Work Zone	Downwind	
	0800	ND	20.9	0.0	0.00	✓			JOG
Drilling VEP-4	0900	ND	20.9	0.0	0.00		✓		JOG
		ND	20.9	0.0	0.01			✓	JOG
	1000	1.9	20.9	0.0	0.00		✓		JOG
		ND	20.9	0.0	0.00			✓	JOG
Drilling MW-17	1100	ND	20.9	0.0	0.00		✓		JOG
		ND	20.9	0.0	0.00			✓	JOG
	1200	1.0	20.9	0.0	0.00		✓		JOG
		ND	20.9	0.0	0.00			✓	JOG
	1300	ND	20.9	0.0	0.01		✓		JOG
		ND	20.9	0.0	0.02			✓	JOG
	1400								
Drilling SB-3	1500	ND	20.9	0.0	0.00		✓		JOG
		ND	20.9	0.0	0.00			✓	JOG
	1600	3.0	20.9	0.0	0.00		✓		JOG
		ND	20.9	0.0	0.00			✓	JOG
	1700								
	1800								
	1900								

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 12/3/92

	Hour	PID	%O_2	%LEL	MiniRam	Location			Sampler
						background	Work Zone	Downwind	
	0800	ND	20.9	0.0	0.00	✓			JOF
Drilling MW-15	0900	ND	20.9	0.0	0.00		✓		JOF
		ND	20.9	0.0	0.01			✓	JOF
	1000	0.8	20.9	0.0	0.00		✓		JOF
		ND	20.9	0.0	0.00			✓	JOF
	1100	ND	20.9	0.0	0.00		✓		JOF
		ND	20.9	0.0	0.01			✓	JOF
	1200								
Drilling MW-16	1300	2.2	20.9	0.0	0.00		✓		JOF
		ND	20.9	0.0	0.00			✓	JOF
	1400	6.1	20.9	0.0	0.00		✓		JOF
		ND	20.9	0.0	0.00			✓	JOF
	1500								
	1600								
	1700								
	1800								
	1900								

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 12/4/92

Hour	PID	%O_2	%LEL	MiniRam	Location			Sampler
					background	Work Zone	Downwind	
0800	ND	20.9	0.0	0.00	✓			JOB
0900	ND	20.9	0.0	0.00		✓		JOB
	ND	20.9	0.0	0.00			✓	JOB
1000	ND	20.9	0.0	0.01		✓		JOB
	ND	20.9	0.0	0.01			✓	JOB
1100								
1200	ND	20.9	0.0	0.01		✓		JOB
	ND	20.9	0.0	0.02			✓	JOB
1300	ND	20.9	0.0	0.00		✓		JOB
	ND	20.9	0.0	0.01			✓	JOB
1400								
1500								
1600								
1700								
1800								
1900								

Drilling MW-20

Drilling MW-21

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 2/16/93

Hour	PID	%O_2	%LEL	MiniRam	Location			Sampler
					background	Work Zone	Downwind	
0800								
0900	ND	20.9	0.0	0.00	✓			JOG
1000	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1100	2.1	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1200								
1300	ND	20.9	0.0	0.00		✓		JOG
	ND	20.9	0.0	0.00			✓	JOG
1400								
1500								
1600								
1700								
1800								
1900								

Drilling MW-24

Lunch

Drilling MW-24

Drilling complete

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 2/17/93

	Hour	PID	%O_2	%LEL	MiniRam	Location			Sampler
						background	Work Zone	Downwind	
	0800	ND	20.9	0.0	0.00	✓			JOB
Drilling MW-23	0900	ND	20.9	0.0	0.00		✓		JOB
		ND	20.9	0.0	0.02			✓	JOB
	1000	ND	20.9	0.0	0.00		✓		JOB
		ND	20.9	0.0	0.00			✓	JOB
Drilling Completed	1100								
	1200								
Drilling MW-26	1300	3.4	20.9	0.0	0.00		✓		JOB
		ND	20.9	0.0	0.00			✓	JOB
	1400	ND	20.9	0.0	0.00		✓		JOB
		ND	20.9	0.0	0.00			✓	JOB
	1500	ND	20.9	0.0	0.00		✓		JOB
		ND	20.9	0.0	0.00			✓	JOB
Drilling Completed	1600								
	1700								
	1800								
	1900								

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 2/18/93

	Hour	PID	%O_2	%LEL	MiniRam	Location			Sampler
						background	Work Zone	Downwind	
	0800	ND	20.9	0.0	0.00	✓			JOB
Drilling MW-22	0900	ND	20.9	0.0	0.01		✓		JOB
		ND	20.9	0.0	0.00			✓	JOB
	1000	ND	20.9	0.0	0.00		✓		JOB
		ND	20.9	0.0	0.00			✓	JOB
	1100	ND	20.9	0.0	0.00		✓		JOB
		ND	20.9	0.0	0.00			✓	JOB
Drilling Completed	1200								
	1300								
Drilling MW-25	1400	ND	20.9	0.0	0.00		✓		JOB
		ND	20.9	0.0	0.00			✓	JOB
	1500	4.4	20.9	0.0	0.00		✓		JOB
		ND	20.9	0.0	0.00			✓	JOB
	1600	0.8	20.9	0.0	0.00		✓		JOB
		ND	20.9	0.0	0.01			✓	JOB
Drilling Completed	1700								
	1800								
	1900								

RESULTS OF AIR MONITORING

Project: Osmose Wood Preserving
Job No.: 011105307
Contaminants: fuel oil, creosote

Date: 2/19/93

Hour	PID	$\%O_2$	%LEL	MiniRam	Location			Sampler
					background	Work Zone	Downwind	
0800	ND	20.9	0.0	0.00	✓			JOE
0900	1.7	20.9	0.0	0.00		✓		JOE
	ND	20.9	0.0	0.00			✓	JOE
1000	1.5	20.9	0.0	0.00		✓		JOE
	ND	20.9	0.0	0.00			✓	JOE
1100								
1200								
1300								
1400								
1500								
1600								
1700								
1800								
1900								

Drilling MW-27

Drilling completed

GROUNDWATER TECHNOLOGY, INC.

Well I.D.: MW-15

Page 1 of 1

Project: OSMOSE PHASE II

Location: BUFFALO, NEW YORK

Project No.: 01110-5307 Date: 12/3/92

T.O.C. Elev.: Well Depth: 15 1/2'

Explor. Depth: 20' Hole Dia.: 6 1/2"

Casing – Dia.: 2" Length: 5' Type: FRE

Screen – Dia.: 2" Length: 10' Slot Size: 0.020"

Drilling Co.: EDI Driller: S. GINGRICH Logged by: J.O.G.

Drilling Method: HSA Sampling Method: 3" SPLIT-SPOON

Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Native Backfill | Sand/Gravel Pack | Well Screen | ▼ Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1		1	30%		5.1	1	0 – 2' moist, dark brown, SILT with some organic debris, little clay, sand, gravel
2						2	
3		2	70%		42.9	3	2' – 4' moist, red-brown, CLAY with some silt, trace sand
4						4	
5		3	70%		104	5	4' – 6' moist, brown, SAME
6						6	
7		4	100%		255	7	6' – 8' 6.0' – 7.0' moist, SAME 7.0' – 8.0' moist, brown, SILT and CLAY with trace sand
8						8	▼ 8.0' – 8.5' saturated, SAME
9		5	100%		236	9	8' – 10' 8.5' – 9.0' saturated, brown, CLAY with some silt, trace sand 9.0' – 10.0' saturated, brown, SILT and CLAY with trace sand
10						10	
11		6	100%		34.8	11	10' – 12' 10.0' – 11.0' SAME 11.0' – 12.0' saturated, brown, SILT and FINE SAND with little clay, trace coarse sand
12						12	
13		7	50%		25.2	13	12' – 14' SAME
14						14	
15		8	60%		24.5	15	14' – 16' SAME
16						16	
17		9	50%		32.0	17	16' – 18' saturated, gray, SILT and CLAY with trace gravel
18						18	
19		10	100%		18.7	19	18' – 20' saturated, gray, SILT and CLAY with trace sand
20						20	
21						21	
22						22	
23						23	
24						24	
25						25	

GROUNDWATER TECHNOLOGY, INC.

Well I.D.: MW-16

Page 1 of 1

Project: OSMOSE PHASE II
Location: BUFFALO, NEW YORK
Project No.: 01110-5307 Date: 12/3/92
T.O.C. Elev.: Well Depth: 15 1/2'
Explor. Depth: 20' Hole Dia.: 6 1/2"
Casing – Dia.: 2" Length: 5' Type: FRE
Screen – Dia.: 2" Length: 10' Slot Size: 0.020"
Drilling Co.: EDI Driller: S. GINGRICH Logged by: J.O.G.
Drilling Method: HSA Sampling Method: 3" SPLIT-SPOON
Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Native Backfill | Sand/Gravel Pack | Well Screen | Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1		1	0%		–	1	0 – 2' asphalt, base (no recovery)
2						2	
3		2	40%		1.7	3	2' – 4' dry, brown, CLAY with some silt, little sand
4						4	
5		3	50%		3.5	5	4' – 6' moist, SAME
6						6	
7		4	100%		174/310	7	▼ 6' – 8' 6.0' – 7.0' SAME 7.0' – 8.0' saturated, brown, SILT and CLAY with trace sand
8						8	
9		5	30%		122	9	8' – 10' SAME
10						10	
11		6	100%		45.5	11	10' – 12' saturated, brown, SILT with some clay, trace sand
12						12	
13		7	60%		26.1	13	12' – 14' SAME
14						14	
15		8	60%		25.8	15	14' – 16' saturated, brown, FINE SAND and SILT with some clay, trace gravel
16						16	
17		9	100%		21.5	17	16' – 18' SAME
18						18	
19		10	100%		6.0	19	18' – 20' 18.0' – 19.0' SAME 19.0' – 20.0' saturated, brown SILT and CLAY with trace sand
20						20	
21						21	
22						22	
23						23	
24						24	
25						25	

Well I.D.: MW-17

GROUNDWATER TECHNOLOGY, INC.

Page 1 of 1

Project: OSMOSE PHASE II
Location: BUFFALO, NEW YORK
Project No.: 01110-5307 Date: 12/2/92
T.O.C. Elev.: Well Depth: 15'
Explor. Depth: 20' Hole Dia.: 6 1/2"
Casing – Dia.: 2" Length: 5' Type: FRE
Screen – Dia.: 2" Length: 10' Slot Size: 0.020"
Drilling Co.: EDI Driller: S. GINGRICH Logged by: J.O.G.
Drilling Method: HSA Sampling Method: 3" SPLIT-SPOON
Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Native Backfill | Sand/Gravel Pack | Well Screen | Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1		1	30%		11.3	1	0 – 2' 0 – 1.0' concrete and base 1.0' – 1.5' moist, gray, FINE SAND and SILT with some gravel 1.5' – 2.0' moist, brown, SILT with some clay, little fine sand
2						2	
3		2	70%		31.8	3	2' – 4' moist, brown CLAY with some silt, trace coarse sand
4						4	
5		3	100%		9.2	5	4' – 6' 4.0' – 5.0' moist, brown, SILT and CLAY with little coarse sand and gravel 5.0' – 6.0' moist, red-brown, CLAY with little silt, trace gravel
6						6	
7		4	100%		141	7	▼ 6' – 8' 6.0' – 7.0' moist, SAME 7.0' – 8.0' saturated, brown, SILT and CLAY with trace gravel
8						8	
9		5	100%		417	9	8' – 10' SAME
10						10	
11		6	80%		78.2	11	10' – 12' SAME
12						12	
13		7	80%		45.7	13	12' – 14' saturated, gray, SILT with some clay, trace coarse sand
14						14	
15		8	50%		31.0	15	14' – 16' SAME
16						16	
17		9	70%		39.0	17	16' – 18' 16.0' – 17.0' SAME 17.0' – 18.0' saturated, gray, SILT with little clay, trace coarse sand
18						18	
19		10	100%		33.0	19	18' – 20' 18.0' – 19.5' SAME 19.5' – 20.0' saturated, brown, SILT and CLAY
20						20	
21						21	
22						22	
23						23	
24						24	
25						25	

Well I.D.: MW-18

GROUNDWATER TECHNOLOGY, INC.

Page 1 of 2

Project: OSMOSE PHASE II
Location: BUFFALO, NEW YORK
Project No.: 01110-5307 Date: 11/17/92
T.O.C. Elev.: Well Depth: 58'
Explor. Depth: 58' Hole Dia.: 6 1/2"
Casing – Dia.: 2" Length: 53' Type: FRE
Screen – Dia.: 2" Length: 5' Slot Size: 0.020"
Drilling Co.: EDI Driller: D. GRAMZA Logged by: J.O.G.
Drilling Method: HSA Sampling Method: 3" SPLIT-SPOON
Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Grout | Sand/Gravel Pack | Well Screen | Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1		1	10%		0.0	1	0 – 2' 0.0 – 0.5' asphalt 0.5' – 2.0' moist, dark gray, SILT with some gravel, little fine sand
2						2	
3		2	60%		0.0	3	2' – 4' moist, brown, SILT
4						4	
5		3	40%		0.0	5	4' – 6' moist, brown SILT and CLAY with trace gravel
6						6	
7		4	70%		0.0	7	6' – 8' moist, brown, CLAY with some silt, trace gravel
8						8	
9		5	70%		0.0	9	▼ 8' – 10' moist to saturated, brown, CLAY with little silt
10						10	
11		6	90%		0.0	11	10' – 12' 10.0' – 11.0' saturated, SAME 11.0' – 12.0' saturated, brown, SILT
12						12	
13		7	100%		0.0	13	12' – 14' saturated, brown, SILT with some fine sand
14						14	
15		8	50%		0.0	15	14' – 16' saturated, brown, SILT
16						16	
17		9	60%		0.0	17	16' – 18' saturated, gray-brown, SILT and FINE SAND
18						18	
19		10	60%		0.0	19	18' – 20' 18.0' – 19.0' SAME 19.0' – 20.0' saturated, gray-brown, CLAY with some silt and sand, little gravel
20						20	
21		11	60%		6.5	21	20' – 22' saturated, brown, SILT with trace gravel
22						22	
23		12	100%		16.6	23	22' – 24' saturated, brown, SILT with some clay
24						24	
25		13	100%		2.5	25	24' – 26' saturated, brown, SILT with some clay, little fine sand, trace gravel

Project: OSMOSE PHASE II

Location: BUFFALO NEW YORK

Well No.: MW-18

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
26						26	
27						27	
28						28	
29						29	
30		14	30%		12.3	30	29' – 31' saturated, gray, FINE and MEDIUM SAND with little gravel
31						31	
32						32	
33						33	
34						34	
35		15	20%		6.6	35	34' – 36' saturated, brown, SILT with some sand and gravel, little clay
36						36	
37						37	
38						38	
39						39	
40		16	30%		188	40	39' – 41' saturated, gray, MEDIUM to COARSE SAND and GRAVEL with some silt
41						41	
42						42	
43						43	
44						44	
45		17	40%		5.9	45	44' – 46' saturated, gray, FINE and MEDIUM SAND with some coarse sand, gravel, and silt
46						46	
47						47	
48						48	
49						49	
50		18	20%		1.8	50	48.5' – 50.5' saturated, gray, SAND and GRAVEL with some silt
51						51	
52						52	
53						53	
54						54	
55						55	
56						56	
57		19	40%		0.2	57	56.5' – 57.5' saturated, gray, SAME bedrock at 57.5'
58						58	

GROUNDWATER TECHNOLOGY, INC.

Well I.D.: MW-19

Page 1 of 2

Project: OSMOSE PHASE II

Location: BUFFALO, NEW YORK

Project No.: 01110-5307 Date: 11/19/92

T.O.C. Elev.: Well Depth: 54'

Explor. Depth: 55.5' Hole Dia.: 6 1/2"

Casing – Dia.: 2" Length: 49' Type: FRE

Screen – Dia.: 2" Length: 5' Slot Size: 0.020"

Drilling Co.: EDI Driller: D. GRAMZA Logged by: J.O.G.

Drilling Method: HSA Sampling Method: SPLIT-SPOON

Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete, Bentonite, Grout, Sand/Gravel Pack, Well Screen, Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1						1	
2						2	
3		1	60%		1.1	3	2' – 4' moist, brown, SILT with some clay and fine sand
4						4	
5						5	
6						6	
7						7	
8						8	
9						9	
10		2	100%		0.7	10	9' – 11' moist, red-brown, CLAY
11						11	
12						12	
13						13	
14						14	
15		3	100%		0.8	15	14' – 16' 14.0' – 15.5' saturated, red-brown and gray, SAME
16						16	15.5' – 16.0' saturated, red-brown, SILT with some clay
17						17	
18						18	
19						19	
20		4	50%		1.3	20	19' – 21' saturated, gray-brown, SILT
21						21	
22						22	
23		5	50%		0.7	23	22' – 24' saturated, gray, FINE SAND with some gravel, little silt
24						24	
25						25	

Project: OSMOSE PHASE II

Location: BUFFALO NEW YORK

Well No.: MW-19

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
26		6	50%		0.7	24' – 26'	saturated, brown SILT and GRAVEL with some sand, little clay
27		7	50%		0.7	26' – 28'	saturated, gray–brown, FINE SAND with some silt, trace gravel
28							
29		8	60%		0.7	28' – 30'	28' – 29' saturated, gray, SILT and FINE SAND 29' – 30' saturated, gray, SILT and CLAY with some gravel
30							
31		9	50%		1.2	30' – 32'	SAME
32							
33		10	50%		1.1	32' – 34'	saturated, gray, SAND and GRAVEL with some silt
34							
35		11	40%		1.3	34' – 36'	saturated, gray, GRAVEL with some silt and coarse sand
36							
37		12	50%		1.5	36' – 38'	saturated, gray, GRAVEL with some sand, little silt
38							
39		13	40%		0.0	38' – 40'	saturated, gray, SAME
40							
41						40' – 42'	no sample, hard object
42							
43		14	30%		0.1	42' – 44'	SAME
44							
45		15	25%		0.0	44' – 46'	saturated, gray, SILT and CLAY with some gravel
46							
47		16	30%		0.2	46' – 48'	saturated, gray, GRAVEL with some sand and silt
48							
49		17	40%		0.0	48' – 50'	SAME with 0.5' lens of silt and clay with some gravel
50							
51		18	30%		0.9	50' – 52'	saturated, gray GRAVEL with some sand and silt
52							
53		19	25%		0.2	52' – 54'	saturated, gray, COARSE SAND with some silt and gravel bottom 2" SILT and CLAY with some gravel
54							
55		20	50%		0.1	54' – 55'	saturated, gray, SAND and GRAVEL with some silt
56							
57							
58							

GROUNDWATER TECHNOLOGY, INC.

Well I.D.: MW-20

Page 1 of 1

Project: OSMOSE PHASE II
Location: BUFFALO, NEW YORK
Project No.: 01110-5307 Date: 12/4/92
T.O.C. Elev.: Well Depth: 15 1/2'
Explor. Depth: 20' Hole Dia.: 6 1/2"
Casing – Dia.: 2" Length: 5' Type: FRE
Screen – Dia.: 2" Length: 10' Slot Size: 0.020"
Drilling Co.: EDI Driller: S. GINGRICH Logged by: J.O.G.
Drilling Method: HSA Sampling Method: 3" SPLIT-SPOON
Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Native Backfill | Sand/Gravel Pack | Well Screen | Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1		1	30%		0	1	0 – 2' 0 – 1.0' concrete, base 1.0' – 2.0' moist, brown, SILT and GRAVEL with some sand
2						2	
3		2	50%		0	3	2' – 4' moist, brown, CLAY with some silt, trace sand
4						4	
5		3	80%		0	5	4' – 6' SAME
6						6	
7		4	80%		0	7	▼ 6' – 8' 6.0' – 7.0' moist, red-brown, CLAY with little silt 7.0' – 8.0' saturated, brown, SILT and CLAY
8						8	
9		5	100%		0	9	8' – 10' 8.0' – 8.5' SAME 8.5' – 9.5' saturated, brown, CLAY with some silt, trace sand
10						10	9.5' – 10.0' saturated, brown SILT and CLAY with trace gravel
11		6	70%		0	11	10' – 12' saturated, brown, SILT with some clay, trace sand
12						12	
13		7	60%		0	13	12' – 14' SAME
14						14	
15		8	80%		0	15	14' – 16' 14.0' – 15.0' SAME 15.0' – 16.0' saturated, gray, FINE SAND and SILT
16						16	
17		9	80%		0	17	16' – 18' SAME
18						18	
19		10	90%		0	19	18' – 20' SAME, grading to SILT and CLAY with little medium sand
20						20	
21						21	
22						22	
23						23	
24						24	
25						25	

GROUNDWATER TECHNOLOGY, INC.

Well I.D.: MW-21

Page 1 of 1

Project: OSMOSE PHASE II
Location: BUFFALO, NEW YORK
Project No.: 01110-5307 Date: 12/4/92
T.O.C. Elev.: Well Depth: 15 1/2'
Explor. Depth: 20' Hole Dia.: 6 1/2"
Casing – Dia.: 2" Length: 5' Type: FRE
Screen – Dia.: 2" Length: 10' Slot Size: 0.020"
Drilling Co.: EDI Driller: S. GINGRICH Logged by: J.O.G.
Drilling Method: HSA Sampling Method: 3" SPLIT-SPOON
Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Native Backfill | Sand/Gravel Pack | Well Screen | Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1						1	0 – 2' ashphalt, concrete, base
2						2	
3		1	50%		0	3	2' – 4' dry, gray, CLAY with some silt, little sand
4						4	
5		2	50%		0	5	4' – 6' dry, brown, CLAY with some silt, trace sand
6						6	
7		3	100%		0	7 ▼	6' – 8' 6.0' – 7.0' moist, brown, CLAY with some silt, trace sand 7.0' – 7.5' saturated, SAME 7.5' – 8.0' saturated, brown, SILT with some clay, trace sand
8						8	
9		4	100%		0	9	8' – 10' 8.0' – 9.0' moist, brown, CLAY with some silt, trace sand 9.0' – 10.0' saturated, brown, SILT with some clay, trace sand
10						10	
11		5	80%		0	11	10' – 12' SAME
12						12	
13		6	100%		0	13	12' – 14' saturated, brown, SILT with little clay, trace gravel
14						14	
15		7	80%		0	15	14' – 16' saturated, brown, SILT with some fine sand, little clay, trace gravel
16						16	
17		8	70%		0	17	16' – 18' saturated, brown, FINE SAND with little silt
18						18	
19		9	100%		0	19	18' – 20' saturated, brown, FINE SAND and SILT
20						20	
21						21	
22						22	
23						23	
24						24	
25						25	

GROUNDWATER TECHNOLOGY, INC.

Well I.D.: MW-22

Page 1 of 1

Project: OSMOSE PHASE II

Location: BUFFALO, NEW YORK

Project No.: 01110-5307 Date: 2/18/93

T.O.C. Elev.: Well Depth: 15'

Explor. Depth: 25' Hole Dia.: 8 1/2"

Casing – Dia.: 2" Length: 3' Type: FRE

Screen – Dia.: 2" Length: 11 1/2' Slot Size: FRE 0.020"

Drilling Co.: EDI Driller: S. GINGRICH Logged by: J.O.G.

Drilling Method: HSA Sampling Method: SPLIT-SPOON

Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Native Backfill | Sand/Gravel Pack | Well Screen | ▼ Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1						1	
2						2	
3		1	70%		0.2	3	2' – 4' moist, brown/gray mottled, CLAY with little silt
4						4	
5		2	80%		0.4	5	4' – 6' red-brown, SAME
6						6	
7		3	80%		0.4	7	▼ 6' – 8' 6' – 7' SAME; 7' – 8' saturated, brown, SILT with little clay
8						8	
9		4	100%		0.4	9	8' – 10' 8' – 9' moist, red-brown CLAY with little silt; 9' – 10' saturated, brown, SILT with little clay
10						10	
11		5	90%		0.5	11	10' – 12' SAME
12						12	
13		6	90%		0.3	13	12' – 14' SAME
14						14	
15		7	70%		0.4	15	14' – 16' saturated, gray, SILT grading into FINE SAND
16						16	
17		8	60%		0.3	17	16' – 18' saturated, gray FINE SAND with some silt
18						18	
19		9	80%		0.3	19	18' – 20' 18' – 19' SAME; 19' – 20' saturated, brown, SILT with little clay
20						20	
21		10	80%		0.3	21	20' – 22' saturated, brown, SILT with little fine sand and clay
22						22	
23						23	
24		11	100%		0.3	24	23' – 25' fine sand and gravel saturated, brown, SILT and CLAY with little
25						25	

Well I.D.: MW-23

GROUNDWATER TECHNOLOGY, INC.

Page 1 of 1

Project: OSMOSE PHASE II
Location: BUFFALO, NEW YORK
Project No.: 01110-5307 Date: 2/17/93
T.O.C. Elev.: Well Depth: 15'
Explor. Depth: 20' Hole Dia.: 8 1/2"
Casing – Dia.: 2" Length: 3' Type: FRE
Screen – Dia.: 2" Length: 11 1/2' Slot Size: FRE 0.020"
Drilling Co.: EDI Driller: S. GINGRICH Logged by: J.O.G.
Drilling Method: HSA Sampling Method: SPLIT-SPOON
Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Native Backfill | Sand/Gravel Pack | Well Screen | ▼ Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1						1	
2						2	
3		1	70%		0.0	3	2' – 4' moist, brown SILT and CLAY
4						4	
5		2	50%		0.0	5	4' – 6' moist, brown, CLAY with little silt, and trace coarse sand
6						6	
7		3	100%		0.4	7	6' – 8' moist, red-brown, CLAY with little silt
8						8	
9		4	90%		0.5	9	▼ 8' – 10' 8' – 9' SAME 9' – 10' saturated, SAME
10						10	
11		5	70%		0.5	11	10' – 12' saturated, gray-brown, SILT with little clay
12						12	
13		6	70%		0.5	13	12' – 14' saturated, gray-brown, SILT
14						14	
15		7	50%		1.0	15	14' – 16' SAME
16						16	
17		8	70%		1.0	17	16' – 18' SAME
18						18	
19		9	50%		1.0	19	18' – 20' saturated, gray-brown, SILT with some clay
20						20	
21						21	
22						22	
23						23	
24						24	
25						25	

Well I.D.: MW-24

GROUNDWATER TECHNOLOGY, INC.

Page 1 of 1

Project: OSMOSE PHASE II
Location: BUFFALO, NEW YORK
Project No.: 01110-5307 Date: 2/16/93
T.O.C. Elev.: Well Depth: 15'
Explor. Depth: 20' Hole Dia.: 8 1/2"
Casing – Dia.: 2" Length: 3' Type: FRE
Screen – Dia.: 2" Length: 11 1/2' Slot Size: FRE 0.020"
Drilling Co.: EDI Driller: S. GINGRICH Logged by: J.O.G.
Drilling Method: HSA Sampling Method: SPLIT-SPOON
Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Native Backfill | Sand/Gravel Pack | Well Screen | ▼ Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1						1	
2						2	
3		1	50%		0.0	3	2' – 4' moist, brown and black, CLAY with some silt
4						4	
5		2	50%		0.0	5	4' – 6' moist, brown, CLAY with little silt, fine sand
6						6	
7		3	70%		5.0	7	6' – 8' moist, brown, CLAY with trace silt
8						8	8' – 9' SAME
9		4	90%		58	9	8' – 10' 9' – 9.5' moist, brown SILT and CLAY
10						10	▼ 9.5' – 10' saturated, brown, SILT with some clay
11		5	70%		18	11	10' – 12' saturated, brown, SILT with little clay
12						12	
13		6	60%		1.0	13	12' – 14' saturated, brown, SILT
14						14	
15		7	60%		0.5	15	14' – 16' saturated, brown, SILT and FINE SAND
16						16	
17		8	50%		0.0	17	16' – 18' SAME
18						18	
19		9	60%		0.0	19	18' – 20' SAME
20						20	
21						21	
22						22	
23						23	
24						24	
25						25	

Well I.D.: MW-25

GROUNDWATER TECHNOLOGY, INC.

Page 1 of 1

Project: OSMOSE PHASE II
Location: BUFFALO, NEW YORK
Project No.: 01110-5307 Date: 2/18/93
T.O.C. Elev.: Well Depth: 9'
Explor. Depth: 9' Hole Dia.: 8 1/2"
Casing – Dia.: 2" Length: 4' Type: FRE
Screen – Dia.: 2" Length: 5' Slot Size: FRE 0.020"
Drilling Co.: EDI Driller: S. GINGRICH Logged by: J.O.G.
Drilling Method: HSA Sampling Method: SPLIT-SPOON
Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Native Backfill | Sand/Gravel Pack | Well Screen | ▼ Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1						1	
2		1	40%			2	1 – 3' dry, gray and black, CLAY with little silt
3						3	
4		2	60%			4	3' – 5' drry, brown, SAME
5						5	
6		3	70%			6	5' – 7' moist, SAME
7						7	▼ 7' – 8' saturated, brown, SILT and CLAY
8		4	90%			8	7' – 9' 8' – 9' saturated, brown, SILT with some clay.
9						9	
10						10	
11						11	
12						12	
13						13	
14						14	
15						15	
16						16	
17						17	
18						18	
19						19	
20						20	
21						21	
22						22	
23						23	
24						24	
25						25	

GROUNDWATER TECHNOLOGY, INC.

Well I.D.: MW-26

Page 1 of 1

Project: OSMOSE PHASE II
Location: BUFFALO, NEW YORK
Project No.: 01110-5307 Date: 2/17/93
T.O.C. Elev.: Well Depth: 15'
Explor. Depth: 20' Hole Dia.: 8 1/2"
Casing – Dia.: 2" Length: 3' Type: FRE
Screen – Dia.: 2" Length: 11 1/2' Slot Size: FRE 0.020"
Drilling Co.: EDI Driller: S. GINGRICH Logged by: J.O.G.
Drilling Method: HSA Sampling Method: SPLIT-SPOON
Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Native Backfill | Sand/Gravel Pack | Well Screen | ▼ Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1						1	
2						2	
3		1	40%		0.0	3	2' – 4' moist, black to gray/brown mottled, CLAY with little silt
4						4	
5		2	80%		0.5	5	4' – 6' moist, gray/brown mottled, CLAY with trace silt
6						6	
7		3	100%		9.2	7	6' – 8' SAME
8						8	
9		4	100%		90	9	8' – 10' moist, brown, CLAY with some silt
10						10	▼
11		5	70%		0.5	11	10' – 12' saturated, brown, SILT with little clay
12						12	
13		6	80%		0.5	13	12' – 14' saturated, brown, SILT
14						14	
15		7	50%		1.0	15	14' – 16' saturated, gray, FINE SAND with little silt
16						16	
17		8	100%		1.0	17	16' – 18' saturated, brown, SILT and CLAY
18						18	
19		9	100%		0.5	19	18' – 20' saturated, brown, CLAY and FINE SAND
20						20	
21						21	
22						22	
23						23	
24						24	
25						25	

GROUNDWATER TECHNOLOGY, INC.

Well I.D.: MW-27

Page 1 of 1

Project: OSMOSE PHASE II
Location: BUFFALO, NEW YORK
Project No.: 01110-5307 Date: 2/19/93
T.O.C. Elev.: Well Depth: 9'
Explor. Depth: 9' Hole Dia.: 8 1/2"
Casing – Dia.: 2" Length: 4' Type: FRE
Screen – Dia.: 2" Length: 5' Slot Size: FRE 0.020"
Drilling Co.: EDI Driller: S. GINGRICH Logged by: J.O.G.
Drilling Method: HSA Sampling Method: SPLIT-SPOON
Notes: FILTER PACK MATERIAL: #2 SAND

Sketch Map: SEE SITE MAP FOR LOCATION

Key: Concrete | Bentonite | Native Backfill | Sand/Gravel Pack | Well Screen | Water Table

Depth (feet)	Well Construction	Sample No.	% Rec.	Blows/ Density	PID Rdg. (ppm)	Depth (feet)	Soils/Lithology
0						0	
1						1	
2		1	25%		0.6	2	1 – 2' no recovery 1 – 3' 2' – 3' dry, gray and brown, CLAY with little silt
3						3	
4		2	50%		0.4	4	3' – 5' moist, SAME
5						5	
6		3	70%		0.3	6	5' – 7' SAME
7						7	▼
8		4	70%		0.0	8	7' – 9' saturated, brown, SILT and CLAY
9						9	
10						10	
11						11	
12						12	
13						13	
14						14	
15						15	
16						16	
17						17	
18						18	
19						19	
20						20	
21						21	
22						22	
23						23	
24						24	
25						25	

GROUNDWATER TECHNOLOGY

Project: Osmose
Location:
Date: 12/17/92
Operator: V. McBarry
Method:
Equipment #: I.S.

Project #: 0110-5307
036309
Time: 9:00 AM

WELL DATA MONITORING FORM

Well ID	Well Depth	T.O.C. Elev.	Depth to Water	Depth to Petro.	~~Petro. Thickness~~	~~Petro. Gravity~~	~~Hydro. Equiv.~~	Corrected ~~DTW~~	Corrected ~~Water Elev.~~
CW-1	63.70		26.22	—			PID	CO_2	AIR FLOW
MW-8	21.20		7.56	—	AFTER 1 MIN.		0	< 300 PPM	38 SCFM
MW-9	27.29		5.32	—	AFTER 5 MIN.		0	< 300 PPM	38 SCFM
MW-10	19.00		5.12	—					
MW-11	16.18		5.76	—					
MW-12	18.38		9.65	—		Reversed air flow to draw air from			
MW-13			4.90	4.75		Bio cell and checked it after			
MW-14	61.00		20.33	—		1 min. and after 5 min.			
MW-15	15.50		5.28	—					
MW-16	15.40		5.04	—		Returned system to original			
MW-17	15.40		5.34	—		operation - blowing air			
MW-18			28.68	sheen		into Bio cell.			
MW-19	54.58		30.84	—					
MW-20	15.50		6.01	—					
~~MW-21~~ Monitoring Pts:	15.40		4.82	—					

P.4
DEC 18 '92 08:53AM GROUNDWATER TECHNOLOGY
8716634688

SITE VISIT RECORD

036309

SITE NAME OSMOSE JOB NUMBER 01110-5307

DATE 12/18/92 NAME KEENE - BARRY

RENTAL EQUIPMENT USED PH-METER - TURBIDITY METER - TEMP + CONDUCTIVITY METER

☐ INTERFACE PROBE _____ ☐ PID:HNU _____ TIP ___ ☐ SURVEY

☐ SURFACE SAMPLERS;AMT. ____ ☐ EXPLOSIMETER _____ ☐ CAMERA _____

arrived on site 8:35 am. Signed in at OSMOSE office and began Bailing Wells prior to sampling. Checked each well for Conductivity - Temp - PH. and turbidity, before sampling - Sampled all Wells for EPA 8020 and 8310 - I was to sample MW18 for EPA 8270 - But MW18 Has free phase product on it - Could not reach Ole or Bruce - So this anaylsis did not Get done. Finished sampling at 2:30 pm and left site to prepare samples for lab and pack meters for return shippment

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

PROJECT OSMOSE PROJECT NUMBER 0110-5307
SUBJECT BY DK DATE 12-18-92
PAGE 1 OF 1
ENGINEER NAME

WELL	TURBIDITY	PH	CONDUCTIVITY	TEMP-C
CW1	58.80	7.92	1000	13°
MW8	49.90	7.42	7.50	14°
MW9	15.21	7.40	1400	13.5°
MW10	11.90	7.41	1050	14.2°
MW11	21.70	7.82	790	12.5°
MW12	44.60	7.40	900	13.5°
MW14	> 200	8.75	(WELL TOO DEEP FOR PROBE)	
MW15	60.50	7.47	1300	13.5°
MW16	FREE PRODUCT			
MW17	119.00	7.41	1900	15.0°
MW19	109.20	7.40	1050	13.8°
MW20	38.40	7.76	1050	13.5°
MW21	95.30	7.49	2150	15.0°

WELLS MW 13 - MW 16 AND MW18 HAVE FREE PHASE PRODUCT

SITE VISIT RECORD

SITE NAME O.S Mose JOB NUMBER 01110-7705

DATE 1/21/93 NAME Vince Bassy 030522

RENTAL EQUIPMENT USED

☐ INTERFACE PROBE ☐ PID:HNU TIP ☐ SURVEY

☐ SURFACE SAMPLERS;AMT. ☐ EXPLOSIMETER ☐ CAMERA

Arrived on site 8:30 am
Meet with Mike Rider
Wendy tour the site
Gauge mw-18 NO sheen or smell
DTW - 28.12
DTB - 57.72
Bailed Water from well
Water is Clean with NO Sheen OR Smell

Blower Gauge
Before Filter 0 vac After Filter 0 vac
Exhaust 1.4 psi
#2 2.0 psi

Blower & System is ON & working

Left site at 10:30 AM

GROUNDWATER TECHNOLOGY, INC.

SITE VISIT RECORD

SITE NAME Osmose JOB NUMBER 0110-5307 6309

DATE 2/18/93 NAME Vince Barry

RENTAL EQUIPMENT USED _____

☐ INTERFACE PROBE _____ ☐ PID:HNU _____ TIP ___ ☐ SURVEY

☐ SURFACE SAMPLERS;AMT. ___ ☐ EXPLOSIMETER ___ ☐ CAMERA ___

Arrived on site at 9:30 am

Weather: snowing & very cold -10.

Remove snow from Monitoring Wells

Gauge Wells mw-14, mw-18, mw-19, cw-1

Bailed each well and placed stored Bailed water inside a Drum.

Took Turbidity on all wells then Sample for EPA 8020 & 8310 plus Temp., PH, Conductivity

Wells	Turbidity	Temp.	PH	Conductivity x 1,000
mw-14	43.00	39.1	7.77	1.42
mw-18	.79	40.5	8.83	2.05
mw-19	6.84	38.4	8.30	2.41
cw-1	25.80	39.5	9.20	1.90

Took ~~#~~ Samples (liquid & Soil) and ~~#~~ Sent to GTEL on 2/19/93.

Left site at 5:30pm

GROUNDWATER TECHNOLOGY, INC.

GROUNDWATER TECHNOLOGY

Project: Osmose
Location: Buffalo NY.
Date: 2/18/93
Operator:
Method: Vince B.
Equipment #: I.P.

Project #: 01110-5307 \ 6309
Time: 10:00 AM

WELL DATA MONITORING FORM

Well ID	Well Depth	T.O.C. Elev.	Depth to Water	Depth to Petro.	Petro. Thickness	Petro. Gravity	Hydro. Equiv.	Corrected DTW	Corrected Water Elev.
MW-14			19.60	—					
MW-18			28.01	—					
MW-19			30.18	—					
CW-1			25.33	—					

Comments:

GROUNDWATER TECHNOLOGY

Project: Osmose
Location:
Date: 3/3/92
Operator: Vince Barry
Method:
Equipment #: I.P.

Project #: 0110-3307 \ 6309
Time: 11:30 AM

WELL DATA MONITORING FORM

Well ID	Well Depth	T.O.C. Elev.	Depth to Water	Depth to Petro.	~~Petro. Thickness~~	~~Petro.~~ Gravity (Turbidity)	~~Hydro.~~ Equiv.	~~Corrected~~ DTW	~~Corrected~~ Water Elev. (Volume of water Bailed)
MW-22			6.21	—		1.11		5 gallon	
MW-23			7.35	—		1.17		5 gallon	
MW-24			6.22	—		1.13		5 gallon	
MW-25			6.48	sheen		114.8		2 gallon	
MW-26			6.34	—		.44		5 gallon	
MW-27			6.30	—		32.4		2 gallon	

Comments:

GROUNDWATER TECHNOLOGY

Project: Osmose
Location:
Date: 3/10/93
Operator: Vince Barry
Method:
Equipment #: I.P.

Project #: 01110-5307 (6309)
Time: 9:30 AM

WELL DATA MONITORING FORM

Turbidity pH Temp. conductivity

Well ID	Well Depth	T.O.C. Elev.	Depth to Water	Depth to Petro.	Petro. Thickness	Petro. Gravity	Hydro Equiv.	Corrected DTW	Corrected Water Elev.
mw-22			5.97	—		.03	7.28	48.6	3.79
mw-23			6.23	—		1.79	7.45	50.5	3.38
mw-24			5.64	—		.68	8.06	51.0	1.69
mw-25			6.45	sheen		—	—	—	—
mw-26			5.00	—		.94	8.23	48.0	1.61
mw-27			6.22	—		—	—	—	—

Comments:

DATA VALIDATION / TECHNICAL DATA REVIEW

ORGANIC ANALYSES

Osmose Wood Preserving Project

Sampling Dates of November 17, 1992 - June 29, 1993

PREPARED FOR:

Groundwater Technology, Inc.
1245 Kings Road
Schenectady, New York 12303

August 1993

PREPARED BY:

ChemWorld Environmental, Inc.
14 Orchard Way North
Rockville, Maryland 20854
(301) 294-6144

Osmose Project/Technical Data Review: Organic Analyses

Table of Contents **Page**

	Introduction	1
1.0	Aromatic Volatile Organics by GC - Method 8020	3
1.1	Holding Times	3
1.2	Surrogate Recovery	3
1.3	Matrix Spike/Matrix Spike Duplicate (MS/MSD)	3
1.4	Field Blanks	3
1.5	Method Blanks	3
1.6	Field Duplicates	4
2.0	Polynuclear Aromatic Hydrocarbons by HPLC - Method 8310	4
2.1	Holding Times	4
2.2	Surrogate Recovery	4
2.3	MS/MSD	5
2.4	Field Blanks	6
2.5	Method Blanks	6
2.6	Field Duplicates	6

Tables

TABLE 1 Field Duplicate Sample Analysis - Precision For PAH's 7

Appendices

A	Data Summary Tables: Aromatic Volatile Organics - Method 8020
B	Data Summary Tables: Polynuclear Aromatic Hydrocarbons - Method 8310
C	Data Qualifiers
D	Case Narratives
E	Chain-of-Custody Forms

DATA VALIDATION / TECHNICAL DATA REVIEW SUMMARY

ORGANIC ANALYSES

Osmose Wood Preserving Project

Sampling Dates of November 17, 1992 - June 29, 1993

INTRODUCTION

This Data Validation/Technical Data Review Summary for organic analyses was generated for 5 water samples, 40 soil samples, and the associated quality control samples in support of site investigation activities for the Osmose Wood Preserving Project. The analytical laboratory work was performed by GTEL Environmental Laboratories, Inc.

Analytical testing consisted of aromatic volatile organic analyses by Gas Chromatography (GC) and Polynuclear Aromatic Hydrocarbons (PAH's) by High Performance Liquid Chromatography (HPLC). All analytical work was performed utilizing the United States Environmental Protection Agency's (USEPA's) **Test Methods for Evaluating Solid Waste, November 1986, SW-846, Third Edition.** The samples were analyzed utilizing the following methods:

Method 8020	Aromatic Volatile Organics
Method 8310	Polynuclear Aromatic Hydrocarbons

This report provides a summary of data acceptability and deviations in accordance with **USEPA National Functional Guidelines for Organic Data Review (Revised June 1991)** and information from the **New York State Department of Environmental Conservation (NYSDEC) Analytical Service Protocols (ASP), December 1991**, where applicable and relevant.

The laboratory provided a Conformance/Non-Conformance Quality Assurance/Quality Control (QA/QC) Summary Chart detailing whether the respective method and laboratory quality control requirements were met for the following areas:

* Initial Calibration for GC and HPLC
* Continuing Calibration for GC and HPLC
* Surrogate Recovery
* Holding Times
* Method Accuracy (Recovery of Matrix Spike)
* Method Precision (Relative Percent Difference of Matrix Spike Duplicate)

Summary sheets were provided within the modified analytical data package for review of the following items: surrogate recovery, Matrix Spike/Matrix Spike Duplicate samples, method blanks and holding times. Raw data including calibration summaries, instrument printouts, chromatograms, and quantitation reports were not provided for review. The analytical data packages were generated in accordance with the project-specific Workplan *Section 3.0, Sample QA/QC and Validation*, Page 12. Copies of the Case Narratives and Conformance/Non-Conformance QA/QC Summaries are included in Appendix D.

The data within this summary report is qualified based upon the information provided for review and the assumption that the laboratory Conformance/Non-Conformance QA/QC summaries are accurate.

This summary report pertains to the following samples:

MW-18:2-4'
MW-18:39-41'
MW-18:57-58'
DUP-2 (MW-18:2-4')
MW-19:2-4'
MW-19:54-55'
Field Blank (11/20/92)
Equipment Blank (11/20/92)
Trip Blank (11/20/92)

MW-24:18-20'
MW-23:6-8'
MW-23:16-18'
MW-23:18-20'
MW-26:10-12'
MW-26:18-20'
MW-22:4-6'
MW-22:10-12'
MW-22:23-25'
MW-27:7-9'
MW-24:8-10'
MW-24:10-12'
MW-26:8-10'
Equipment Blank (2/19/93)
Trip Blank (2/19/93)

MW-21:7-8'
MW-21:18-20'
MW-20:7-8'
MW-20:18-20'
MW-21:6-7'
MW-17:2-4'
MW-17:8-10'
MW-17:18-20'
MW-15:6-8'
MW-15:8-10'
MW-15:18-20'
MW-16:6-7'
MW-16:7-8'
MW-16:18-20'
MW-20:6-7'

SS-4
SS-5
SS-6
SS-7
SS-8
SS-9

1.0 AROMATIC VOLATILE ORGANICS BY GC - Method 8020

The following items/criteria were reviewed:

* Holding Times
* Surrogate Recovery
* Matrix Spike (MS) and Matrix Spike Duplicates (MSD)
* Blanks (Method and Field)
* Field Duplicates

In addition to the areas above, the laboratory Conformance/Non-Conformance QA/QC Summary chart documents acceptable initial and continuing calibration for the GC analyses.

1.1 Holding Times

All holding times were met within the acceptable time frame of 14 days from collection for the soil samples and 7 days from collection for the water samples.

1.2 Surrogate Recovery

All surrogate recovery was found to be generated within acceptable limits for the trifluorotoluene surrogate compound.

1.3 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

All MS/MSDs for the soil samples were generated within acceptable limits for Relative Percent Difference (RPD) and Percent Recovery (%R).

1.4 Field Blanks

1.4.1 Login Numbers M2-11-0512/0513/0552

One field blank, one equipment blank, and one trip blank were collected on 11/20/92 and analyzed by Method 8020. Contamination by aromatic volatiles was not detected in the field blanks.

1.4.2 Login Number M3-02-0523

One equipment blank and one trip blank were collected on 2/19/93 and analyzed by Method 8020. Contamination by aromatic volatiles was not detected in either blank.

1.5 Method Blanks

1.5.1 Login Number M2-12-0177

Two method blanks were analyzed by Method 8020 for the soil samples. Contamination by aromatic volatiles was not detected in either method blank.

1.5.2 Login Numbers M2-11-0512/0513/0552

Four method blanks were analyzed by Method 8020 for the soil samples. The method blank analyzed on 12/01/92 was found to be free of contamination by aromatic volatiles. One of three method blanks analyzed on 11/30/92 was found to contain aromatic volatile compounds. The laboratory attributes the contaminated method blank to carryover from rinse methanol. The remaining two blanks were free of contamination by aromatic volatiles. The data is not affected by the contaminated method blank. The samples associated with the method blanks of 11/30/92 did not exhibit contamination by aromatic volatile organics.

One method blank was analyzed by Method 8020 for the water samples. Contamination by aromatic volatiles was not detected.

1.5.3 Login Number M3-02-0523

Two method blanks were analyzed for the soil samples and one method blank was analyzed for the water samples. Contamination by aromatic volatile organics was not detected in any of the method blanks.

1.6 Field Duplicates

One duplicate pair, MW-18:2-4' and DUP-2, was analyzed to determine precision. Volatile organics were not detected in either sample, therefore, acceptable precision was generated.

2.0 POLYNUCLEAR AROMATIC HYDROCARBONS BY HPLC - Method 8310

The following items/criteria were reviewed:

* Holding Times
* Surrogate Recovery
* MS/MSD
* Blanks (Method and Field)
* Field Duplicates

In addition to the areas above, the laboratory Conformance/Non-Conformance QA/QC Summary chart documents acceptable initial and continuing calibration for the HPLC analyses.

2.1 Holding Times

All holding times were met within the acceptable time frames for the soil and water samples. Soil samples were extracted within 14 days of collection and analyzed within 40 days of extraction. Water samples were extracted within 7 days of collection and analzyed within 40 days of extraction.

2.2 Surrogate Recovery

Acceptable surrogate recovery was generated for Nitrobenzene-d5 and Terphenyl-d14 for the water and soil samples, with the following exceptions.

2.2.1 Login Number M2-12-0177

Sample ID		
MW-17:8-10'	Terphenyl-d14	306% R (Limit 33-141)
MW-16:7-8'	Terphenyl-d14	570% R

The samples above were diluted and reanalyzed. Percent recovery was not generated for the reanalyses due to the fact that the surrogates were diluted out.

The samples above were qualified as 'J', estimated, for the positive results, only, due to the high surrogate recovery generated.

2.2.2 Login Numbers M2-11-0512/0513/0552

Sample MW-19:2-4' required dilution to quantitate the sample. The surrogate compounds were diluted out, therefore, percent recovery was not generated. Qualification of the sample is not required.

2.2.3 Login Number M3-06-0827

Sample ID		
SS-4	Terphenyl-d14	318% R (Limit 33-141)
SS-4MS	Terphenyl-d14	150% R
SS-4MSD	Terphenyl-d14	217% R
SS-7	Terphenyl-d14	144% R

The positive results for the samples above were qualified as 'J', estimated, due to the high surrogate recovery generated.

2.3 MS/MSD

All MS/MSDs and Laboratory Control Samples (LCS) for the soil analyses were generated within acceptable limits for RPD and %R, with the following exceptions.

2.3.1 Login Number M3-02-0523

MW-24:8-10' MS/MSD		
MS	Napthalene	208% R (Upper Limit 122)
MS	Fluorene	203% R (Upper Limit 142)
MSD	Napthalene	150% R (Upper Limit 122)
MSD	Fluoranthene	68% RPD (Limit 60)

Sample MW-24:8-10' was qualified as 'J', estimated, for the three compounds above. The remaining samples did not require qualification.

2.3.2 Login Number M3-06-0827

The high concentrations in sample SS-4 precluded the generation of acceptable MS and MSD spike recovery. Acceptable recovery was generated for an LCS.

2.4 Field Blanks

2.4.1 Login Numbers M2-11-0512/0513/0552

One field blank and one equipment blank were collected on 11/20/92 and analyzed by Method 8310. Contamination by PAH's was not detected in the two field blanks.

2.4.2 Login Number M3-02-0523

One equipment blank was collected on 2/19/93 and analyzed by Method 8310. Contamination by PAH's was not detected.

2.5 Method Blanks

2.5.1 Login Number M2-12-0177

One method blank was analyzed for the soil samples analyzed by Method 8310. Contamination by PAH's was not detected in the method blank.

2.5.2 Login Number M2-11-0512/0513/0552

One soil method blank and one water method blank were analyzed for the soil and water samples. Contamination by PAH's was not detected in the method blanks.

2.5.3 Login Number M3-02-0523

One soil method blank and one water method blank were analyzed for the soil and water samples. Contamination by PAH's was not detected in the method blanks.

2.5.4 Login Number M3-06-0827

One soil method blank was analyzed by Method 8310. Contamination by PAH's was not detected.

2.6 Field Duplicates

Samples MW-18:2-4' and DUP-2 were collected and analyzed by Method 8310 as the field duplicate samples. In general, poor precision was generated for the duplicate pair. Non-homogeneity of the soil matrix may contribute to the poor precision generated. Table 1 includes calculated precision for the duplicates.

TABLE 1

FIELD DUPLICATE SAMPLE ANALYSIS

PRECISION FOR PAH's

Osmose Wood Preserving Project

Results in ug/Kg (ppb)

Parameter	MW-18:2-4'	DUP-2	RPD*
Phenanthrene	800	ND	++
Anthracene	1100	ND	++
Fluoranthene	1000	490	68%
Pyrene	800	ND	++
Benzo(a)anthracene	400	230	54%
Chrysene	380	ND	++
Benzo(b)fluoranthene	370	220	51%
Benzo(k)fluoranthene	180	93	64%
Benzo(a)pyrene	400	220	58%
Dibenzo(a,h)anthracene	65	ND	++
Benzo(g,h,i)perylene	210	140	40%
Indeno[1,2,3-cd]pyrene	360	180	67%

* Relative Percent Difference (Calculated Precision)

ND Not Detected

++ Unable to be calculated due to non-detected results

APPENDIX A

DATA SUMMARY TABLES

VOLATILE ORGANICS

OSMOSE WOOD PRESERVING PROJECT

AROMATIC VOLATILE ORGANICS/SOIL - DATA SUMMARY
MODIFIED EPA METHOD 8020

LOGIN NO.: M2-12-0177

All results reported in ug/Kg

Volatile Organics	MW-21 7-8'	Q	MW-21 18-20'	Q	METHOD BLANK (12/14)	Q
Benzene						
Toluene						
Ethylbenzene						
Xylenes (total)						
BTEX (total)						
Chlorobenzene						
1,2-Dichlorobenzene						
1,3-Dichlorobenzene						
1,4-Dichlorobenzene						

OSMOSE WOOD PRESERVING PROJECT

AROMATIC VOLATILE ORGANICS/SOIL - DATA SUMMARY
MODIFIED EPA METHOD 8020

LOGIN NO.: M2-12-0177 **All results reported in mg/Kg**

Volatile Organics	MW-20 7-8'	Q	MW-20 18-20'	Q	MW-21 6-7'	Q	MW-17 2-4'	Q	MW-17 8-10'	Q	MW-17 18-20'	Q
Benzene												
Toluene									0.36			
Ethylbenzene												
Xylenes (total)									5.4			
BTEX (total)									5.8			
Chlorobenzene												
1,2-Dichlorobenzene												
1,3-Dichlorobenzene												
1,4-Dichlorobenzene												
Methyl tert-Butyl Ether	N.A.		N.A.		N.A.		N.A.		N.A.		N.A.	

OSMOSE WOOD PRESERVING PROJECT

AROMATIC VOLATILE ORGANICS/SOIL - DATA SUMMARY (cont.)
MODIFIED EPA METHOD 8020

LOGIN NO.: M2-12-0177

All results reported in mg/Kg

Volatile Organics	MW-15 6-8'	Q	MW-15 8-10'	Q	MW-15 18-20'	Q	MW-16 6-7'	Q	MW-16 7-8'	Q	MW-16 18-20'	Q	MW-20 6-7'	Q	METHOD BLANK (12/08)	Q
Benzene																
Toluene																
Ethylbenzene																
Xylenes (total)			2.1				1.6		9.1							
BTEX (total)			2.1				1.6		9.1							
Chlorobenzene																
1,2-Dichlorobenzene																
1,3-Dichlorobenzene																
1,4-Dichlorobenzene																
Methyl tert-Butyl Ether	N.A.		N.A.		N.A.		N.A.		N.A.		N.A.		N.A.			

OSMOSE WOOD PRESERVING PROJECT

AROMATIC VOLATILE ORGANICS/SOIL - DATA SUMMARY
MODIFIED EPA METHOD 8020

LOGIN NUMBERS:
M2-11-0512
M2-11-0513
M2-11-0552

All results reported in ug/Kg

Volatile Organics	MW-18 2-4'	Q	MW-18 39-41'	Q	MW-18 57-58'	Q	DUP-2	Q	METHOD BLANK (12/01)	Q
Benzene										
Toluene										
Ethylbenzene										
Xylenes (total)										
BTEX (total)										
Chlorobenzene										
1,2-Dichlorobenzene										
1,3-Dichlorobenzene										
1,4-Dichlorobenzene										
Methyl tert-Butyl Ether	N.A.		N.A.		N.A.		N.A.		N.A.	

OSMOSE WOOD PRESERVING PROJECT

AROMATIC VOLATILE ORGANICS/SOIL - DATA SUMMARY
MODIFIED EPA METHOD 8020 (cont.)

LOGIN NUMBERS:
M2-11-0512
M2-11-0513
M2-11-0552

All results reported in mg/Kg

Volatile Organics	MW-19 2-4'	Q	MW-19 54-55'	Q	METHOD BLANK (11/30)	Q	METHOD BLANK (11/30)	Q	METHOD BLANK (11/30)	Q
Benzene					88					
Toluene					89					
Ethylbenzene					98					
Xylenes (total)					300					
BTEX (total)					580					
Chlorobenzene										
1,2-Dichlorobenzene										
1,3-Dichlorobenzene										
1,4-Dichlorobenzene										
Methyl tert-Butyl Ether	N.A.		N.A.							

OSMOSE WOOD PRESERVING PROJECT

AROMATIC VOLATILE ORGANICS/WATER - DATA SUMMARY
MODIFIED EPA METHOD 8020

LOGIN NUMBERS:
M2-11-0512
M2-11-0513
M2-11-0552

All results reported in ug/L

Volatile Organics	FIELD BLANK (11/20)	Q	EQUIP BLANK (11/20)	Q	TRIP BLANK (11/20)	Q	METHOD BLANK (11/25)	Q
Benzene								
Toluene								
Ethylbenzene								
Xylenes (total)								
BTEX (total)								
Chlorobenzene								
1,2-Dichlorobenzene								
1,3-Dichlorobenzene								
1,4-Dichlorobenzene								

OSMOSE WOOD PRESERVING PROJECT

AROMATIC VOLATILE ORGANICS-LOW LEVEL/SOIL - DATA SUMMARY
MODIFIED EPA METHOD 8020

LOGIN NO: M3-02-0523

All results reported in ug/Kg

Volatile Organics	MW-24 18-20'	Q	MW-23 6-8'	Q	MW-23 16-18'	Q	MW-23 18-20'	Q	MW-26 10-12'	Q	MW-26 18-20'	Q	MW-22 4-6'	Q	MW-22 10-12'	Q	MW-22 23-25'	Q
Benzene																		
Toluene																		
Ethylbenzene																		
Xylenes (total)																		
BTEX (total)																		
Chlorobenzene																		
1,2-Dichlorobenzene																		
1,3-Dichlorobenzene																		
1,4-Dichlorobenzene																		
Methyl tert-Butyl Ether	N.A.		N.A.		N.A.		N.A.		N.A.		N.A.		N.A.		N.A.		N.A.	

OSMOSE WOOD PRESERVING PROJECT

AROMATIC VOLATILE ORGANICS-LOW LEVEL/SOIL - DATA SUMMARY
MODIFIED EPA METHOD 8020 (cont.)

LOGIN NO: M3-02-0523

All results reported in ug/Kg

Volatile Organics	MW-27 7-9'	Q	METHOD BLANK (2/25)	Q
Benzene				
Toluene				
Ethylbenzene				
Xylenes (total)				
BTEX (total)				
Chlorobenzene				
1,2-Dichlorobenzene				
1,3-Dichlorobenzene				
1,4-Dichlorobenzene				
Methyl tert-Butyl Ether	N.A.			

OSMOSE WOOD PRESERVING PROJECT

AROMATIC VOLATILE ORGANICS/SOIL - DATA SUMMARY
MODIFIED EPA METHOD 8020

LOGIN NO.: M3-02-0523

All results reported in mg/Kg

Volatile Organics	MW-24 8-10'	Q	MW-24 10-12'	Q	MW-26 8-10'	Q	METHOD BLANK (2/25)	Q
Benzene								
Toluene								
Ethylbenzene								
Xylenes (total)	0.22							
BTEX (total)	0.22							
Chlorobenzene								
1,2-Dichlorobenzene					0.22			
1,3-Dichlorobenzene								
1,4-Dichlorobenzene					0.43			

OSMOSE WOOD PRESERVING PROJECT

AROMATIC VOLATILE ORGANICS/WATER - DATA SUMMARY
MODIFIED EPA METHOD 8020 (cont.)

LOGIN NO.: M3-02-0523 **All results reported in ug/L**

Volatile Organics	EQUIPMENT BLANK (2/19)	Q	TRIP BLANK (2/19)	Q	METHOD BLANK (2/26)	Q
Benzene						
Toluene						
Ethylbenzene						
Xylenes (total)						
BTEX (total)						
Chlorobenzene						
1,2-Dichlorobenzene						
1,3-Dichlorobenzene						
1,4-Dichlorobenzene						

APPENDIX B

DATA SUMMARY TABLES

PAHs

OSMOSE WOOD PRESERVING PROJECT

POLYNUCLEAR AROMATIC HYDROCARBONS/SOIL - DATA SUMMARY
EPA METHOD 8310

LOGIN NO.: M2-12-0177

All results reported in ug/Kg

Polynuclear Aromatic Hydrocarbons	MW-20 7-8'	Q	MW-20 18-20'	Q	MW-21 6-7'	Q	MW-21 7-8'	Q	MW-21 18-20'	Q	MW-17 2-4'	Q	MW-17 8-10'	Q	MW-17 18-20'	Q	MW-15 6-8'	Q
Naphthalene													68000	J	1200		2600	
Acenaphthylene																		
1-Methylnaphthalene													8500	J			990	
2-Methylnaphthalene													69000	J	190		8400	
Acenaphthene													25000	J			3000	
Fluorene													20000	J	48		2600	
Phenanthrene													100000	J	110		17000	
Anthracene													8500	J	35		2100	
Fluoranthene													30000	J	48		5700	
Pyrene													53000	J	37		11000	
Benzo(a)anthracene					0.81				2.2		1.0		3100	J	6.7			
Chrysene													4400	J	11			
Benzo[b]fluoranthene					1.4		0.84		2.5		2.2		1200	J	2.7		270	
Benzo[k]fluoranthene					0.75		0.65		1.1				580	J	1.5		120	
Benzo[a]pyrene					1.1				1.9				1000	J	2.3		220	
Dibenzo[a,h]anthracene													45	J			9.0	
Benzo[g,h,i]perylene													340	J			51	
Indeno[1,2,3-cd]pyrene									2.0		2.2		280	J			59	

OSMOSE WOOD PRESERVING PROJECT

POLYNUCLEAR AROMATIC HYDROCARBONS/SOIL - DATA SUMMARY
EPA METHOD 8310 (cont.)

LOGIN NO.: M2-12-0177

All results reported in ug/Kg

Polynuclear Aromatic Hydrocarbons	MW-15 8-10'	Q	MW-15 18-20'	Q	MW-16 6-7'	Q	MW-16 7-8'	Q	MW-16 18-20'	Q	MW-20 6-7'	Q	METHOD BLANK (12/16)	Q
Naphthalene	10000				4800		90000	J						
Acenaphthylene	180				130		2100	J						
1-Methylnaphthalene	1800				1200		24000	J						
2-Methylnaphthalene	17000				10000		170000	J						
Acenaphthene	6300				3200		61000	J						
Fluorene	4800				2800		41000	J						
Phenanthrene	23000				14000		94000	J						
Anthracene	2200				850		15000	J						
Fluoranthene	6800				3500		51000	J	13					
Pyrene	11000				3300		68000	J						
Benzo(a)anthracene	1300		0.72		540		5400	J	2.0					
Chrysene	1800				850		11000	J			7.4			
Benzo[b]fluoranthene	270		0.81		140		2100	J	2.8		2.2			
Benzo[k]fluoranthene	130				67		1000	J	1.5					
Benzo[a]pyrene	240				120		1900	J	2.0					
Dibenzo[a,h]anthracene	8.9				4.8		73	J						
Benzo[g,h,i]perylene	66				35		500	J						
Indeno[1,2,3-cd]pyrene	61				26		450	J						

OSMOSE WOOD PRESERVING PROJECT

POLYNUCLEAR AROMATIC HYDROCARBONS/SOIL - DATA SUMMARY
EPA METHOD 8310

LOGIN NUMBERS:
M2-11-0512
M2-11-0513
M2-11-0552

All results reported in ug/Kg

Polynuclear Aromatic Hydrocarbons	MW-18 2-4'	Q	MW-18 39-41'	Q	MW-18 57-58'	Q	MW-19 2-4'	Q
Naphthalene								
Acenaphthylene								
1-Methylnaphthalene								
2-Methylnaphthalene								
Acenaphthene								
Fluorene							3100	
Phenanthrene	800				32		14000	
Anthracene	1100				40		19000	
Fluoranthene	1000				31		19000	
Pyrene	800				10		8800	
Benzo(a)anthracene	400		1.3		9.9		7000	
Chrysene	380				16		7000	
Benzo[b]fluoranthene	370		1.8		11		6100	
Benzo[k]fluoranthene	180		1.0		6.3		2900	
Benzo[a]pyrene	400		1.7		11		6400	
Dibenzo[a,h]anthracene	65				2.4		700	
Benzo[g,h,i]perylene	210				6.9		3600	
Indeno[1,2,3-cd]pyrene	360				7.7			

OSMOSE WOOD PRESERVING PROJECT

POLYNUCLEAR AROMATIC HYDROCARBONS/SOIL - DATA SUMMARY
EPA METHOD 8310 (cont.)

LOGIN NUMBERS:
M2-11-0512
M2-11-0513
M2-11-0552

All results reported in ug/Kg

Polynuclear Aromatic Hydrocarbons	MW-19 54-55'	Q	DUP-2	Q	METHOD BLANK (12/01)	Q
Naphthalene						
Acenaphthylene						
1-Methylnaphthalene						
2-Methylnaphthalene						
Acenaphthene						
Fluorene						
Phenanthrene						
Anthracene						
Fluoranthene			490			
Pyrene						
Benzo(a)anthracene			230			
Chrysene						
Benzo[b]fluoranthene			220			
Benzo[k]fluoranthene			93			
Benzo[a]pyrene			220			
Dibenzo[a,h]anthracene						
Benzo[g,h,i]perylene			140			
Indeno[1,2,3-cd]pyrene			180			

OSMOSE WOOD PRESERVING PROJECT

POLYNUCLEAR AROMATIC HYDROCARBONS/WATER - DATA SUMMARY
EPA METHOD 8310

LOGIN NUMBERS:

M2-11-0512
M2-11-0513
M2-11-0552

All results reported in ug/L

Polynuclear Aromatic Hydrocarbons	FIELD BLANK (11/20)	Q	EQUIP BLANK (11/20)	Q	METHOD BLANK (12/01)	Q
Naphthalene						
Acenaphthylene						
1-Methylnaphthalene						
2-Methylnaphthalene						
Acenaphthene						
Fluorene						
Phenanthrene						
Anthracene						
Fluoranthene						
Pyrene						
Benzo(a)anthracene						
Chrysene						
Benzo[b]fluoranthene						
Benzo[k]fluoranthene						
Benzo[a]pyrene						
Dibenzo[a,h]anthracene						
Benzo[g,h,i]perylene						
Indeno[1,2,3-cd]pyrene						

OSMOSE WOOD PRESERVING PROJECT

POLYNUCLEAR AROMATIC HYDROCARBONS/SOIL - DATA SUMMARY
EPA METHOD 8310

LOGIN NO.: M3-02-0523

All results reported in ug/Kg

Polynuclear Aromatic Hydrocarbons	MW-24 8-10'	Q	MW-24 10-12'	Q	MW-24 18-20'	Q	MW-23 6-8'	Q	MW-23 16-18'	Q	MW-23 18-20'		MW-26 8-10'	Q	MW-26 10-12'	Q	MW-26 18-20'	Q
Naphthalene	790	J	1200															
Acenaphthylene																		
1-Methylnaphthalene	800		910										210					
2-Methylnaphthalene	700		2400															
Acenaphthene	150		310															
Fluorene	180	J	290										21					
Phenanthrene	600		850										230					
Anthracene	210		1100										60					
Fluoranthene	160	J	210										30					
Pyrene	110		110															
Benzo(a)anthracene	25		27		1.5								16					
Chrysene	23		42										27					
Benzo[b]fluoranthene	17		14		2.2		4.5						16					
Benzo[k]fluoranthene	6.4		6.1		1.2								3.7					
Benzo[a]pyrene	14		11		1.7								12					
Dibenzo[a,h]anthracene													1.6					
Benzo[g,h,i]perylene	18		8.6										30					
Indeno[1,2,3-cd]pyrene	7.2		4.6										7.9					

OSMOSE WOOD PRESERVING PROJECT

POLYNUCLEAR AROMATIC HYDROCARBONS/SOIL - DATA SUMMARY
EPA METHOD 8310 (cont.)

LOGIN NO.: M3-02-0523

All results reported in ug/Kg

Polynuclear Aromatic Hydrocarbons	MW-22 4-6'	Q	MW-22 10-12'	Q	MW-22 23-25'	Q	MW-27 7-9'	Q	METHOD BLANK (3/09)	Q
Naphthalene										
Acenaphthylene										
1-Methylnaphthalene										
2-Methylnaphthalene										
Acenaphthene										
Fluorene										
Phenanthrene										
Anthracene										
Fluoranthene										
Pyrene										
Benzo(a)anthracene										
Chrysene										
Benzo[b]fluoranthene	1.3									
Benzo[k]fluoranthene										
Benzo[a]pyrene										
Dibenzo[a,h]anthracene										
Benzo[g,h,i]perylene										
Indeno[1,2,3-cd]pyrene										

OSMOSE WOOD PRESERVING PROJECT

POLYNUCLEAR AROMATIC HYDROCARBONS/WATER - DATA SUMMARY
EPA METHOD 8310

LOGIN NO.: M3-02-0523

All results reported in ug/L

Polynuclear Aromatic Hydrocarbons	EQUIPMENT BLANK (2/19)	Q	METHOD BLANK (3/03)	Q
Naphthalene				
Acenaphthylene				
1-Methylnaphthalene				
2-Methylnaphthalene				
Acenaphthene				
Fluorene				
Phenanthrene				
Anthracene				
Fluoranthene				
Pyrene				
Benzo(a)anthracene				
Chrysene				
Benzo[b]fluoranthene				
Benzo[k]fluoranthene				
Benzo[a]pyrene				
Dibenzo[a,h]anthracene				
Benzo[g,h,i]perylene				
Indeno[1,2,3-cd]pyrene				

OSMOSE WOOD PRESERVING PROJECT

POLYNUCLEAR AROMATIC HYDROCARBONS/SOIL - DATA SUMMARY
EPA METHOD 8310

LOGIN NO.: M3-06-0827

All results reported in ug/Kg

Polynuclear Aromatic Hydrocarbons	SS-4	Q	SS-5	Q	SS-6	Q	SS-7	Q	SS-8	Q	SS-9	Q	METHOD BLANK (7/13)	Q
Naphthalene														
Acenaphthylene														
1-Methylnaphthalene														
2-Methylnaphthalene														
Acenaphthene														
Fluorene	1400	J	160		180		410	J			330			
Phenanthrene	5200	J	760				1600	J			1300			
Anthracene														
Fluoranthene	5600	J	1400		760		2300	J	570		1800			
Pyrene	3600	J	860		240		1500	J	270		1300			
Benzo(a)anthracene	2400	J	580		350		1100	J	260		860			
Chrysene	2500	J	820		490		1200	J	340		1000			
Benzo[b]fluoranthene	2000	J	640		400		1000	J	290		850			
Benzo[k]fluoranthene	990	J	270		170		470	J	130		380			
Benzo[a]pyrene	2100	J	620		400		1000	J	270		850			
Dibenzo[a,h]anthracene	450	J	83		99		250	J	67		23			
Benzo[g,h,i]perylene	2200	J	590		420		100	J	290		860			
Indeno[1,2,3-cd]pyrene	2800	J	910		610		1400	J	430		1200			

APPENDIX C

DATA QUALIFIERS

ORGANIC DATA QUALIFIERS

U - Indicates that the compound was analyzed for but not detected at or above the Contract Required Quantitation Limit (CRQL), or the compound is not detected due to qualification through the method or field blank.

J - The associated numerical value is an estimated quantity.

NJ - Tentatively identified with approximated concentrations.

UJ - The compound was analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance in quality control limits.

C - Applies to pesticide results where the identification has been confirmed by GC/MS.

E - Reported value is estimated due to quantitation above the calibration range.

D - Reported result taken from diluted sample analysis.

A - Aldol condensation product.

R - Reported value is unusable and rejected due to variance from quality control limits.

NA - Not Analyzed.

APPENDIX D

CASE NARRATIVES

GTEL
ENVIRONMENTAL
LABORATORIES, INC.
Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

RECEIVED
DEC 30 1992

December 28, 1992

Bruce Ahrens
Groundwater Technology, Inc.
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 12/05/92 under chain-of-custody records 47576, 51614 and 51615.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number 10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Susan C. Uhler
Laboratory Director

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

CONFORMANCE/NONCONFORMANCE SUMMARY

(X = Requirements Met * = See Comments NA = Not Applicable)

#	Conformance Item	VOA GC	VOA GC/MS	SV GC (HPLC APS)	SV GC/MS	Metals	Wet Chem
1	GC/MS Tune	NA	--	NA	--	NA	NA
2	Initial Calibration	X	--	X	--	--	--
3	Continuing Calibration	X	--	X	--	--	--
4	Surrogate Recovery	X	--	*	--	NA	NA
5	Holding Time	X	--	X	--	--	--
6	Method Accuracy	X	--	X	--	--	--
7	Method Precision	X	--	X	--	--	--

8 Blank Contamination - List/ND (None Detected)/*(See Comments)

VOA:	ND
SV:	ND
Metals:	--
Wet Chem:	--

9 Comments: **Method 8310:** → HPLC method

The surrogate recovery limits were exceeded for one compound in two samples due to sample specific matrix effect. The flagged data should be considered the maximum concentration of analyte present in the sample.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL
ENVIRONMENTAL
LABORATORIES, INC.
Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

RECEIVED
JAN - 5 1993

December 30, 1992

Bruce Ahrens
Groundwater Technology, Inc.
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 11/20/92 and 11/21/92 under chain-of-custody records 05181, 05182, 47174, 51627 and 51833.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number 10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Susan C. Uhler
Laboratory Director

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

CONFORMANCE/NONCONFORMANCE SUMMARY

(X = Requirements Met * = See Comments NA = Not Applicable)

#	Conformance Item	VOA GC	VOA GC/MS	SV HPLC	SV GC/MS	Metals	Wet Chem
1	GC/MS Tune	NA	--	NA	--	NA	NA
2	Initial Calibration	X	--	X	--	--	--
3	Continuing Calibration	X	--	X	--	--	--
4	Surrogate Recovery	X	--	*	--	NA	NA
5	Holding Time	X	--	X	--	--	--
6	Method Accuracy	X	--	X	--	--	--
7	Method Precision	X	--	X	--	--	--

8 Blank Contamination - List/ND (None Detected)/*(See Comments)

VOA:	*
SV:	ND
Metals:	--
Wet Chem:	--

9 Comments:

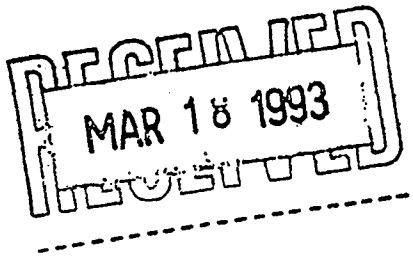
Method 8020 Medium Level:
Contamination was demonstrated to be isolated to the methanol blank which appears to be carryover from the rinse methanol. The instrument blank (BW11309220B) prepped and analyzed on 11/30/92 support that the instrument and methanol are free of contamination. Data not impacted.

Method 8310:
Percent Recovery limits were exceeded for one surrogate in ~~three~~ two samples due to the presence of interfering non-target compounds and high concentrations of target analytes. However, this type of contamination typically impacts this surrogate's recoveries only by contributing and interfering with the peak's integration. Data reported for the targets detected is not believed to be adversely impacted.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL
ENVIRONMENTAL
LABORATORIES, INC.
Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523



March 17, 1993

Bruce Ahrens
Groundwater Technology, Inc.
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 02/20/93 under chain-of-custody records 54146, 54147, 54148 and 53226.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,

GTEL Environmental Laboratories, Inc.

Susan C. Uhler
Laboratory Director

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

CONFORMANCE/NONCONFORMANCE SUMMARY

(X = Requirements Met * = See Comments NA = Not Applicable)

#	Conformance Item	VOA GC	VOA GC/MS	SV ~~GC~~ HPLC	SV GC/MS	Metals	Wet Chem
1	GC/MS Tune	NA	--	NA	--	NA	NA
2	Initial Calibration	X	--	X	--	--	--
3	Continuing Calibration	X	--	X	--	--	--
4	Surrogate Recovery	X	--	X	--	NA	NA
5	Holding Time	X	--	X	--	--	--
6	Method Accuracy	X	--	*	--	--	--
7	Method Precision	X	--	*	--	--	--

8 Blank Contamination - List/ND (None Detected)/*(See Comments)

VOA:	ND
SV:	ND
Metals:	--
Wet Chem:	--

9 Comments:

Method 8310:

The recovery limits were exceeded in the Batch Matrix Spike (MS) for Naphthalene and Fluorene due to sample specific matrix effect. The flagged values should be considered maximum concentrations present in the sample. The Laboratory Control Sample (LS0225-1) has been provided to support method accuracy.

The maximum relative percent difference (RPD) was exceeded for Fluoranthene in the sample duplicate due to demonstrated sample heterogeneity. The flagged value should be considered an estimated concentration present in the sample.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL
ENVIRONMENTAL
LABORATORIES, INC.
Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 005300109
Project ID: Osmose Wood Preserving
Login Number: M3-06-0827

August 2, 1993

Bruce Ahrens
Groundwater Technology, Inc.
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

This report, previously dated 07/19/93, is a reissue.

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 06/30/93 under chain-of-custody record 52718.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number 10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,

GTEL Environmental Laboratories, Inc.

Susan C. Uhler
Laboratory Director

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 3
To Andrea S	From BRIAN WAGNER
Co. Chemwest	Co. GTEL
Dept.	Phone #
Fax # 201-335-6440	Fax #

Client Number: 005300109
Project ID: Osmose Wood Preserving
Login Number: M3-06-0827

CONFORMANCE/NONCONFORMANCE SUMMARY

(X = Requirements Met * = See Comments NA = Not Applicable)

#	Conformance Item	VOA GC	VOA GC/MS	SV GC (HPLC)	SV GC/MS	Metals	Wet Chem
1	GC/MS Tune	NA	--	NA	--	NA	NA
2	Initial Calibration	--	--	X	--	--	--
3	Continuing Calibration	--	--	X	--	--	--
4	Surrogate Recovery	--	--	*	--	NA	NA
5	Holding Time	--	--	X	--	--	--
6	Method Accuracy	--	--	*	--	--	--
7	Method Precision	--	--	X	--	--	--

8 Blank Contamination - List/ND (None Detected)/*(See Comments)
VOA: --
SV: ND
Metals: --
Wet Chem: --

9 Comments:

Method 8310: — HPLC Method
The terphenyl surrogate recovery exceeded acceptability limits due to interference from non-target analytes. However, as no targets eluting in this region were detected in the samples, data is not deemed adversely impacted.

The spiked sample (060827-01) contained target analytes at concentrations much higher than the spike added levels. The Laboratory Control Sample (LCS) has been provided to demonstrate instrument and solution control. The data is not impacted.

GTEL ENVIRONMENTAL LABORATORIES, INC.

APPENDIX E

CHAIN - OF - CUSTODY FORMS

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

51615

Company Name: GTI Schenectady

Phone #:

FAX #:

Company Address:

Site location: Buffalo

Project Manager: Bruce Ahrens

Client Project ID: (#) 01110 5707 6309

(NAME) Osmose Phase II

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-15 18-20'	11	3		X								X			12/3	11:30
"		2		X								X				↓
MW-16 6-7'	12	3		X								X				1:30
"		2		X								X				
MW-16 7-8'	13	3		X								X				
"		2		X								X				
MW-16 18-20'	14	3		X								X				2:45
"		2		X								X				↓
MW-20 6-7'	15	3		X								X			12/4	9:45
"		2		X								X			↓	↓

Analysis	Containers
BTEX/602 ☐ 8020 ☐ with MTBE ☐	
BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	
Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	
Hydrocarbon Profile (SIMDIS) ☐	
Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	
TPH/IR 418.1 ☐ SM 503 ☐	
EDB by 504 ☐ DBCP by 504 ☐	
EPA 503.1 ☐ EPA 502.2 ☐	
EPA 601 ☐ EPA 8010 ☐	
EPA 602 ☐ EPA 8020 ☒	X
EPA 608 ☐ 8080 ☐ PCB only ☐	
EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	
EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	
EPA 610 ☐ 8310 ☒	X
EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	
TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	
EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	
CAM Metals TTLC ☐ STLC ☐	
Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	
Organic Lead ☐	
Corrosivity ☐ Flash Point ☐ Reactivity ☐	

TAT

Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐
Project-specific

Special Handling

GTEL Contact ____
Quote/Contract # QM920306
Confirmation # ____
PO # ____

SPECIAL DETECTION LIMITS

REMARKS

SPECIAL REPORTING REQUIREMENTS

QA / QC LEVEL

BLUE ☒ CLP ☐
OTHER ____

FAX ☐

Lab Use Only Lot #

Storage Location: W2C

Work Order #

CUSTODY RECORD

Relinquished by Sampler:	Date	Time	Received by:
J. Olaf Gustafson	12/4/92	7:00	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory: Gary McMullen
	12/5/92	12:30	Waybill # 4587 4826 654

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

51614

Company Name: GTI Schenectady
Phone #:
FAX #:
Company Address:
Site location: Buffalo
Project Manager: Bruce Ahrens
Client Project ID: (#) 011105307 6309
(NAME) Osmose Phase II
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-17 2-4'	06	3		X								X			12/2	11:15
"		2		X								X				↓
MW-17 8-10'	07	3		X								X				12:00
"		2		X								X				↓
MW-17 18-20'	08	3		X								X				1:00
"		2		X								X			↓	↓
MW-15 6-8'	09	3		X								X			12/3	10:00
"		2		X								X				↓
MW-15 8-10'	10	3		X								X				10:15
"		2		X								X			↓	↓

Analysis requested (BTEX/602 ☐ 8020 ☐ with MTBE ☐; BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐; Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐; Hydrocarbon Profile (SIMDIS) ☐; Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐; TPH/IR 418.1 ☐ SM 503 ☐; EDB by 504 ☐ DBCP by 504 ☐; EPA 503.1 ☐ EPA 502.2 ☐; EPA 601 ☐ EPA 8010 ☐; EPA 602 ☐ EPA 8020 ☒; EPA 608 ☐ 8080 ☐ PCB only ☐; EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐; EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐; EPA 610 ☐ 8310 ☒; EP TOX Metals ☐ Pesticides ☐ Herbicides ☐; TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐; EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐; CAM Metals TTLC ☐ STLC ☐; Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐; Organic Lead ☐; Corrosivity ☐ Flash Point ☐ Reactivity ☐)

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐
Project-specific

Special Handling
GTEL Contact ____
Quote/Contract # RM920306
Confirmation # ____
PO # ____

QA / QC LEVEL
BLUE ☒ CLP ☐
OTHER ____

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS

Lab Use Only Lot #
Storage Location: W2C
Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	12/4/92	7:00	Received by:
Relinquished by:			Received by:
Relinquished by:	12/5/92	11:45	Received by Laboratory: Amy M Radley

Waybill # 4781810177 00

rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

47576

Company Name: GTI Schenectady
Phone #:
FAX #:
Company Address:
Site location: Buffalo

Project Manager: Bruce Ahrens
Client Project ID: (#) 01110 5307 6309
(NAME) Osmose Phase II

I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-20 7-8'	01	3		X								X			12/4	9:45
"		2		X								X				↓
MW-20 18-20'	02	3		X								X				10:30
"		2		X								X				↓
MW-21 6-7'	03	3		X								X				12:30
"		2		X								X				↓
MW-21 7-8'	04	3		X								X				
"		2		X								X				↓
MW-21 18-20'	05	3		X								X				1:15
"		2		X								X				↓

ANALYSIS REQUEST

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
									X				X						
									X				X						
									X				X						
									X				X						
									X				X						
									X				X						
									X				X						
									X				X						

TAT
- Priority (24 hr) ☐
- Expedited (48 hr) ☐
- 7 Business Days ☐
- Other ____
- Business Days ☐

Special Handling
GTEL Contact ____
Quote/Contract # QM 920306
Confirmation # ____
PO # ____

SPECIAL DETECTION LIMITS

REMARKS

Project-specific
BLUE ☒ CLP ☐
QA / QC LEVEL
OTHER ____

SPECIAL REPORTING REQUIREMENTS
FAX ☐

Lab Use Only Lot #
Storage Location: W2C
Work Order #

CUSTODY RECORD

Relinquished by Sampler:	Date	Time	Received by:
J. Olaf Gustafson	12/4/92	7:00	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory: Greg McRadley
	12/5/92	1230	Waybill # 458748266 4

rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

51627

Company Name: GTI Albany
Phone #:
FAX #:
Company Address:
Site location: Buffalo
Project Manager: Bruce Ahrens
Client Project ID: (#) 01110530C 650339
(NAME) Osmose Ozone
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
Mf-4	1	1		X											11/16	2:30
Mf-3	2	2		X											11/18	1:30
Mf-2	3	2		X											11/18	2:30
Mf-1	4	2		X											11/18	3:15
Mf-3	5	3		X											11/18	1:30

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
													X							
													X							
													X							
													X							
									X											

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
Business Days ☐
Other ☐
Business Days ☐
Project-Specific
BLUE ☒ CLP ☐

Special Handling
GTEL Contact
Quote/Contract # QM920306
Confirmation #
PO #
QA / QC LEVEL
OTHER

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS

Lab Use Only Lot #
Storage Location: NJRE
Work Order #

CUSTODY RECORD

	Date	Time
Relinquished by Sampler: J. Olaf Gustafson	11/19/92	6:00
Relinquished by:		
Relinquished by:	11/20/92	12:00

Received by:
Received by:
Received by Laboratory: Jean A. Ford
Waybill # 479 2217 810

v. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

47174

Company Name: G.T.I. Albany
Phone #:
FAX #:
Company Address:
Site location: Buffalo, NY
Project Manager: Bruce Ahrens
Client Project ID: (#) 011105307 6309
(NAME) Osmose Phase II
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-18 2-4'	1	3		X											11/17	12:00
"		2		X												12:00
MW-18 39-41'	2	1		X												3:00
"		1		X												3:00
MW-18 57-58'	3	3		X												4:45
"		2		X												4:45

Field Sample ID	BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
MW-18 2-4'										X										
"														X						
MW-18 39-41'										X										
"														X						
MW-18 57-58'										X										
"														X						

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐
Project-Specific
BLUE ☒ CLP ☐

Special Handling
GTEL Contact ____
Quote/Contract # QM920306
Confirmation # ____
PO # ____

QA / QC LEVEL
OTHER ____

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS

Lab Use Only Lot #
Storage Location: WRE
Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	11/19/92	6:00	Received by:
Relinquished by			Received by:
Relinquished by:	11/20/92	13:00	Received by Laboratory: Diane M. Ford 478 16×17 840

Waybill # 527 [illegible] 1751 | 12/20/92

ev. 7/9[illegible]

GTEL ENVIRONMENTAL LABORATORIES, INC.
MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

MOBIL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

05182

Company Name: GTI Albany
Phone #:
FAX #:
Company Address:
Site location: (City, State) Buffalo, NY
Project Manager: Bruce Ahrens
Client Project ID: (#) 01113 5307
(NAME) Osmose Phase II
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
IP-1		1		X								X			11/19	9:00
IP-1		3		X								X				9:00
MW-19 2-4'		3		X								X				11:00
"		2		X								X				11:00
MW-19 54-55'		3		X								X				4:00
"		2		X								X				4:00
DUP-2		1		X								X			11/20	12:30
DUP-2		2		X								X				12:30

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
									X											
									X											
									X											
									X											
									X											

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐

Special Handling
QM920306
GTEL Contact ____
Confirmation # ____
THIS DOCUMENT SERVES AS AN AUTHORIZATION TO CONDUCT THE ABOVE OUTLINED TESTS IN ACCORDANCE WITH MOBIL CONTRACT # UC90-0619 DATED APRIL 15, 1990.

SPECIAL DETECTION LIMITS

REMARKS
MOBIL ENV. ENG.:
MOBIL SSN:

SPECIAL REPORTING REQUIREMENTS

Lab Use Only Lot #
Storage Location: 9WC

Project specific
QA / QC LEVEL
BLUE ☒ CLP ☐
OTHER ____

FAX ☐

Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	11/20/92	4:00	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	11/21/92	16:00	Received by Laboratory: Mark Blm

Waybill # 477868178 51

Rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.
MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

MOBIL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST 05182

Company Name: GTI Albany
Phone #:
FAX #:
Company Address:
Site location: (City, State) Buffalo, NY

Project Manager: Bruce Ahrens
Client Project ID: (#) 01105307
(NAME) Osmose Phase II

I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
IP-1		1		X								X			11/19	9:00
IP-1		3		X								X				9:00
MW-19 2-4'		3		X								X				11:00
"		2		X								X				11:00
MW-19 54-55'		3		X								X				4:00
"		2		X								X			↓	4:00
DUP-2		1		X								X			11/20	12:30
DUP-2		2		X								X			↓	12:30

ANALYSIS REQUEST

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER
														X							
								X													
								X													
														X							
								X													
														X							
								X													
														X							

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐

Special Handling
QM920306
GTEL Contact ____
Confirmation # ____
THIS DOCUMENT SERVES AS AN AUTHORIZATION TO CONDUCT THE ABOVE OUTLINED TESTS IN ACCORDANCE WITH MOBIL CONTRACT # UC90-0619 DATED APRIL 15, 1990.

SPECIAL DETECTION LIMITS

REMARKS
MOBIL ENV. ENG.:
MOBIL SSN:

SPECIAL REPORTING REQUIREMENTS

Lab Use Only Lot #
Storage Location: 9WC

Project specific
QA / QC LEVEL
BLUE ☒ CLP ☐
OTHER ____

FAX ☐

Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	11/20/92	4:00	Received by:
Relinquished by:			Received by:
Relinquished by:	11/21/92	16:00	Received by Laboratory:

Waybill # 478681785 1

Rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.
MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

~~MOBIL~~

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

05181

Company Name: GTI Albany
Phone #:
FAX #:
Company Address:
Site location: (City, State) Buffalo, NY
Project Manager: Bruce Ahrens
Client Project ID: (#) 01110530 7 6309
(NAME) Osmose
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
Field Blank		2	X									X			11/20	11:00
Field Blank		3	X						X			X				11:00
Equip Blank		2	X									X				11:15
Equip Blank		3	X						X			X				11:15
Trip Blank		2	X													

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☒ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☒ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☒ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
									X				X							
									X											
									X				X							
									X											

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ☐
Business Days ☐

Special Handling
QM 920306
GTEL Contact
Confirmation #
THIS DOCUMENT SERVES AS AN AUTHORIZATION TO CONDUCT THE ABOVE OUTLINED TESTS IN ACCORDANCE WITH MOBIL CONTRACT # UC90-0619 DATED APRIL 15, 1990.

SPECIAL DETECTION LIMITS

REMARKS
MOBIL ENV. ENG.:
MOBIL SSN:

SPECIAL REPORTING REQUIREMENTS

Lab Use Only Lot #
Storage Location: 21-4P
4WC

Project specific
QA / QC LEVEL
BLUE ☒ CLP ☐
OTHER
FAX ☐
Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	11/20/92	4:00	Received by:
Relinquished by:			Received by:
Relinquished by:	11/21/92	16:00	Received by Laboratory: Mam Blm

Waybill # 472868178S1

Rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.
MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

MOBIL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST 05181

Company Name: LTI Albany
Phone #:
FAX #:
Company Address:
Site location: (City, State) Buffalo, NY
Project Manager: Bruce Ahrens
Client Project ID: (#) 01105307 6309
(NAME) Osmose
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
Field Blank		2	X									X			11/20	11:00
Field Blank		3	X						X			X				11:00
Equip Blank		2	X									X				11:15
Equip Blank		3	X						X			X				11:15
Trip Blank		2	X													

ANALYSIS REQUEST

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☒ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☒ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER
												X									
												X									
												X									
												X									
												X									

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐

Special Handling
QM 920306
GTEL Contact ____
Confirmation # ____
THIS DOCUMENT SERVES AS AN AUTHORIZATION TO CONDUCT THE ABOVE OUTLINED TESTS IN ACCORDANCE WITH MOBIL CONTRACT # UC90-0619 DATED APRIL 15, 1990.

SPECIAL DETECTION LIMITS

REMARKS
MOBIL ENV. ENG.:
MOBIL SSN:

SPECIAL REPORTING REQUIREMENTS

Lab Use Only Lot # Storage Location: 21-4D 4WC

Project Specific
QA / QC LEVEL
BLUE ☒ CLP ☐ OTHER ____
FAX ☐

Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	11/20/92	4:00	Received by:
Relinquished by:			Received by:
Relinquished by:	11/21/92	16:00	Received by Laboratory: Mam Kln

Waybill # 478678117851

Rev. 2/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST 51833

Company Name: G.I.T.
Phone #: 518-370-5831
FAX #:
Company Address: 1245 KINGS ROAD SCHENECTADY, NY
Site location: Buffalo, NY
Project Manager: Bruce Ahrens
Client Project ID: (#)
(NAME) OSMOSE Wood Preserving
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J Vautour

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME	BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☐	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER
Trip Blank		2	X												11/12/92	13:00												X								
Field Blank		5	X																									X								PAH by 8270

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ☐
Business Days ☐

Special Handling
GTEL Contact: D. WAGNER
Quote/Contract #: QM920306
Confirmation #:
PO #:

QA / QC LEVEL
BLUE ☒ CLP ☐
OTHER

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS

Lab Use Only Lot #
Storage Location:
Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J Vautour	11/12/92	13:10	Received by:
Relinquished by:			Received by:
Relinquished by:	11/21/92	10:00	Received by Laboratory:

Waybill #

rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

54148

Company Name: GTI Schenectady
Phone #:
FAX #:
Company Address:
Site location: Buffalo, NY
Project Manager: Bruce Ahrens
Client Project ID: (#) 011105307 6309
(NAME) Osmose Phase II
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-23 18-20'		3		X								X			2/17	10:45
"		2		X								X				↓
MW-26 8-10'		3		X								X				2:00
"		2		X								X				↓
MW-24 10-12'		3		X								X				2:15
"		2		X								X				↓
MW-26 18-20'		3		X								X				3:15
"		2		X								X				↓

ANALYSIS REQUEST — OTHER:

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
									X				X							
									X				X							
									X				X							
									X				X							
									X				X							

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ☐
Business Days ☐

Special Handling
GTEL Contact: Brian Wagner
Quote/Contract #: QM#270306
Confirmation #:
PO #:

SPECIAL DETECTION LIMITS

REMARKS

SPECIAL REPORTING REQUIREMENTS

QA / QC LEVEL
Project - Specific
BLOE ☒ CLP ☐ OTHER
FAX ☐

Lab Use Only Lot # Storage Location:
Work Order #

CUSTODY RECORD

	Date	Time
Relinquished by Sampler:	1/17/93	4:00
Relinquished by:		
Relinquished by:		

Received by:
Received by:
Received by Laboratory:
Waybill #

rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

[illegible] MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST 54147

Company Name: GTI Schenectady
Phone #:
FAX #:
Company Address:
Site location: Buffalo, NY
Project Manager: Bruce Ahrens
Client Project ID: (#) 01105307 6309
(NAME) Osmose Phase II
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
[illegible]-24 8-10'		3		X								X			2/16	11:30
"		2		X								X				↓
[illegible]-24 10-12'		3		X								X				11:45
"		2		X								X				↓
[illegible]-24 18-20'		3		X								X				1:30
"		2		X								X				↓
[illegible]-23 6-8'		3		X								X			2/17	9:30
"		2		X								X				↓
[illegible]-23 16-18'		3		X								X				10:30
"		2		X								X				↓

ANALYSIS REQUEST

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER
									X							X				
									X							X				
									X							X				
									X							X				
									X							X				
									X							X				

TAT
- Priority (24 hr) ☐
- Expedited (48 hr) ☐
- [illegible] Business Days ☐
- Other ____
- Business Days ☐

Special Handling
GTEL Contact: Brian Wagner
Quote/Contract #: QR491306
Confirmation #:
PO #:

QA / QC LEVEL
Project-Specific
BLUE ☒ CLP ☐
OTHER ____

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS

Lab Use Only Lot #
Storage Location:
Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: Bruce Ahrens	2/18	4:00	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:

Waybill #

rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

IEAL ...BRC...NDL...IAL ...K
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

52718

Company Name: GTI

Phone #: (518) 370-5631

FAX #: (518) 370-5864

Company Address: 1245 KINGS ROAD SCHENECTADY, NY

Site location: BUFFALO, NY

Project Manager: BRUCE AHRENS

Client Project ID: (#) 00530-0109

(NAME) OSMOSE WOOD PRESERVING

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): BRIAN CAREY

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
Old ID / New ID*																
SS-1 SS-4	1	2		2								X			6/29	10:00
SS-2 SS-5	2	2		2								X			6/29	10:10
SS-3 SS-6	3	2		2								X			6/29	10:20
SS-4 SS-7	4	2		2								X			6/29	10:30
SS-5 SS-8	5	2		2								X			6/29	10:40
SS-6 SS-9	6	2		2								X			6/29	10:50
	7															
	8															

Analysis	# Containers
BTEX/602 ☐ 8020 ☐ with MTBE ☐	
BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	
Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	
Hydrocarbon Profile (SIMDIS) ☐	
Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	
TPH/IR 418.1 ☐ SM 503 ☐	
EDB by 504 ☐ DBCP by 504 ☐	
EPA 503.1 ☐ EPA 502.2 ☐	
EPA 601 ☐ EPA 8010 ☐	
EPA 602 ☐ EPA 8020 ☐	
EPA 608 ☐ 8080 ☐ PCB only ☐	
EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	
EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	
EPA 610 ☐ 8310 ☐	EPA 8310
EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	2
TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	2
EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	2
CAM Metals TTLC ☐ STLC ☐	2
Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	2
Organic Lead ☐	
Corrosivity ☐ Flash Point ☐ Reactivity ☐	

* New ID #s were assigned to avoid confusion with previous samples (Jobs)

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐

Special Handling
GTEL Contact: ____
Quote/Contract #: ____
Confirmation #: ____
PO #: ____

QA / QC LEVEL
BLUE ☐ CLP ☐ OTHER ____

SPECIAL DETECTION LIMITS
PROJECT-SPECIFIC BLUE-LEVEL QA/QC

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS
THIS IS AN R&D JOB NUMBER

Lab Use Only Lot #

Storage Location: W3A

Work Order #

CUSTODY RECORD

	Date	Time
Relinquished by Sampler:	6/29/93	13:00
Relinquished by:		
Relinquished by:	6/30/93	12:35

Received by:

Received by:

Received by Laboratory:

Waybill #

rev. 7/91

GTEL
ENVIRONMENTAL
LABORATORIES, INC.
Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

RECEIVED
DEC 30 1992

December 28, 1992

Bruce Ahrens
Groundwater Technology, Inc.
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 12/05/92 under chain-of-custody records 47576, 51614 and 51615.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number 10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Susan C. Uhler
Laboratory Director

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

CONFORMANCE/NONCONFORMANCE SUMMARY

(X = Requirements Met * = See Comments NA = Not Applicable)

#	Conformance Item	VOA GC	VOA GC/MS	SV GC	SV GC/MS	Metals	Wet Chem
1	GC/MS Tune	NA	--	NA	--	NA	NA
2	Initial Calibration	X	--	X	--	--	--
3	Continuing Calibration	X	--	X	--	--	--
4	Surrogate Recovery	X	--	*	--	NA	NA
5	Holding Time	X	--	X	--	--	--
6	Method Accuracy	X	--	X	--	--	--
7	Method Precision	X	--	X	--	--	--

8 Blank Contamination - List/ND (None Detected)/*(See Comments)

VOA: ND
SV: ND
Metals: --
Wet Chem: --

9 Comments: **Method 8310:**
The surrogate recovery limits were exceeded for one compound in two samples due to sample specific matrix effect. The flagged data should be considered the maximum concentration of analyte present in the sample.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil - Low Level
Modified EPA Method 8020[a]

GTEL Sample Number		120177-04	120177-05	--	--
Client Identification		MW-21 7-8'	MW-21 18-20'	--	--
Date Sampled		12/04/92	12/04/92	--	--
Date Analyzed		12/14/92	12/14/92	--	--
Analyte	Detection Limit, ug/kg	Concentration, ug/kg (dry)			
Benzene	1.0	< 2.9	< 3.0	--	--
Toluene	1.7	< 4.9	< 5.1	--	--
Ethylbenzene	1.0	< 2.9	< 3.0	--	--
Xylenes (total)	2.0	< 5.8	< 6.0	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	1.0	< 2.9	< 3.0	--	--
1,2-Dichlorobenzene	1.7	< 4.9	< 5.1	--	--
1,3-Dichlorobenzene	1.7	< 4.9	< 5.1	--	--
1,4-Dichlorobenzene	1.7	< 4.9	< 5.1	--	--
Detection Limit Multiplier[b]		2.90	3.01	--	--
Percent Solids		86.6	82.2	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample prepared by EPA Method 5030. Method modified to include additional compounds. Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

SURROGATE RECOVERY RESULTS

Volatile Organics in Soil - Low Level
(Trifluorotoluene)
EPA Method 8020

Sample	Amount Added, ug/L	Surrogate Recovery, %
BL12149214B	95.2	89.4
120177-05	95.2	108.3
120177-05 MS	95.2	75.2
120177-05 MSD	95.2	104.2
120177-04	95.2	98.3

Acceptability Limits[a] 26-125%

a Laboratory generated acceptability limits updated 05/28/92.
MS Matrix Spike.
MSD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) SUMMARY PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)

Volatile Organics in Soil
EPA Method 8020

Sample Spiked: 120177-05 Client ID: BATCH QC

Date(s) of Analysis: 12/14/92 Standard ID: BX92QC0260

Analyte	Spike Added, ug/kg	Sample Concentration, ug/kg	MS Concentration, ug/kg	MS Percent Recovery	Acceptability Limits, % Rec.[a]
Benzene	60.80	< 3.01	34.13	56	40-160
Toluene	60.80	< 5.12	41.21	68	40-160
Ethylbenzene	60.80	< 3.01	42.46	70	40-160
Total Xylenes	182.39	< 6.02	128.05	70	40-160

Analyte	Spike Added, ug/kg	MSD Concentration, ug/kg	MSD Percent Recovery	RPD, %	Acceptability Limits[a]	
					RPD	% Recovery
Benzene	60.50	47.15	78	33	40	40-160
Toluene	60.50	57.07	94	33	40	40-160
Ethylbenzene	60.50	61.74	102	38	40	40-160
Total Xylenes	181.49	189.29	104	39	40	40-160

* Indicates values outside of acceptability limits.
a Acceptability limits as per laboratory practice.
NA Not Applicable. % Recovery is not calculated when sample results exceed five times the spike concentration.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

METHOD BLANK RESULTS

Aromatic Volatile Organics in Soil - Low Level
Modified EPA Method 8020[a]

GTEL Sample Number		BL12149214B	--	--	--
Client Identification		METHOD BLANK	--	--	--
Date Analyzed		12/14/92	--	--	--
Analyte	Detection Limit, ug/kg	Concentration, ug/kg (dry)			
Benzene	1.0	< 1.0	--	--	--
Toluene	1.7	< 1.7	--	--	--
Ethylbenzene	1.0	< 1.0	--	--	--
Xylenes (total)	2.0	< 2.0	--	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	1.0	< 1.0	--	--	--
1,2-Dichlorobenzene	1.7	< 1.7	--	--	--
1,3-Dichlorobenzene	1.7	< 1.7	--	--	--
1,4-Dichlorobenzene	1.7	< 1.7	--	--	--
Detection Limit Multiplier[b]		1	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample prepared by EPA Method 5030. Method modified to include additional compounds. Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil
Modified EPA Method 8020[a]

GTEL Sample Number		120177-01	120177-02	120177-03	120177-06
Client Identification		MW-20 7-8'	MW-20 18-20'	MW-21 6-7'	MW-17 2-4'
Date Sampled		12/04/92	12/04/92	12/04/92	12/02/92
Date Analyzed		12/08/92	12/08/92	12/08/92	12/09/92
Analyte	Detection Limit, mg/kg	Concentration, mg/kg (dry)			
Benzene	0.12	< 0.14	< 0.14	< 0.15	< 0.15
Toluene	0.31	< 0.36	< 0.36	< 0.38	< 0.40
Ethylbenzene	0.50	< 0.58	< 0.59	< 0.61	< 0.64
Xylenes (total)	1.1	< 1.3	< 1.3	< 1.3	< 1.4
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.12	< 0.14	< 0.14	< 0.15	< 0.14
1,2-Dichlorobenzene	0.25	< 0.29	< 0.29	< 0.30	< 0.29
1,3-Dichlorobenzene	0.25	< 0.29	< 0.29	< 0.30	< 0.29
1,4-Dichlorobenzene	0.25	< 0.29	< 0.29	< 0.30	< 0.29
Detection Limit Multiplier[b]		1.17[c]	1.17[c]	1.21[c]	1.28[c]
Percent Solids		85.3	84.6	82.0	78.3

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Methanolic extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

c Sample was not analyzed low level due to the interference of non-target compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil
Modified EPA Method 8020[a]

GTEL Sample Number		120177-07	120177-08	120177-09	120177-10
Client Identification		MW-17 8-10'	MW-17 18-20'	MW-15 6-8'	MW-15 8-10'
Date Sampled		12/02/92	12/02/92	12/03/92	12/03/92
Date Analyzed		12/08/92	12/08/92	12/08/92	12/08/92
Analyte	Detection Limit, mg/kg	Concentration, mg/kg (dry)			
Benzene	0.12	< 0.14	< 0.14	< 0.14	< 0.14
Toluene	0.31	**0.36**	< 0.37	< 0.36	< 0.36
Ethylbenzene	0.50	< 0.58	< 0.59	< 0.58	< 0.57
Xylenes (total)	1.1	**5.4**	< 1.3	< 1.3	**2.1**
BTEX (total)	--	**5.8**	--	--	**2.1**
Chlorobenzene	0.12	< 0.14	< 0.14	< 0.14	< 0.14
1,2-Dichlorobenzene	0.25	< 0.29	< 0.29	< 0.29	< 0.29
1,3-Dichlorobenzene	0.25	< 0.29	< 0.29	< 0.29	< 0.29
1,4-Dichlorobenzene	0.25	< 0.29	< 0.29	< 0.29	< 0.29
Detection Limit Multiplier[b]		1.15	1.19[c]	1.16[c]	1.15
Percent Solids		86.6	83.9	86.2	87.2

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Methanolic extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

c Sample was not analyzed low level due to the interference of non-target compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil
Modified EPA Method 8020[a]

GTEL Sample Number		120177-11	120177-12	120177-13	120177-14
Client Identification		MW-15 18-20'	MW-16 6-7'	MW-16 7-8'	MW-16 18-20'
Date Sampled		12/03/92	12/03/92	12/03/92	12/03/92
Date Analyzed		12/08/92	12/08/92	12/08/92	12/08/92
Analyte	Detection Limit, mg/kg	Concentration, mg/kg (dry)			
Benzene	0.12	< 0.14	< 0.14	< 0.14	< 0.14
Toluene	0.31	< 0.36	< 0.37	< 0.36	< 0.37
Ethylbenzene	0.50	< 0.58	< 0.60	< 0.58	< 0.59
Xylenes (total)	1.1	< 1.3	**1.6**	**9.1**	< 1.3
BTEX (total)	--	--	**1.6**	**9.1**	--
Chlorobenzene	0.12	< 0.14	< 0.14	< 0.14	< 0.14
1,2-Dichlorobenzene	0.25	< 0.29	< 0.30	< 0.29	< 0.30
1,3-Dichlorobenzene	0.25	< 0.29	< 0.30	< 0.29	< 0.30
1,4-Dichlorobenzene	0.25	< 0.29	< 0.30	< 0.29	< 0.30
Detection Limit Multiplier[b]		1.16[c]	1.20	1.15	1.19[c]
Percent Solids		86.5	83.4	86.7	84.4

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Methanolic extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

c Sample was not analyzed low level due to the interference of non-target compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil
Modified EPA Method 8020[a]

GTEL Sample Number		120177-15	--	--	--
Client Identification		MW-20 6-7'	--	--	--
Date Sampled		12/04/92	--	--	--
Date Analyzed		12/08/92	--	--	--
Analyte	Detection Limit, mg/kg	Concentration, mg/kg (dry)			
Benzene	0.12	< 0.14	--	--	--
Toluene	0.31	< 0.37	--	--	--
Ethylbenzene	0.50	< 0.60	--	--	--
Xylenes (total)	1.1	< 1.3	--	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.12	< 0.14	--	--	--
1,2-Dichlorobenzene	0.25	< 0.30	--	--	--
1,3-Dichlorobenzene	0.25	< 0.30	--	--	--
1,4-Dichlorobenzene	0.25	< 0.30	--	--	--
Detection Limit Multiplier[b]		1.20[c]	--	--	--
Percent Solids		83.0	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Methanolic extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

c Sample was not analyzed low level due to the interference of non-target compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

SURROGATE RECOVERY RESULTS

Volatile Organics in Soil
(Trifluorotoluene)
EPA Method 8020

Sample	Amount Added, ug/L	Surrogate Recovery, %
BS12079220A	95.2	69.5
120177-12	95.2	68.6
120177-12 MS	95.2	70.6
120177-12 MSD	95.2	69.2
120177-01	95.2	67.5
120177-02	95.2	68.2
120177-03	95.2	68.3
120177-07	95.2	65.0
120177-08	95.2	65.5
120177-09	95.2	66.3
120177-10	95.2	65.7
120177-11	95.2	65.0
120177-13	95.2	64.9
120177-14	95.2	64.6
120177-15	95.2	64.4
120177-12	95.2	83.5
120177-06	95.2	77.5

Acceptability Limits[a] 26-125%

a Laboratory generated acceptability limits updated 05/28/92.
MS Matrix Spike.
MSD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) SUMMARY
PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)

Volatile Organics in Soil
EPA Method 8020

Sample Spiked: 120177-12 Client ID: BATCH QC

Date(s) of Analysis: 12/08/92 Standard ID: BX92QC0289

Analyte	Spike Added, mg/kg	Sample Concentration, mg/kg	MS Concentration, mg/kg	MS Percent Recovery	Acceptability Limits, % Rec.[a]
Benzene	58.22	< 0.14	63.13	108	40-160
Toluene	62.48	< 0.37	65.51	105	40-160
Ethylbenzene	62.59	< 0.60	72.16	115	40-160
Total Xylenes	188.60	1.65	220.44	116	40-160

Analyte	Spike Added, mg/kg	MSD Concentration, mg/kg	MSD Percent Recovery	RPD, %	Acceptability Limits[a]	
					RPD	% Recovery
Benzene	57.64	60.72	105	3	40	40-160
Toluene	61.85	63.71	102	2	40	40-160
Ethylbenzene	61.97	70.93	114	2	40	40-160
Total Xylenes	186.73	218.06	116	0	40	40-160

* Indicates values outside of acceptability limits.
a Acceptability limits as per laboratory practice.
NA Not Applicable. % Recovery is not calculated when sample results exceed five times the spike concentration.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

METHOD BLANK RESULTS

Aromatic Volatile Organics in Soil
Modified EPA Method 8020[a]

GTEL Sample Number		BS12079220A	--	--	--
Client Identification		METHOD BLANK	--	--	--
Date Analyzed		12/08/92	--	--	--
Analyte	Detection Limit, mg/kg	Concentration, mg/kg (dry)			
Benzene	0.12	< 0.12	--	--	--
Toluene	0.31	< 0.31	--	--	--
Ethylbenzene	0.50	< 0.50	--	--	--
Xylenes (total)	1.1	< 1.1	--	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.12	< 0.12	--	--	--
1,2-Dichlorobenzene	0.25	< 0.25	--	--	--
1,3-Dichlorobenzene	0.25	< 0.25	--	--	--
1,4-Dichlorobenzene	0.25	< 0.25	--	--	--
Methyl tert-Butyl Ether	0.50	< 0.50	--	--	--
Detection Limit Multiplier[b]		1	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Methanolic extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		120177-01	120177-02	120177-03	120177-04
Client Identification		MW-20 7-8'	MW-20 18-20'	MW-21 6-7'	MW-21 7-8'
Date Sampled		12/04/92	12/04/92	12/04/92	12/04/92
Date Extracted		12/09/92	12/09/92	12/09/92	12/09/92
Date Analyzed		12/16/92	12/16/92	12/16/92	12/16/92
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	< 71	< 71	< 72	< 68
Acenaphthylene	77	< 91	< 91	< 92	< 88
1-Methylnaphthalene	60	< 71	< 71	< 72	< 68
2-Methylnaphthalene	60	< 71	< 71	< 72	< 68
Acenaphthene	60	< 71	< 71	< 72	< 68
Fluorene	7.0	< 8.3	< 8.3	< 8.4	< 8.0
Phenanthrene	21	< 25	< 25	< 25	< 24
Anthracene	22	< 26	< 26	< 26	< 25
Fluoranthene	7.0	< 8.3	< 8.3	< 8.4	< 8.0
Pyrene	9.0	< 11	< 11	< 11	< 10
Benzo[*a*]anthracene	0.43	< 0.51	< 0.51	**0.81**	< 0.49
Chrysene	5.0	< 5.9	< 5.9	< 6.0	< 5.7
Benzo[*b*]fluoranthene	0.60	< 0.71	< 0.71	**1.4**	**0.84**
Benzo[*k*]fluoranthene	0.57	< 0.67	< 0.67	**0.75**	0.65
Benzo[*a*]pyrene	0.77	< 0.91	< 0.91	**1.1**	< 0.88
Dibenzo[*a,h*]anthracene	1.0	< 1.2	< 1.2	< 1.2	< 1.1
Benzo[*g,h,i*]perylene	2.5	< 3.0	< 3.0	< 3.0	< 2.8
Indeno[1,2,3-*cd*]pyrene	1.4	< 1.7	< 1.7	< 1.7	< 1.6
Detection Limit Multiplier[b]		1.18	1.18	1.20	1.14
Percent Solids, %		85.3	84.6	82.0	86.6

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		120177-05	120177-06	120177-07	120177-08
Client Identification		MW-21 18-20'	MW-17 2-4'	MW-17 8-10'	MW-17 18-20'
Date Sampled		12/04/92	12/02/92	12/02/92	12/02/92
Date Extracted		12/09/92	12/09/92	12/09/92	12/09/92
Date Analyzed		12/16/92	12/16/92	12/16/92[c]	12/16/92
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	< 71	< 77	68000[c]	1200
Acenaphthylene	77	< 92	< 99	< 1800	< 92
1-Methylnaphthalene	60	< 71	< 77	8500	< 71
2-Methylnaphthalene	60	< 71	< 77	69000	190
Acenaphthene	60	< 71	< 77	25000	< 71
Fluorene	7.0	< 8.3	< 9.0	20000[c]	48
Phenanthrene	21	< 25	< 27	100000[c] X	110
Anthracene	22	< 26	< 28	8500[c] X	35
Fluoranthene	7.0	< 8.3	< 9.0	30000[c] X	48
Pyrene	9.0	< 11	< 12	53000[c] X	37
Benzo[a]anthracene	0.43	2.2	1.0	3100 X	6.7
Chrysene	5.0	< 6.0	< 6.4	4400 X	11
Benzo[*b*]fluoranthene	0.60	2.5	2.2	1200 X	2.7
Benzo[*k*]fluoranthene	0.57	1.1	< 0.73	580 X	1.5
Benzo[a]pyrene	0.77	1.9	< 0.99	1000 X	2.3
Dibenzo[*a,h*]anthracene	1.0	< 1.2	< 1.3	45 X	< 1.2
Benzo[*g,h,i*]perylene	2.5	< 3.0	< 3.2	340 X	< 3.0
Indeno[1,2,3-*cd*]pyrene	1.4	2.0	2.2	280 X	< 1.7
Detection Limit Multiplier[b]		1.19	1.28	23.2[c]	1.19
Percent Solids, %		82.2	78.3	86.6	83.9

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.
b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.
c Detection Limit Multiplier for analyte noted = 464; Date analyzed = 12/17/92.
X Estimated concentration. Surrogate recovery demonstrated sample specific matrix effect.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		120177-09	120177-10	120177-11	120177-12
Client Identification		MW-15 6-8'	MW-15 8-10'	MW-15 18-20'	MW-16 6-7'
Date Sampled		12/03/92	12/03/92	12/03/92	12/03/92
Date Extracted		12/09/92	12/09/92	12/09/92	12/09/92
Date Analyzed		12/16/92[d]	12/16/92[e]	12/16/92	12/16/92[f]
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	2600[d]	10000[e]	< 70	4800[f]
Acenaphthylene	77	< 89	180	< 89	130
1-Methylnaphthalene	60	990	1800	< 70	1200
2-Methylnaphthalene	60	8400[d]	17000[e]	< 70	10000[f]
Acenaphthene	60	3000	6300[e]	< 70	3200[f]
Fluorene	7.0	2600[d]	4800[e]	< 8.1	2800[f]
Phenanthrene	21	17000[d]	23000[e]	< 24	14000[f]
Anthracene	22	2100[d]	2200[e]	< 26	850[f]
Fluoranthene	7.0	5700[d]	6800[e]	< 8.1	3500[f]
Pyrene	9.0	11000[d]	11000[e]	< 10	3300[f]
Benzo[*a*]anthracene	0.43	< 0.49	1300[e]	0.72	540[f]
Chrysene	5.0	< 5.8	1800[e]	< 5.8	850[f]
Benzo[*b*]fluoranthene	0.60	270	270	0.81	140
Benzo[*k*]fluoranthene	0.57	120	130	< 0.66	67
Benzo[*a*]pyrene	0.77	220	240	< 0.89	120
Dibenzo[*a,h*]anthracene	1.0	9.0	8.9	< 1.2	4.8
Benzo[*g,h,i*]perylene	2.5	51	66	< 2.9	35
Indeno[1,2,3-*cd*]pyrene	1.4	59	61	< 1.6	26
Detection Limit Multiplier[b]		1.15[d]	1.15[e]	1.16	1.20[f]
Percent Solids, %		86.2	87.2	86.5	83.4

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.
b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.
d Detection Limit Multiplier for analyte noted = 115; Date analyzed = 12/17/92.
e Detection Limit Multiplier for analyte noted = 115; Date analyzed = 12/17/92.
f Detection Limit Multiplier for analyte noted = 120; Date analyzed = 12/17/92.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		120177-13	120177-14	120177-15	--
Client Identification		MW-16 7-8'	MW-16 18-20'	MW-20 6-7'	--
Date Sampled		12/03/92	12/03/92	12/04/92	--
Date Extracted		12/09/92	12/09/92	12/09/92	--
Date Analyzed		12/16/92 g,h	12/16/92	12/16/92	--
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	90000[g]	< 70	< 71	--
Acenaphthylene	77	2100	< 90	< 92	--
1-Methylnaphthalene	60	24000	< 70	< 71	--
2-Methylnaphthalene	60	170000[g]	< 70	< 71	--
Acenaphthene	60	61000[g]	< 70	< 71	--
Fluorene	7.0	41000[g]	< 8.2	< 8.3	--
Phenanthrene	21	94000[h] X	< 25	< 25	--
Anthracene	22	15000[g] X	< 26	< 26	--
Fluoranthene	7.0	51000[g] X	13	< 8.3	--
Pyrene	9.0	68000[g] X	< 11	< 11	--
Benzo[a]anthracene	0.43	5400 X	2.0	< 0.51	--
Chrysene	5.0	11000[g] X	< 5.9	7.4	--
Benzo[*b*]fluoranthene	0.60	2100 X	2.8	2.2	--
Benzo[*k*]fluoranthene	0.57	1000 X	1.5	< 0.68	--
Benzo[a]pyrene	0.77	1900 X	2.0	< 0.92	--
Dibenzo[*a,h*]anthracene	1.0	73 X	< 1.2	< 1.2	--
Benzo[*g,h,i*]perylene	2.5	500 X	< 2.9	< 3.0	--
Indeno[1,2,3-*cd*]pyrene	1.4	450 X	< 1.6	< 1.7	--
Detection Limit Multiplier[b]		22.8 g,h	1.17	1.19	--
Percent Solids, %		86.7	84.4	83.0	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.
b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.
g Detection Limit Multiplier for analyte noted = 456; Date analyzed = 12/17/92.
h Detection Limit Multiplier for analyte noted = 912; Date analyzed = 12/18/92.
X Estimated concentration. Surrogate recovery demonstrated sample specific matrix effect.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

SURROGATE RECOVERY SUMMARY

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310

GTEL Sample ID	Percent Recovery, %	
	S1 (NBZ)	S2 (TPH)
BS1209-1	62	83
120177-01	90	97
120177-02	74	86
120177-03	76	80
120177-04	87	91
120177-05	78	82
120177-06	96	91
120177-07 (12/16/92)	121	306*
120177-07 (12/17/92)	D	D
120177-08	77	97
120177-09 (12/16/92)	70	134
120177-09 (12/17/92)	D	D
120177-10 (12/16/92)	69	140
120177-10 (12/17/92)	D	D
120177-11	102	88
120177-12 (12/16/92)	95	100
120177-12 (12/17/92)	D	D
120177-13 (12/16/92)	53	570*
120177-13 (12/17/92)	D	D
120177-13 (12/18/92)	D	D
120177-14	84	83
120177-03 MS	81	83
120177-03 MSD	85	87
120177-15	80	80

Surrogates			Recovery Limits[a]
S1	NBZ	Nitrobenzene-d5	33-141%
S2	TPH	Terphenyl-d14	33-141%

D Surrogate diluted out. % Recovery not calculated when surrogate diluted out.
* Indicates values outside of acceptability limits.
a Recovery limits as per laboratory practice.
MS Matrix Spike.
MSD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

MATRIX SPIKE (MS) / MATRIX SPIKE DUPLICATE (MSD)
PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: 120177-03 Client ID: BATCH QC

Date Analyzed: 12/16/92 Standard ID: H92MS005D

Compound	Spike Added, ug/kg	Sample Concentration, ug/kg	MS Concentration, ug/kg	MS Percent Recovery, %	Acceptability Limits, %
Naphthalene	406	< 72	362	89	D-122
Acenaphthylene	406	< 92.4	346	85	D-139
Fluorene	81.2	< 8.4	67.0	83	D-142
Phenanthrene	40.6	< 25.2	34.9	86	D-155
Anthracene	40.6	< 26.4	34.9	86	D-126
Benzo[*k*]fluoranthene	40.6	0.753	34.5	83	D-159
Indeno[1,2,3-*cd*]pyrene	40.6	< 1.68	32.8	81	D-116

Compound	Spike Added, ug/kg	MSD Concentration, ug/kg	MSD Percent Recovery, %	RPD, %	Acceptability Limits: RPD, %
Naphthalene	403	373	93	4	60
Acenaphthylene	403	346	86	1	60
Fluorene	80.5	67.8	84	2	60
Phenanthrene	40.3	31.5	78	9	60
Anthracene	40.3	27.6	69	23	60
Benzo[*k*]fluoranthene	40.3	34.1	83	0	60
Indeno[1,2,3-*cd*]pyrene	40.3	30.7	76	6	60

* Values outside of QC limits.
D Diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration of sample is more than four times that of spike.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-12-0177

METHOD BLANK RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

	GTEL Blank ID	BS1209-1
	GTEL File ID	BS1209-1
	Date Extracted	12/09/92
	Date Analyzed	12/16/92
Analyte	Detection Limit, ug/kg	Concentration, ug/kg
Naphthalene	60	< 59
Acenaphthylene	77	< 76
1-Methylnaphthalene	60	< 59
2-Methylnaphthalene	60	< 59
Acenaphthene	60	< 59
Fluorene	7.0	< 6.9
Phenanthrene	21	< 21
Anthracene	22	< 22
Fluoranthene	7.0	< 6.9
Pyrene	9.0	< 8.9
Benzo[*a*]anthracene	0.43	< 0.43
Chrysene	5.0	< 4.9
Benzo[*b*]fluoranthene	0.60	< 0.59
Benzo[*k*]fluoranthene	0.57	< 0.56
Benzo[*a*]pyrene	0.77	< 0.76
Dibenzo[*a,h*]anthracene	1.0	< 0.99
Benzo[*g,h,i*]perylene	2.5	< 2.5
Indeno[1,2,3-*cd*]pyrene	1.4	< 1.4
Detection Limit Multiplier		0.989

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.
b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST 47576

Company Name: GTI Schenectady
Company Address:
Phone #:
FAX #:
Site location: Buffalo

Project Manager: Bruce Ahrens
Client Project ID: (#) 01110 5307 6309
(NAME) Osmose Phase II

I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-20 7-8'	01	3		X								X			12/4	9:45
"		2		X								X			↓	↓
MW-20 18-20'	02	3		X								X				10:30
"		2		X								X				↓
MW-21 6-7'	03	3		X								X				12:30
"		2		X								X				↓
MW-21 7-8'	04	3		X								X				↓
"		2		X								X				↓
MW-21 18-20'	05	3		X								X				1:15
"		2		X								X			↓	↓

ANALYSIS REQUEST

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
									X				X						
									X				X						
									X				X						
									X				X						
									X				X						
									X				X						
									X				X						
									X				X						

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐
Project-specific

Special Handling
GTEL Contact ____
Quote/Contract # QM 920306
Confirmation # ____
PO # ____

QA / QC LEVEL
BLUE ☒ CLP ☐
OTHER ____

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS

Lab Use Only Lot #
Storage Location: W2C
Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	12/4/92	7:00	Received by:
Relinquished by:			Received by:
Relinquished by:	12/5/92	1230	Received by Laboratory: Greg McRadeau

Waybill # 458748266 4

Rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST 51614

Company Name: GTI Schenectady
Phone #:
FAX #:
Company Address:
Site location: Buffalo

Project Manager: Bruce Ahrens
Client Project ID: (#) 011105307 6309
(NAME) Osmose Phase II

I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): T. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-17 2-4'	06	3		X								X			12/2	11:15
"		2		X								X				↓
MW-17 8-10'	07	3		X								X				12:00
"		2		X								X				↓
MW-17 18-20'	08	3		X								X				1:00
"		2		X								X			↓	↓
MW-15 6-8'	09	3		X								X			12/3	10:00
"		2		X								X				↓
MW-15 8-10'	10	3		X								X				10:15
"		2		X								X			↓	↓

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
									X			X							
												X							
									X										
												X							
									X										
												X							
									X										
												X							

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ☐
Business Days ☐

Special Handling
GTEL Contact
Quote/Contract # RM920306
Confirmation #
PO #

SPECIAL DETECTION LIMITS

REMARKS

SPECIAL REPORTING REQUIREMENTS

Project-specific
QA / QC LEVEL
BLUE ☒ CLP ☐
OTHER
FAX ☐

Lab Use Only Lot #
Storage Location: W2C
Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: T. Olaf Gustafson	12/4/92	7:00	Received by:
Relinquished by:			Received by:
Relinquished by:	12/5/92	11:45	Received by Laboratory: Guy M Nadeau

Waybill # 474 868 177 00

Rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

51615

Company Name: GTI Schenectady
Phone #:
FAX #:
Company Address:
Site location: Buffalo
Project Manager: Bruce Ahrens
Client Project ID: (#) 01110 5307 6309
(NAME) Osmose Phase II
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-15 18-20'	11	3		X								X			12/3	11:30
"		2		X								X				↓
MW-16 6-7'	12	3		X								X				1:30
"		2		X								X				↓
MW-16 7-8'	13	3		X								X				↓
"		2		X								X				↓
MW-16 18-20'	14	3		X								X				2:45
"		2		X								X			↓	↓
MW-20 6-7'	15	3		X								X			12/4	9:45
"		2		X								X			↓	↓

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
									X										
													X						
									X										
													X						
									X										
													X						
									X										
													X						
									X										
													X						

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ☐
Business Days ☐

Special Handling
GTEL Contact
Quote/Contract # QM920306
Confirmation #
PO #

SPECIAL DETECTION LIMITS

REMARKS

SPECIAL REPORTING REQUIREMENTS

FAX ☐

Lab Use Only Lot #

Storage Location: W2C

Work Order #

project-specific
QA / QC LEVEL
BLUE ☒ CLP ☐
OTHER

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	12/4/92	7:00	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory: Kerry M Nadeau
	12/5/92	12:30	Waybill # 458748266 4

Rev. 7/91

GTEL
ENVIRONMENTAL
LABORATORIES, INC.

Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

RECEIVED
JAN - 5 1993

December 30, 1992

Bruce Ahrens
Groundwater Technology, Inc.
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 11/20/92 and 11/21/92 under chain-of-custody records 05181, 05182, 47174, 51627 and 51833.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number 10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Susan C. Uhler
Laboratory Director

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

CONFORMANCE/NONCONFORMANCE SUMMARY

(X = Requirements Met * = See Comments NA = Not Applicable)

#	Conformance Item	VOA GC	VOA GC/MS	SV HPLC	SV GC/MS	Metals	Wet Chem
1	GC/MS Tune	NA	--	NA	--	NA	NA
2	Initial Calibration	X	--	X	--	--	--
3	Continuing Calibration	X	--	X	--	--	--
4	Surrogate Recovery	X	--	*	--	NA	NA
5	Holding Time	X	--	X	--	--	--
6	Method Accuracy	X	--	X	--	--	--
7	Method Precision	X	--	X	--	--	--

8 Blank Contamination - List/ND (None Detected)/*(See Comments)

VOA:	*
SV:	ND
Metals:	--
Wet Chem:	--

9 Comments:

Method 8020 Medium Level:
Contamination was demonstrated to be isolated to the methanol blank which appears to be carryover from the rinse methanol. The instrument blank (BW11309220B) prepped and analyzed on 11/30/92 support that the instrument and methanol are free of contamination. Data not impacted.

Method 8310:
Percent Recovery limits were exceeded for one surrogate in three samples due to the presence of interfering non-target compounds and high concentrations of target analytes. However, this type of contamination typically impacts this surrogate's recoveries only by contributing and interfering with the peak's integration. Data reported for the targets detected is not believed to be adversely impacted.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil - Low Level
Modified EPA Method 8020[a]

GTEL Sample Number		110512-02	110513-01	110513-02	110513-03
Client Identification		MP-3	MW-18 2-4'	MW-18 39-41'	MW-18 57-58'
Date Sampled		11/18/92	11/17/92	11/17/92	11/17/92
Date Analyzed		12/01/92	12/01/92	12/01/92	12/01/92
Analyte	Detection Limit, ug/kg	Concentration, ug/kg (dry)			
Benzene	1.0	< 1.2	< 3.0	< 2.6	< 2.6
Toluene	1.7	< 2.0	< 5.0	< 4.5	< 4.5
Ethylbenzene	1.0	< 1.2	< 3.0	< 2.6	< 2.6
Xylenes (total)	2.0	< 2.4	< 5.9	< 5.3	< 5.3
BTEX (total)	--	--	--	--	--
Chlorobenzene	1.0	< 1.2	< 3.0	< 2.6	< 2.6
1,2-Dichlorobenzene	1.7	< 2.0	< 5.0	< 4.5	< 4.5
1,3-Dichlorobenzene	1.7	< 2.0	< 5.0	< 4.5	< 4.5
1,4-Dichlorobenzene	1.7	< 2.0	< 5.0	< 4.5	< 4.5
Detection Limit Multiplier[b]		1.20	2.95	2.65	2.64
Percent Solids		82.7	85.1	92.6	92.3

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample prepared by EPA Method 5030. Method modified to include additional compounds. Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil - Low Level
Modified EPA Method 8020[a]

GTEL Sample Number		110552-04	--	--	--
Client Identification		DUP-2	--	--	--
Date Sampled		11/20/92	--	--	--
Date Analyzed		12/01/92	--	--	--
Analyte	Detection Limit, ug/kg	Concentration, ug/kg (dry)			
Benzene	1.0	< 1.2	--	--	--
Toluene	1.7	< 2.0	--	--	--
Ethylbenzene	1.0	< 1.2	--	--	--
Xylenes (total)	2.0	< 2.4	--	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	1.0	< 1.2	--	--	--
1,2-Dichlorobenzene	1.7	< 2.0	--	--	--
1,3-Dichlorobenzene	1.7	< 2.0	--	--	--
1,4-Dichlorobenzene	1.7	< 2.0	--	--	--
Detection Limit Multiplier[b]		1.20	--	--	--
Percent Solids		84.1	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample prepared by EPA Method 5030. Method modified to include additional compounds. Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

SURROGATE RECOVERY RESULTS

Volatile Organics in Soil - Low Level
(Trifluorotoluene)
EPA Method 8020

Sample	Amount Added, ug/L	Surrogate Recovery, %
BS12019214B	95.2	96.7
110552-04 MS	95.2	87.6
110552-04 MSD	95.2	83.7
110513-01	95.2	94.1
110513-02	95.2	107.9
110513-03	95.2	104.0
110552-04	95.2	72.9
110512-02	95.2	86.7

Acceptability Limits[a] 26-125%

a Laboratory generated acceptability limits updated 05/28/92.
MS Matrix Spike.
MSD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) SUMMARY
PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)

Volatile Organics in Soil
EPA Method 8020

Sample Spiked: 110552-04 Client ID: BATCH QC

Date(s) of Analysis: 12/01/92 Standard ID: BX92QC0260

Analyte	Spike Added, ug/kg	Sample Concentration, ug/kg	MS Concentration, ug/kg	MS Percent Recovery	Acceptability Limits, % Rec.[a]
Benzene	23.78	< 1.20	13.58	57	40-160
Toluene	23.78	< 2.04	15.92	67	40-160
Ethylbenzene	23.78	< 1.20	16.31	69	40-160
Total Xylenes	71.35	< 2.40	50.39	71	40-160

Analyte	Spike Added, ug/kg	MSD Concentration, ug/kg	MSD Percent Recovery	RPD, %	Acceptability Limits[a]	
					RPD	% Recovery
Benzene	24.02	13.55	56	1	40	40-160
Toluene	24.02	15.51	65	4	40	40-160
Ethylbenzene	24.02	16.27	68	1	40	40-160
Total Xylenes	72.07	50.40	70	1	40	40-160

* Indicates values outside of acceptability limits.
a Acceptability limits as per laboratory practice.
NA Not Applicable. % Recovery is not calculated when sample results exceed five times the spike concentration.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

METHOD BLANK RESULTS

Aromatic Volatile Organics in Soil - Low Level
Modified EPA Method 8020[a]

GTEL Sample Number		BS12019214B	--	--	--
Client Identification		METHOD BLANK	--	--	--
Date Analyzed		12/01/92	--	--	--
Analyte	Detection Limit, ug/kg	Concentration, ug/kg (dry)			
Benzene	1.0	< 1.0	--	--	--
Toluene	1.7	< 1.7	--	--	--
Ethylbenzene	1.0	< 1.0	--	--	--
Xylenes (total)	2.0	< 2.0	--	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	1.0	< 1.0	--	--	--
1,2-Dichlorobenzene	1.7	< 1.7	--	--	--
1,3-Dichlorobenzene	1.7	< 1.7	--	--	--
1,4-Dichlorobenzene	1.7	< 1.7	--	--	--
Detection Limit Multiplier[b]		1	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample prepared by EPA Method 5030. Method modified to include additional compounds. Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil
Modified EPA Method 8020[a]

GTEL Sample Number		110552-01	110552-02	110552-03	--
Client Identification		IP-1	MW-19 2-4'	MW-19 54-55'	--
Date Sampled		11/19/92	11/19/92	11/19/92	--
Date Analyzed		11/30/92	11/30/92	11/30/92	--
Analyte	Reporting Limit, mg/kg	Concentration, mg/kg (dry)			
Benzene	0.05	< 0.15	< 0.14	< 0.13	--
Toluene	0.05	< 0.38	< 0.37	< 0.33	--
Ethylbenzene	0.10	< 0.60	< 0.59	< 0.54	--
Xylenes (total)	0.20	< 1.3	< 1.3	< 1.2	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.12	< 0.15	< 0.14	< 0.13	--
1,2-Dichlorobenzene	0.25	< 0.30	< 0.30	< 0.27	--
1,3-Dichlorobenzene	0.25	< 0.30	< 0.30	< 0.27	--
1,4-Dichlorobenzene	0.25	< 0.30	< 0.30	< 0.27	--
Sample Dilution Factor[b]		1.21[c]	1.18[c]	1.08[c]	--
Percent Solids		82.2	84.6	93.0	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Methanolic extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The sample dilution factor indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

c Sample was not analyzed low level due to the interference of non-target compounds.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

SURROGATE RECOVERY RESULTS

Volatile Organics in Soil
(Trifluorotoluene)
EPA Method 8020

Sample	Amount Added, ug/L	Surrogate Recovery, %
BW11309220B	95.2	90.1
BS11309220A	95.2	88.6
110552-04 MS	95.2	86.4
110552-04 MSD	95.2	85.5
110552-01	95.2	85.2
110552-02	95.2	82.4
110552-03	95.2	82.6
BS11309220C	95.2	73.8

Acceptability Limits[a] 26-125%

a Laboratory generated acceptability limits updated 05/28/92.
MS Matrix Spike.
MSD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) SUMMARY
PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)

Volatile Organics in Soil
EPA Method 8020

Sample Spiked: 110552-04 Client ID: BATCH QC

Date(s) of Analysis: 11/30/92 Standard ID: BX92QC0289

Analyte	Spike Added, mg/kg	Sample Concentration, mg/kg	MS Concentration, mg/kg	MS Percent Recovery	Acceptability Limits, % Rec.[a]
Benzene	57.73	< 0.14	53.09	92	40-160
Toluene	61.95	< 0.37	54.27	88	40-160
Ethylbenzene	62.06	< 0.59	59.40	96	40-160
Total Xylenes	187.02	< 1.31	179.76	96	40-160

Analyte	Spike Added, mg/kg	MSD Concentration, mg/kg	MSD Percent Recovery	RPD, %	Acceptability Limits[a]	
					RPD	% Recovery
Benzene	57.38	54.08	94	2	40	40-160
Toluene	61.58	55.47	90	2	40	40-160
Ethylbenzene	61.69	60.85	98	2	40	40-160
Total Xylenes	185.90	183.96	98	2	40	40-160

* Indicates values outside of acceptability limits.
a Acceptability limits as per laboratory practice.
NA Not Applicable. % Recovery is not calculated when sample results exceed five times the spike concentration.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

METHOD BLANK RESULTS

Aromatic Volatile Organics in Soil
Modified EPA Method 8020[a]

GTEL Sample Number		BS11309220A	BW11309220B	BS11309220C	--
Client Identification		METHOD BLANK	METHOD BLANK	METHOD BLANK	--
Date Analyzed		11/30/92	11/30/92	11/30/92	--
Analyte	Reporting Limit, mg/kg	Concentration, mg/kg (dry)			
Benzene	0.05	**88***	< 0.05	< 0.05	--
Toluene	0.05	**89***	< 0.05	< 0.05	--
Ethylbenzene	0.10	**98***	< 0.10	< 0.10	--
Xylenes (total)	0.20	**300***	< 0.20	< 0.20	--
BTEX (total)	--	**580***	--	--	--
Chlorobenzene	0.12	< 0.12	< 0.12	< 0.12	--
1,2-Dichlorobenzene	0.25	< 0.25	< 0.25	< 0.25	---
1,3-Dichlorobenzene	0.25	< 0.25	< 0.25	< 0.25	--
1,4-Dichlorobenzene	0.25	< 0.25	< 0.25	< 0.25	--
Methyl tert-Butyl Ether	1.0	< 1.0	< 1.0	< 1.0	--
Sample Dilution Factor[b]		1	1	1	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Methanolic extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The sample dilution factor indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

* See Nonconformance Summary.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

ANALYTICAL RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		110552-05	110552-06	110552-07	--
Client Identification		FIELD BLANK	EQUIP BLANK	TRIP BLANK	--
Date Sampled		11/20/92	11/20/92	11/20/92	--
Date Analyzed		11/25/92	11/25/92	11/25/92	--
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.2	< 0.2	< 0.2	< 0.2	--
Toluene	0.5	< 0.5	< 0.5	< 0.5	--
Ethyl Benzene	0.8	< 0.8	< 0.8	< 0.8	--
Xylenes (total)	1.7	< 1.7	< 1.7	< 1.7	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.2	< 0.2	< 0.2	< 0.2	--
1,2-Dichlorobenzene	0.4	< 0.4	< 0.4	< 0.4	--
1,3-Dichlorobenzene	0.4	< 0.4	< 0.4	< 0.4	--
1,4-Dichlorobenzene	0.3	< 0.3	< 0.3	< 0.3	--
Detection Limit Multiplier[b]		1	1	1	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

SURROGATE RECOVERY RESULTS

Aromatic Volatile Organics in Water
(Trifluorotoluene)
Modified EPA Method 8020

Sample	Amount Added, ug/L	Surrogate Recovery, %
BW11259219C	95.2	73.7
110552-05	95.2	64.3
110552-06	95.2	61.8
110552-07	95.2	60.5

Acceptability Limits[a] 45-125%

a Laboratory generated acceptability limits updated 07/11/91.
MS Matrix Spike.
DUP Sample Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

METHOD BLANK RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		BW11259219C	--	--	--
Client Identification		METHOD BLANK	--	--	--
Date Analyzed		11-25-92	--	--	--
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.2	< 0.2	--	--	--
Toluene	0.5	< 0.5	--	--	--
Ethyl Benzene	0.8	< 0.8	--	--	--
Xylenes (total)	1.7	< 1.7	--	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.2	< 0.2	--	--	--
1,2-Dichlorobenzene	0.4	< 0.4	--	--	--
1,3-Dichlorobenzene	0.4	< 0.4	--	--	--
1,4-Dichlorobenzene	0.3	< 0.3	--	--	--
Detection Limit Multiplier[b]		1	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		110512-01	110512-02	110512-03	110512-04
Client Identification		MP-4	MP-3	MP-2	MP-1
Date Sampled		11/16/92	11/18/92	11/18/92	11/18/92
Date Extracted		11/30/92	11/30/92	11/30/92	11/30/92
Date Analyzed		12/03/92	12/03/92	12/03/92	12/03/92
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	**140**	< 1400	< 1500	< 1400
Acenaphthylene	77	< 96	< 1800	< 2000	< 1800
1-Methylnaphthalene	60	< 75	< 1400	< 1500	**2000**
2-Methylnaphthalene	60	< 75	< 1400	< 1500	**3400**
Acenaphthene	60	< 75	< 1400	< 1500	< 1400
Fluorene	7.0	**87**	< 170	**180**	**260**
Phenanthrene	21	**230**[c]	< 500	**1100**	**2700**
Anthracene	22	**910**[c]	< 520	< 560	**720**
Fluoranthene	7.0	**1100**[c]	**290**	**1600**	**400**
Pyrene	9.0	**450**[c]	< 210	**770**	< 220
Benzo[*a*]anthracene	0.43	**430**[c]	**130**	**610**	**120**
Chrysene	5.0	**620**[c]	**160**	**580**	**140**
Benzo[*b*]fluoranthene	0.60	**610**[c]	**150**	**550**	**150**
Benzo[*k*]fluoranthene	0.57	**280**[c]	**69**	**230**	**53**
Benzo[*a*]pyrene	0.77	**590**[c]	**160**	**530**	**130**
Dibenzo[*a,h*]anthracene	1.0	**56**	< 24	**54**	< 24
Benzo[*g,h,i*]perylene	2.5	**530**	< 60	**290**	**170**
Indeno[1,2,3-*cd*]pyrene	1.4	**620**[c]	**190**	**480**	**74**
Detection Limit Multiplier[b]		1.25[c]	23.8	25.6	24.0
Percent Solids, %		78.7	82.6	77.4	81.4

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.
b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.
c Detection Limit Multiplier for analyte noted = 25.0; Date Analyzed = 12/05/92.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		110513-01	110513-02	110513-03	--
Client Identification		MW-18 2-4'	MW-18 39-41'	MW-18 57-58'	--
Date Sampled		11/17/92	11/17/92	11/17/92	--
Date Extracted		11/30/92	11/30/92	11/30/92	--
Date Analyzed		12/03/92	12/03/92	12/03/92	--
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	< 1400	< 64	< 64	--
Acenaphthylene	77	< 1800	< 82	< 82	--
1-Methylnaphthalene	60	< 1400	< 64	< 64	--
2-Methylnaphthalene	60	< 1400	< 64	< 64	--
Acenaphthene	60	< 1400	< 64	< 64	--
Fluorene	7.0	< 160	< 7.4	< 7.5	--
Phenanthrene	21	**800**	< 22	**32**	--
Anthracene	22	**1100**	< 23	**40**	--
Fluoranthene	7.0	**1000**	< 7.4	**31**	--
Pyrene	9.0	**800**	< 9.5	**10**	--
Benzo[a]anthracene	0.43	**400**	**1.3**	**9.9**	--
Chrysene	5.0	**380**	< 5.3	**16**	--
Benzo[*b*]fluoranthene	0.60	**370**	**1.8**	**11**	--
Benzo[*k*]fluoranthene	0.57	**180**	**1.0**	**6.3**	--
Benzo[a]pyrene	0.77	**400**	**1.7**	**11**	--
Dibenzo[*a,h*]anthracene	1.0	**65**	< 1.1	**2.4**	--
Benzo[*g,h,i*]perylene	2.5	**210**	< 2.7	**6.9**	--
Indeno[1,2,3-*cd*]pyrene	1.4	**360**	< 1.5	**7.7**	--
Detection Limit Multiplier[b]		23.0	1.06	1.07	--
Percent Solids, %		85.1	92.6	92.3	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		110552-01	110552-02	110552-03	110552-04
Client Identification		IP-1	MW-19 2-4'	MW-19 54-55'	DUP-2
Date Sampled		11/19/92	11/19/92	11/19/92	11/21/92
Date Extracted		11/30/92	11/30/92	11/30/92	11/30/92
Date Analyzed		12/05/92[c]	12/05/92	12/05/92	12/05/92
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	< 1500	< 7000	< 63	< 1400
Acenaphthylene	77	< 1900	< 8900	< 81	< 1800
1-Methylnaphthalene	60	**16000**	< 7000	< 63	< 1400
2-Methylnaphthalene	60	**28000**	< 7000	< 63	< 1400
Acenaphthene	60	< 1500	< 7000	< 63	< 1400
Fluorene	7.0	**1700**	**3100**	< 7.4	< 160
Phenanthrene	21	**12000**[c]	**14000**	< 22	< 490
Anthracene	22	**3300**	**19000**	< 23	< 510
Fluoranthene	7.0	**600**	**19000**	< 7.4	**490**
Pyrene	9.0	< 220	**8800**	< 9.5	< 210
Benzo[*a*]anthracene	0.43	**160**	**7000**	< 0.45	**230**
Chrysene	5.0	< 120	**7000**	< 5.2	< 120
Benzo[*b*]fluoranthene	0.60	**140**	**6100**	< 0.63	**220**
Benzo[*k*]fluoranthene	0.57	**48**	**2900**	< 0.60	**93**
Benzo[*a*]pyrene	0.77	**120**	**6400**	< 0.81	**220**
Dibenzo[*a,h*]anthracene	1.0	< 24	**700**	< 1.0	< 23
Benzo[*g,h,i*]perylene	2.5	**240**	**3600**	< 2.6	**140**
Indeno[1,2,3-*cd*]pyrene	1.4	**97**	< 160	< 1.5	**180**
Detection Limit Multiplier[b]		24.0[c]	116	1.05	23.2
Percent Solids, %		82.2	84.6	93.0	84.1

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.
b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.
c Detection Limit Multiplier for analyte noted = 242; Date Analyzed = 12/08/92.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

GTEL Sample Number		110552-05	110552-06	--	--
Client Identification		FIELD BLANK	EQUIP BLANK	--	--
Date Sampled		11/20/92	11/20/92	--	--
Date Extracted		11/24/92	11/24/92	--	--
Date Analyzed		12/05/92	12/05/92	--	--
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Naphthalene	1.8	< 1.8	< 1.8	--	--
Acenaphthylene	2.3	< 2.3	< 2.3	--	--
1-Methylnaphthalene	1.8	< 1.8	< 1.8	--	--
2-Methylnaphthalene	1.8	< 1.8	< 1.8	--	--
Acenaphthene	1.8	< 1.8	< 1.8	--	--
Fluorene	0.21	< 0.21	< 0.21	--	--
Phenanthrene	0.64	< 0.64	< 0.64	--	--
Anthracene	0.66	< 0.66	< 0.66	--	--
Fluoranthene	0.21	< 0.21	< 0.21	--	--
Pyrene	0.27	< 0.27	< 0.27	--	--
Benzo[*a*]anthracene	0.013	< 0.013	< 0.013	--	--
Chrysene	0.15	< 0.15	< 0.15	--	--
Benzo[*b*]fluoranthene	0.018	< 0.018	< 0.018	--	--
Benzo[*k*]fluoranthene	0.017	< 0.017	< 0.017	--	--
Benzo[*a*]pyrene	0.023	< 0.023	< 0.023	--	--
Dibenzo[*a,h*]anthracene	0.030	< 0.030	< 0.030	--	--
Benzo[*g,h,i*]perylene	0.076	< 0.076	< 0.076	--	--
Indeno[1,2,3-*cd*]pyrene	0.043	< 0.043	< 0.043	--	--
Detection Limit Multiplier[b]		1.00	1.00	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3510 (liquid-liquid).

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

SURROGATE RECOVERY SUMMARY

Polynuclear Aromatic Hydrocarbons in Water/Soil
EPA Method 8310

GTEL Sample ID	Percent Recovery, %	
	S1 (NBZ)	S2 (TPH)
BS1130-1	80	95
110512-01 MS	83	137
110512-01 MSD	87	135
110513-01	71	115
110513-02	71	83
110513-03	76	93
110512-01 MS	76	126
110512-01 MSD	81	126
110552-01 (12/05/92)	92	190*
110552-02	D	D
110552-03	88	99
110552-04	77	119
110552-05	94	90
110552-06	87	60
110552-01 (12/08/92)	D	D
BW1124-1	93.9	93.7
110512-01	76	137
110512-02	73	102
110512-03	75	177*
110512-04	77	121
LS1130-1	84	97

Surrogates

			Recovery Limits[a]
S1	NBZ	Nitrobenzene-d5	33-141%
S2	TPH	Terphenyl-d14	33-141%

D Surrogate diluted out. % Recovery not calculated when surrogate diluted out.
* Indicates values outside of acceptability limits. See Nonconformance Summary,
a Recovery limits as per laboratory practice.
MS Matrix Spike.
MSD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

MATRIX SPIKE/DUPLICATE RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: 110512-01 Client ID: BATCH QC

Standard ID: 12/03/92 and 12/05/92

Compound	Spike Added, ug/kg	Sample Concentration, ug/kg	MS Concentration, ug/kg	MS Percent Recovery, %	Acceptability Limits, %
Naphthalene	417	135	473	81	Det-122
Acenaphthylene	417	< 80.9	377	90	Det-139
Fluorene	83.5	86.5	138	62	Det-142
Phenanthrene	41.7	229	189	NA	Det-155
Anthracene	41.7	913	641	NA	Det-126
Benzo[*k*]fluoranthene	41.7	277	192	NA	Det-159
Indeno[1,2,3-*cd*]pyrene	41.7	621	387	NA	Det-116

Compound	Spike Added, ug/kg	MSD Concentration, ug/kg	MSD Percent Recovery, %	RPD, %	Acceptability Limits: RPD, %
Naphthalene	413	452	77	5	60
Acenaphthylene	413	399	97	7	60
Fluorene	82.7	129	51	18	60
Phenanthrene	41.3	257	NA	30	60
Anthracene	41.3	543	NA	17	60
Benzo[*k*]fluoranthene	41.3	178	NA	8	60
Indeno[1,2,3-*cd*]pyrene	41.3	342	NA	12	60

* Values outside of QC limits.
Det Detection Limit
NA Not Applicable. Percent Recovery is not calculated when concentration of sample is more than four times that of spike.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

LABORATORY CONTROL SAMPLE (LCS) RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: LS1130-1

Date Analyzed: 12/03/92 Standard ID: H92MS0050

Compound	Spike Added, ug/kg	LCS Concentration, ug/kg	LCS Percent Recovery, %
Naphthalene	328	322	98
Acenaphthylene	328	316	96
Fluorene	65.6	63.0	96
Phenanthrene	32.8	33.6	102
Anthracene	32.8	36.4	111
Benzo[*k*]fluoranthene	32.8	33.2	101
Indeno[1,2,3-*cd*]pyrene	32.8	27.8	85

* Values outside of QC limits.
D Diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration of sample is more than four times that of spike.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M2-11-0512
M2-11-0513
M2-11-0552

METHOD BLANK RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

	GTEL Blank ID	BS1130-1
	GTEL File ID	BS11301
	Date Extracted	11/30/92
	Date Analyzed	12/01/92
Analyte	Detection Limit, ug/kg	Concentration, ug/kg
Naphthalene	60	< 59
Acenaphthylene	77	< 76
1-Methylnaphthalene	60	< 59
2-Methylnaphthalene	60	< 59
Acenaphthene	60	< 59
Fluorene	7.0	< 6.9
Phenanthrene	21	< 21
Anthracene	22	< 22
Fluoranthene	7.0	< 6.9
Pyrene	9.0	< 8.9
Benzo[*a*]anthracene	0.43	< 0.42
Chrysene	5.0	< 4.9
Benzo[*b*]fluoranthene	0.60	< 0.59
Benzo[*k*]fluoranthene	0.57	< 0.56
Benzo[*a*]pyrene	0.77	< 0.76
Dibenzo[*a,h*]anthracene	1.0	< 0.99
Benzo[*g,h,i*]perylene	2.5	< 2.5
Indeno[1,2,3-*cd*]pyrene	1.4	< 1.4
Detection Limit Multiplier		0.988

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.
b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

METHOD BLANK RESULTS

Polynuclear Aromatic Hydrocarbons in [illegible]
EPA Method 610[a]

	GTEL Blank I:	[illegible]
	GTEL File I:	[illegible]
	Date Extracte:	[illegible]
	Date Analyze:	[illegible]
Analyte	Detection Limit, ug/L	[illegible]
Naphthalene	1.8	[illegible]
Acenaphthylene	2.3	[illegible]
1-Methylnaphthalene	1.8	[illegible]
2-Methylnaphthalene	1.8	[illegible]
Acenaphthene	1.8	[illegible]
Fluorene	0.21	[illegible]
Phenanthrene	0.64	[illegible]
Anthracene	0.66	[illegible]
Fluoranthene	0.21	[illegible]
Pyrene	0.27	[illegible]
Benzo[*a*]anthracene	0.013	[illegible]
Chrysene	0.15	[illegible]
Benzo[*b*]fluoranthene	0.018	[illegible]
Benzo[*k*]fluoranthene	0.017	[illegible]
Benzo[*a*]pyrene	0.023	[illegible]
Dibenzo[*a,h*]anthracene	0.030	[illegible]
Benzo[*g,h,i*]perylene	0.076	[illegible]
Indeno[1,2,3-*cd*]pyrene	0.043	[illegible]
Detection Limit Multiplier		[illegible]

a Federal Register, Vol. 49, October 26, 1984. Sample preparation [illegible]
b The detection limit multiplier indicates the adjustments made to th[illegible] dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

51627

Company Name: GTI Albany
Phone #:
FAX #:
Company Address:
Site location: Buffalo

Project Manager: Bruce Ahrens
Client Project ID: (#) 011105306 650339
(NAME) Osmose Ogden

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MP-4	1	1		X											11/16	2:30
MP-3	2	2		X											11/18	1:30
MP-2	3	2		X											11/18	2:30
MP-1	4	2		X											11/18	3:15
MP-3	5	3		X											11/18	1:30

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
									X					X						

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ☐
Business Days ☐

Special Handling
GTEL Contact
Quote/Contract # QM920306
Confirmation #
PO #

SPECIAL DETECTION LIMITS

REMARKS

SPECIAL REPORTING REQUIREMENTS

Lab Use Only Lot #

Storage Location: WRE

Project-Specific
BLUE ☒ CLP ☐
QA / QC LEVEL
OTHER
FAX ☐
Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	11/19/92	6:00	Received by:
Relinquished by:			Received by:
Relinquished by:	11/20/92	12:20	Received by Laboratory: Grace A. Ford

Waybill # 478 1281 7 840

Rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST 47174

Company Name: GTI: Albany
Phone #:
FAX #:
Company Address:
Site location: Buffalo, NY
Project Manager: Bruce Ahrens
Client Project ID: (#) 011105307 6309
(NAME) Osmose Phase II
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-18 2-4'	1	3		X											11/17	12:00
"		2		X												12:00
MW-18 39-41'	2	#1		X												3:00
"		1		X												3:00
MW-18 57-58'	3	3		X												4:45
"		2		X												4:45

ANALYSIS REQUEST — OTHER

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
									X										
													X						
									X										
													X						
									X										
													X						

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ☐
Business Days

Special Handling
GTEL Contact
Quote/Contract # QM920306
Confirmation #
PO #

SPECIAL DETECTION LIMITS

REMARKS

SPECIAL REPORTING REQUIREMENTS

Lab Use Only Lot # Storage Location: WRE

Project-Specific
BLUE ☒ CLP ☐
QA / QC LEVEL
OTHER
FAX ☐
Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	11/19/92	6:00	Received by:
Relinquished by	Date	Time	Received by:
Relinquished by:	11/20/92	13:00	Received by Laboratory: Diane A. Ward 478 16×17 840

Waybill # 537 [illegible] 701 | 11/20/92

Rev. 7/92

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

MOBIL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

05182

Company Name: GTI Albany
Phone #:
FAX #:
Company Address:
Site location: (City, State) Buffalo, NY

Project Manager: Bruce Ahrens
Client Project ID: (#) 01110 5307
(NAME) Osmose Phase II

I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
IP-1		1		X								X			11/19	9:00
IP-1		3		X								X				9:00
MW-19 2-4'		3		X								X				11:00
"		2		X								X				11:00
MW-19 54-55'		3		X								X				4:00
"		2		X								X				4:00
DUP-2		1		X								X			11/20	12:30
DUP-2		2		X								X				12:30

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐			
									X									X						
									X															
									X															
																		X						
									X															
																		X						
									X															
																		X						

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ☐
Business Days ☐

Special Handling
QM920306
GTEL Contact
Confirmation #
THIS DOCUMENT SERVES AS AN AUTHORIZATION TO CONDUCT THE ABOVE OUTLINED TESTS IN ACCORDANCE WITH MOBIL CONTRACT # UC90-0619 DATED APRIL 15, 1990.

SPECIAL DETECTION LIMITS

REMARKS
MOBIL ENV. ENG.:
MOBIL SSN:

SPECIAL REPORTING REQUIREMENTS

Lab Use Only Lot #
Storage Location: 9 WC

QA / QC LEVEL
project specific
BLUE ☒ CLP ☐
OTHER
FAX ☐
Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	11/20/92	4:00	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	11/21/92	16:00	Received by Laboratory:

Waybill # 477868127851

Rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.
MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

MOBIL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST 05182

Company Name: GTI Albany
Phone #:
FAX #:
Company Address:
Site location: (City, State) Buffalo, NY
Project Manager: Bruce Ahrens
Client Project ID: (#) 01105307
(NAME) Osmose Phase II
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME	BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER
IP-1		1		X								X			11/19	9:00													X							
IP-1		3		X								X				9:00										X									
MW-19 2-4'		3		X								X				11:00										X									
"		2		X								X				11:00													X							
MW-19 54-55'		3		X								X				4:00										X									
"		2		X								X			↓	4:00													X							
DUP-2		1		X								X			11/20	12:30										X									
DUP-2		2		X								X			↓	12:30													X							

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐

Special Handling
QM920306
GTEL Contact ____
Confirmation # ____
THIS DOCUMENT SERVES AS AN AUTHORIZATION TO CONDUCT THE ABOVE OUTLINED TESTS IN ACCORDANCE WITH MOBIL CONTRACT # UC90-0619 DATED APRIL 15, 1990.

SPECIAL DETECTION LIMITS

REMARKS
MOBIL ENV. ENG.:
MOBIL SSN:

project specific
QA / QC LEVEL
BLUE ☒ CLP ☐
OTHER ____

SPECIAL REPORTING REQUIREMENTS
FAX ☐

Lab Use Only Lot #
Storage Location: 4WC
Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	11/20/92	4:00	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	11/21/92	16:00	Received by Laboratory: Mark Blin

Waybill # 478681785 1

Rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.
MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

MOBIL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

05181

Company Name: GTI Albany
Phone #:
FAX #:
Company Address:
Site location: (City, State) Buffalo, NY
Project Manager: Bruce Ahrens
Client Project ID: (#) 01110530 7 6309
(NAME) Osmose
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
Field Blank		2	X									X			11/20	11:00
Field Blank		3	X						X			X				11:00
Equip Blank		2	X									X				11:15
Equip Blank		3	X						X			X				11:15
Trip Blank		2	X													

BTEX/602 ☐ 8020 ☐ with MTBE ☐
BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐
Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐
Hydrocarbon Profile (SIMDIS) ☐
Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐
TPH/IR 418.1 ☐ SM 503 ☐
EDB by 504 ☐ DBCP by 504 ☐
EPA 503.1 ☐ EPA 502.2 ☐
EPA 601 ☐ EPA 8010 ☐
EPA 602 ☐ EPA 8020 ☒ — X
EPA 608 ☐ 8080 ☐ PCB only ☐
EPA 624/PPL ☐ 8240/TAL ☒ NBS (+15) ☐
EPA 625/PPL ☐ 8270/TAL ☒ NBS (+25) ☐
EPA 610 ☐ 8310 ☒ — X
EP TOX Metals ☒ Pesticides ☐ Herbicides ☐
TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐
EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐
CAM Metals TTLC ☐ STLC ☐
Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐
Organic Lead ☐
Corrosivity ☐ Flash Point ☐ Reactivity ☐

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐

Special Handling: QM 920306
GTEL Contact ____
Confirmation # ____
THIS DOCUMENT SERVES AS AN AUTHORIZATION TO CONDUCT THE ABOVE OUTLINED TESTS IN ACCORDANCE WITH MOBIL CONTRACT # UC90-0619 DATED APRIL 15, 1990.

SPECIAL DETECTION LIMITS

REMARKS
MOBIL ENV. ENG.:
MOBIL SSN:

SPECIAL REPORTING REQUIREMENTS

Lab Use Only Lot # Storage Location: 21-4D 4WC

QA / QC LEVEL: project specific
BLUE ☒ CLP ☐
OTHER ____
FAX ☐

Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	11/20/92	4:00	Received by:
Relinquished by:			Received by:
Relinquished by:	11/21/92	16:00	Received by Laboratory: Mam Blm

Waybill # 472681?851

Rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) 441-4835

~~MOBIL~~

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

05181

Company Name: GTI Albany

Phone #:

FAX #:

Company Address:

Site location: (City, State) Buffalo, NY

Project Manager: Brian Ahrens

Client Project ID: (#) C1110530 7 6309

(NAME) Cornise

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
Field Blank		2	X									X			11/20	11:00
Field Blank		3	X						X			X				11:00
Equip Blank		2	X									X				11:15
Equip Blank		3	X						X			X				11:15
Trip Blank		2	X													

ANALYSIS REQUEST / OTHER

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☒ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☒ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER
													X								
									X												
													X								
									X												
									X												

TAT

Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐

Special Handling: ON 920306

GTEL Contact ____

Confirmation # ____

THIS DOCUMENT SERVES AS AN AUTHORIZATION TO CONDUCT THE ABOVE OUTLINED TESTS IN ACCORDANCE WITH MOBIL CONTRACT # UC90-0619 DATED APRIL 15, 1990.

SPECIAL DETECTION LIMITS

REMARKS
MOBIL ENV. ENG.:
MOBIL SSN:

SPECIAL REPORTING REQUIREMENTS

Project Specific

QA / QC LEVEL

BLUE ☒ CLP ☐

OTHER ____

FAX ☐

Lab Use Only Lot #

Storage Location: 21-4D 9WC

Work Order #

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J. Olaf Gustafson	11/20/92	4:00	Received by:
Relinquished by:			Received by:
Relinquished by:	11/21/92	16:00	Received by Laboratory: Mam Bln

Waybill # 478678117851

Rev 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

51833

Company Name: G.T.I

Phone #: 518-370-5831

FAX #:

Company Address: 1245 KINGS ROAD SCHENECTADY, NY

Site location: Buffalo, NY

Project Manager: Bruce Ahrens

Client Project ID: (#)

(NAME) OSMOSE Wood Preserving

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): J Vautour

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
Trip Blank		2	X												11/2/92	13:00
Field Blank		5/4	X													

ANALYSIS REQUEST

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☐	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER
											X					
											X				X	PAH by 8270

TAT

- Priority (24 hr) ☐
- Expedited (48 hr) ☐
- 7 Business Days ☐
- Other _____
- Business Days ☐

Special Handling

GTEL Contact: D. WAGNER

Quote/Contract #: QM920306

Confirmation #: _____

PO #: _____

SPECIAL DETECTION LIMITS

REMARKS

SPECIAL REPORTING REQUIREMENTS

FAX ☐

Lab Use Only Lot #

Storage Location:

Work Order #

QA / QC LEVEL

BLUE ☒ CLP ☐ OTHER _____

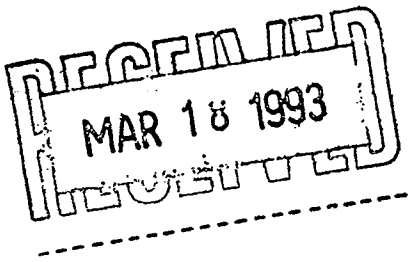
CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: J Vautour	11/2/92	13:10	Received by:
Relinquished by:			Received by:
Relinquished by:			Received by Laboratory:
	11/2/92	16:00	Waybill #

Rev. 7/91

GTEL
ENVIRONMENTAL
LABORATORIES, INC.
Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523



March 17, 1993

Bruce Ahrens
Groundwater Technology, Inc.
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 02/20/93 under chain-of-custody records 54146, 54147, 54148 and 53226.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Susan C. Uhler
Laboratory Director

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

CONFORMANCE/NONCONFORMANCE SUMMARY

(X = Requirements Met * = See Comments NA = Not Applicable)

#	Conformance Item	VOA GC	VOA GC/MS	SV GC	SV GC/MS	Metals	Wet Chem
1	GC/MS Tune	NA	--	NA	--	NA	NA
2	Initial Calibration	X	--	X	--	--	--
3	Continuing Calibration	X	--	X	--	--	--
4	Surrogate Recovery	X	--	X	--	NA	NA
5	Holding Time	X	--	X	--	--	--
6	Method Accuracy	X	--	*	--	--	--
7	Method Precision	X	--	*	--	--	--

8 Blank Contamination - List/ND (None Detected)/*(See Comments)

VOA:	ND
SV:	ND
Metals:	--
Wet Chem:	--

9 Comments:

Method 8310:
The recovery limits were exceeded in the Batch Matrix Spike (MS) for Naphthalene and Fluorene due to sample specific matrix effect. The flagged values should be considered maximum concentrations present in the sample. The Laboratory Control Sample (LS0225-1) has been provided to support method accuracy.

The maximum relative percent difference (RPD) was exceeded for Fluoranthene in the sample duplicate due to demonstrated sample heterogeneity. The flagged value should be considered an estimated concentration present in the sample.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil - Low Level
Modified EPA Method 8020[a]

GTEL Sample Number		020523-03	020523-04	020523-05	020523-06
Client Identification		MW-24 18-20'	MW-23 6-8'	MW-23 16-18'	MW-23 18-20'
Date Sampled		02/16/93	02/17/93	02/17/93	02/17/93
Date Analyzed		02/25/93	02/25/93	02/25/93	02/25/93
Analyte	Detection Limit, ug/kg	Concentration, ug/kg (dry)			
Benzene	1.0	< 1.2	< 2.6	< 2.4	< 2.3
Toluene	1.7	< 2.1	< 4.3	< 4.2	< 3.9
Ethylbenzene	1.0	< 1.2	< 2.6	< 2.4	< 2.3
Xylenes (total)	2.0	< 2.5	< 5.1	< 4.9	< 4.6
BTEX (total)	--	--	--	--	--
Chlorobenzene	1.0	< 1.2	< 2.6	< 2.4	< 2.3
1,2-Dichlorobenzene	1.7	< 2.1	< 4.3	< 4.2	< 3.9
1,3-Dichlorobenzene	1.7	< 2.1	< 4.3	< 4.2	< 3.9
1,4-Dichlorobenzene	1.7	< 2.1	< 4.3	< 4.2	< 3.9
Detection Limit Multiplier[b]		1.23	2.55	2.45	2.31
Percent Solids		82.4	77.9	83.6	81.6

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample prepared by EPA Method 5030. Method modified to include additional compounds. Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil - Low Level
Modified EPA Method 8020[a]

GTEL Sample Number		020523-08	020523-09	020523-10	020523-11
Client Identification		MW-26 10-12'	MW-26 18-20'	MW-22 4-6'	MW-22 10-12'
Date Sampled		02/17/93	02/17/93	02/18/93	02/18/93
Date Analyzed		02/25/93	02/25/93	02/25/93	02/25/93
Analyte	Detection Limit, ug/kg	Concentration, ug/kg (dry)			
Benzene	1.0	< 2.4	< 2.6	< 2.4	< 2.2
Toluene	1.7	< 4.1	< 4.4	< 4.0	< 3.7
Ethylbenzene	1.0	< 2.4	< 2.6	< 2.4	< 2.2
Xylenes (total)	2.0	< 4.8	< 5.2	< 4.7	< 4.3
BTEX (total)	--	--	--	--	--
Chlorobenzene	1.0	< 2.4	< 2.6	< 2.4	< 2.2
1,2-Dichlorobenzene	1.7	< 4.1	< 4.4	< 4.0	< 3.7
1,3-Dichlorobenzene	1.7	< 4.1	< 4.4	< 4.0	< 3.7
1,4-Dichlorobenzene	1.7	< 4.1	< 4.4	< 4.0	< 3.7
Detection Limit Multiplier[b]		2.39	2.59	2.36	2.16
Percent Solids		86.9	80.5	81.0	87.8

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample prepared by EPA Method 5030. Method modified to include additional compounds. Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil - Low Level
Modified EPA Method 8020[a]

GTEL Sample Number		020523-12	020523-13	--	--
Client Identification		MW-22 23-25'	MW-27 7-9'	--	--
Date Sampled		02/18/93	02/19/93	--	--
Date Analyzed		02/25/93	02/25/93	--	--
Analyte	Detection Limit, ug/kg	Concentration, ug/kg (dry)			
Benzene	1.0	< 2.2	< 2.4	--	--
Toluene	1.7	< 3.7	< 4.1	--	--
Ethylbenzene	1.0	< 2.2	< 2.4	--	--
Xylenes (total)	2.0	< 4.4	< 4.8	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	1.0	< 2.2	< 2.4	--	--
1,2-Dichlorobenzene	1.7	< 3.7	< 4.1	--	--
1,3-Dichlorobenzene	1.7	< 3.7	< 4.1	--	--
1,4-Dichlorobenzene	1.7	< 3.7	< 4.1	--	--
Detection Limit Multiplier[b]		2.20	2.39	--	--
Percent Solids		88.3	87.3	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample prepared by EPA Method 5030. Method modified to include additional compounds. Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

SURROGATE RECOVERY RESULTS

Volatile Organics in Soil - Low Level
(Trifluorotoluene)
EPA Method 8020

Sample	Amount Added, ug/L	Surrogate Recovery, %
BL02259314C	95.2	94.4
020523-11	95.2	86.3
020523-10	95.2	80.3
020523-12	95.2	96.4
020523-13	95.2	69.6
020523-04	95.2	53.6
020523-05	95.2	97.0
020523-06	95.2	91.2
020523-08	95.2	97.4
020523-09	95.2	79.7
020523-03	95.2	91.5
MS020523-11	95.2	101.6
MD020523-11	95.2	80.0

Acceptability Limits[a] 26-125%

a Laboratory generated acceptability limits updated 05/28/92.
MS Matrix Spike.
MD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) SUMMARY
PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)

Volatile Organics in Soil
EPA Method 8020

Sample Spiked:	020523-11	Client ID:	BATCH QC
Date of Analysis:	02/26/93	Standard ID:	BX92QC0442

Analyte	Spike Added, ug/kg	Sample Concentration, ug/kg	MS Concentration, ug/kg	MS Percent Recovery	Acceptability Limits, % Rec.[a]
Benzene	44.17	< 2.16	42.70	97	40-160
Toluene	44.17	< 3.67	43.98	100	40-160
Ethylbenzene	44.17	< 2.16	45.40	103	40-160
Total Xylenes	132.51	< 4.32	135.18	102	40-160

Analyte	Spike Added, ug/kg	MSD Concentration, ug/kg	MSD Percent Recovery	RPD, %	Acceptability Limits[a]	
					RPD	% Recovery
Benzene	43.33	41.45	96	1	40	40-160
Toluene	43.33	41.02	95	5	40	40-160
Ethylbenzene	43.33	40.71	94	9	40	40-160
Total Xylenes	129.99	123.15	95	7	40	40-160

* Indicates values outside of acceptability limits.
a Acceptability limits as per laboratory practice.
NA Not Applicable. % Recovery is not calculated when sample results exceed five times the spike concentration.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

METHOD BLANK RESULTS

Aromatic Volatile Organics in Soil - Low Level
Modified EPA Method 8020[a]

GTEL Sample Number		BL02259314C	--	--	-
Client Identification		METHOD BLANK	--	--	--
Date Analyzed		02/25/93	--	--	--
Analyte	Detection Limit, ug/kg	Concentration, ug/kg (dry)			
Benzene	1.0	< 1.0	--	--	--
Toluene	1.7	< 1.7	--	--	--
Ethylbenzene	1.0	< 1.0	--	--	--
Xylenes (total)	2.0	< 2.0	--	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	1.0	< 1.0	--	--	--
1,2-Dichlorobenzene	1.7	< 1.7	--	--	--
1,3-Dichlorobenzene	1.7	< 1.7	--	--	--
1,4-Dichlorobenzene	1.7	< 1.7	--	--	--
Methyl tert-Butyl Ether	1.0	< 1.0	--	--	--
Detection Limit Multiplier[b]		1	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, Table 2, US EPA November 1986; sample prepared by EPA Method 5030. Method modified to include additional compounds. Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

ANALYTICAL RESULTS

Aromatic Volatile Organics in Soil
Modified EPA Method 8020[a]

GTEL Sample Number		020523-01	020523-02	020523-07	--
Client Identification		MW-24 8-10'	MW-24 10-12'	MW-26 8-10'	--
Date Sampled		02/16/93	02/16/93	02/17/93	--
Date Analyzed		02/25/93	02/25/93	02/25/93	--
Analyte	Reporting Limit, mg/kg	Concentration, mg/kg (dry)			
Benzene	0.05	< 0.05	< 0.05	< 0.05	--
Toluene	0.05	< 0.05	< 0.05	< 0.05	--
Ethylbenzene	0.10	< 0.10	< 0.10	< 0.10	--
Xylenes (total)	0.20	**0.22**	< 0.20	< 0.20	--
BTEX (total)	--	**0.22**	--	--	--
Chlorobenzene	0.10	< 0.10	< 0.10	< 0.10	--
1,2-Dichlorobenzene	0.10	< 0.10	< 0.10	**0.22**	--
1,3-Dichlorobenzene	0.10	< 0.10	< 0.10	< 0.10	--
1,4-Dichlorobenzene	0.10	< 0.10	< 0.10	**0.43**	--
Sample Dilution Factor[b]		1.15	1.15	1.18	--
Percent Solids		83.2	86.0	86.8	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Methanolic extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The sample dilution factor indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

SURROGATE RECOVERY RESULTS

Volatile Organics in Soil
(Trifluorotoluene)
EPA Method 8020

Sample	Amount Added, ug/L	Surrogate Recovery, %
BS02239320B	95.2	70.0
020523-02	95.2	68.2
020523-07	95.2	67.4
020523-01	95.2	67.6
MS020523-04	95.2	71.4
MD020523-04	95.2	69.6

Acceptability Limits[a] 26-125%

a Laboratory generated acceptability limits updated 05/28/92.
MS Matrix Spike.
MD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

MATRIX SPIKE (MS) AND MATRIX SPIKE DUPLICATE (MSD) SUMMARY
PERCENT RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)

Volatile Organics in Soil
EPA Method 8020

Sample Spiked: 020523-04 Client ID: BATCH QC

Date of Analysis: 02/25/93 Standard ID: BX93SM0057

Analyte	Spike Added, mg/kg	Sample Concentration, mg/kg	MS Concentration, mg/kg	MS Percent Recovery	Acceptability Limits, % Rec.[a]
Benzene	62.51	< 0.05	54.15	87	40-160
Toluene	67.04	< 0.05	54.20	81	40-160
Ethylbenzene	67.17	< 0.10	57.33	85	40-160
Total Xylenes	202.40	< 0.20	168.50	83	40-160

Analyte	Spike Added, mg/kg	MSD Concentration, mg/kg	MSD Percent Recovery	RPD, %	Acceptability Limits[a]	
					RPD	% Recovery
Benzene	60.38	56.19	93	7	40	40-160
Toluene	64.75	56.25	87	7	40	40-160
Ethylbenzene	64.88	59.41	91	7	40	40-160
Total Xylenes	195.51	174.38	78	7	40	40-160

* Indicates values outside of acceptability limits.
a Acceptability limits as per laboratory practice.
NA Not Applicable. % Recovery is not calculated when sample results exceed five times the spike concentration.

GTFL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

METHOD BLANK RESULTS

Aromatic Volatile Organics in Soil
Modified EPA Method 8020[a]

GTEL Sample Number		BS02239320B	--	--	--
Client Identification		METHOD BLANK	--	--	--
Date Analyzed		02/25/93	--	--	--
Analyte	Reporting Limit, mg/kg	Concentration, mg/kg (dry)			
Benzene	0.05	< 0.05	--	--	--
Toluene	0.05	< 0.05	--	--	--
Ethylbenzene	0.10	< 0.10	--	--	--
Xylenes (total)	0.20	< 0.20	--	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.10	< 0.10	--	--	--
1,2-Dichlorobenzene	0.10	< 0.10	--	--	--
1,3-Dichlorobenzene	0.10	< 0.10	--	--	--
1,4-Dichlorobenzene	0.10	< 0.10	--	--	--
Sample Dilution Factor[b]		1	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Methanolic extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The sample dilution factor indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

ANALYTICAL RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		020523-14	020523-15	--	--
Client Identification		EQUIP-MENT BLANK	TRIP BLANK	--	--
Date Sampled		02/19/93	02/19/93	--	--
Date Analyzed		02/26/93	02/26/93	--	--
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.2	< 0.2	< 0.2	--	--
Toluene	0.5	< 0.5	< 0.5	--	--
Ethyl Benzene	0.8	< 0.8	< 0.8	--	--
Xylenes (total)	1.7	< 1.7	< 1.7	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.2	< 0.2	< 0.2	--	--
1,2-Dichlorobenzene	0.4	< 0.4	< 0.4	--	--
1,3-Dichlorobenzene	0.4	< 0.4	< 0.4	--	--
1,4-Dichlorobenzene	0.3	< 0.3	< 0.3	--	--
Detection Limit Multiplier[b]		1	1	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

SURROGATE RECOVERY RESULTS

Aromatic Volatile Organics in Water
(Trifluorotoluene)
Modified EPA Method 8020

Sample	Amount Added, ug/L	Surrogate Recovery, %
BW02269319B	95.2	96.4
020523-15	95.2	89.5
020523-14	95.2	92.0

Acceptability Limits[a] 45-125%

a Laboratory generated acceptability limits updated 07/11/91.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

METHOD BLANK RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		BW02269319B	--	--	--
Client Identification		METHOD BLANK	--	--	--
Date Analyzed		02/26/93	--	--	--
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.2	< 0.2	--	--	--
Toluene	0.5	< 0.5	--	--	--
Ethyl Benzene	0.8	< 0.8	--	--	--
Xylenes (total)	1.7	< 1.7	--	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.2	< 0.2	--	--	--
1,2-Dichlorobenzene	0.4	< 0.4	--	--	--
1,3-Dichlorobenzene	0.4	< 0.4	--	--	--
1,4-Dichlorobenzene	0.3	< 0.3	--	--	--
Detection Limit Multiplier[b]		1	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		020523-01	020523-02	020523-03	020523-04
Client Identification		MW-24 8-10'	MW-24 10-12'	MW-24 18-20'	MW-23 6-8'
Date Sampled		02/16/93	02/16/93	02/16/93	02/17/93
Date Extracted		02/25/93	02/25/93	02/25/93	02/25/93
Date Analyzed		03/09/93[c]	03/09/93[d]	03/09/93	03/09/93
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	**790 X**	**1200**	< 73	< 77
Acenaphthylene	77	< 92	< 89	< 93	< 99
1-Methylnaphthalene	60	**800**	**910**	< 73	< 77
2-Methylnaphthalene	60	**700**	**2400**	< 73	< 77
Acenaphthene	60	**150**	**310**	< 73	< 77
Fluorene	7.0	**180 X**	**290**	< 8.5	< 9.0
Phenanthrene	21	**600[c]**	**850[d]**	< 25	< 27
Anthracene	22	**210**	**1100[d]**	< 27	< 28
Fluoranthene	7.0	**160 Y**	**210**	< 8.5	< 9.0
Pyrene	9.0	**110**	**110**	< 11	< 12
Benzo[*a*]anthracene	0.43	**25**	**27**	**1.5**	< 0.55
Chrysene	5.0	**23**	**42**	< 6.1	< 6.4
Benzo[*b*]fluoranthene	0.60	**17**	**14**	**2.2**	**4.5**
Benzo[*k*]fluoranthene	0.57	**6.4**	**6.1**	**1.2**	< 0.73
Benzo[*a*]pyrene	0.77	**14**	**11**	**1.7**	< 0.99
Dibenzo[*a,h*]anthracene	1.0	< 1.2	< 1.2	< 1.2	< 1.3
Benzo[*g,h,i*]perylene	2.5	**18**	**8.6**	< 3.0	< 3.2
Indeno[1,2,3-*cd*]pyrene	1.4	**7.2**	**4.6**	< 1.7	< 1.8
Detection Limit Multiplier[b]		1.20c	1.16[d]	1.21	1.28
Percent Solids, %		83.2	86.0	82.4	77.9

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.
b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.
c Detection Limit Multiplier for analyte noted = 12.0, Date Analyzed = 03/12/93.
d Detection Limit Multiplier for analytes noted = 11.6, Date Analyzed = 03/12/93.
X Estimated concentration. Matrix spike recovery for this analyte demonstrate matrix effect.
Y Estimated Concentration. Sample imprecision demonstrated for this analyte.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		020523-05	020523-06	020523-07	020523-08
Client Identification		MW-23 16-18'	MW-23 18-20'	MW-26 8-10'	MW-26 10-12'
Date Sampled		02/17/93	02/17/93	02/17/93	02/17/93
Date Extracted		02/25/93	02/25/93	02/25/93	02/25/93
Date Analyzed		03/09/93	03/09/93	03/09/93	03/09/93
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	< 71	< 73	< 69	< 69
Acenaphthylene	77	< 92	< 94	< 89	< 89
1-Methylnaphthalene	60	< 71	< 73	**210**	< 69
2-Methylnaphthalene	60	< 71	< 73	< 69	< 69
Acenaphthene	60	< 71	< 73	< 69	< 69
Fluorene	7.0	< 8.3	< 8.5	**21**	< 8.1
Phenanthrene	21	< 25	< 26	**230**	< 24
Anthracene	22	< 26	< 27	**60**	< 25
Fluoranthene	7.0	< 8.3	< 8.5	**30**	< 8.1
Pyrene	9.0	< 11	< 11	< 10	< 10
Benzo[*a*]anthracene	0.43	< 0.51	< 0.52	**16**	< 0.49
Chrysene	5.0	< 6.0	< 6.1	**27**	< 5.8
Benzo[*b*]fluoranthene	0.60	< 0.71	< 0.73	**16**	< 0.69
Benzo[*k*]fluoranthene	0.57	< 0.68	< 0.70	**3.7**	< 0.66
Benzo[*a*]pyrene	0.77	< 0.92	< 0.94	**12**	< 0.89
Dibenzo[*a,h*]anthracene	1.0	< 1.2	< 1.2	**1.6**	< 1.2
Benzo[*g,h,i*]perylene	2.5	< 3.0	< 3.1	**30**	< 2.9
Indeno[1,2,3-*cd*]pyrene	1.4	< 1.7	< 1.7	**7.9**	< 1.6
Detection Limit Multiplier[b]		1.19	1.22	1.15	1.15
Percent Solids, %		83.6	81.6	86.8	86.9

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		020523-09	020523-10	020523-11	020523-12
Client Identification		MW-26 18-20'	MW-22 4-6'	MW-22 10-12'	MW-22 23-25'
Date Sampled		02/17/93	02/18/93	02/18/93	02/18/93
Date Extracted		02/25/93	02/25/93	02/25/93	02/25/93
Date Analyzed		03/09/93	03/09/93	03/09/93	03/09/93
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	< 74	< 74	< 68	< 68
Acenaphthylene	77	< 95	< 95	< 88	< 87
1-Methylnaphthalene	60	< 74	< 74	< 68	< 68
2-Methylnaphthalene	60	< 74	< 74	< 68	< 68
Acenaphthene	60	< 74	< 74	< 68	< 68
Fluorene	7.0	< 8.7	< 8.6	< 8.0	< 7.9
Phenanthrene	21	< 26	< 26	< 24	< 24
Anthracene	22	< 27	< 27	< 25	< 25
Fluoranthene	7.0	< 8.7	< 8.6	< 8.0	< 7.9
Pyrene	9.0	< 11	< 11	< 10	< 10
Benzo[*a*]anthracene	0.43	< 0.53	< 0.53	< 0.49	< 0.49
Chrysene	5.0	< 6.2	< 6.2	< 5.7	< 5.6
Benzo[*b*]fluoranthene	0.60	< 0.74	1.3	< 0.68	< 0.68
Benzo[*k*]fluoranthene	0.57	< 0.71	< 0.70	< 0.65	< 0.64
Benzo[*a*]pyrene	0.77	< 0.95	< 0.95	< 0.88	< 0.87
Dibenzo[*a,h*]anthracene	1.0	< 1.2	< 1.2	< 1.1	< 1.1
Benzo[*g,h,i*]perylene	2.5	< 3.1	< 3.1	< 2.8	< 2.8
Indeno[1,2,3-*cd*]pyrene	1.4	< 1.7	< 1.7	< 1.6	< 1.6
Detection Limit Multiplier[b]		1.24	1.23	1.14	1.13
Percent Solids, %		80.5	81.0	87.8	88.3

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		020523-13	--	--	--
Client Identification		MW-27 7-9'	--	--	--
Date Sampled		02/19/93	--	--	--
Date Extracted		02/25/93	--	--	--
Date Analyzed		03/09/93	--	--	--
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	< 68	--	--	--
Acenaphthylene	77	< 88	--	--	--
1-Methylnaphthalene	60	< 68	--	--	--
2-Methylnaphthalene	60	< 68	--	--	--
Acenaphthene	60	< 68	--	--	--
Fluorene	7.0	< 8.0	--	--	--
Phenanthrene	21	< 24	--	--	--
Anthracene	22	< 25	--	--	--
Fluoranthene	7.0	< 8.0	--	--	--
Pyrene	9.0	< 10	--	--	--
Benzo[*a*]anthracene	0.43	< 0.49	--	--	--
Chrysene	5.0	< 5.7	--	--	--
Benzo[*b*]fluoranthene	0.60	< 0.68	--	--	--
Benzo[*k*]fluoranthene	0.57	< 0.65	--	--	--
Benzo[*a*]pyrene	0.77	< 0.88	--	--	--
Dibenzo[*a,h*]anthracene	1.0	< 1.1	--	--	--
Benzo[*g,h,i*]perylene	2.5	< 2.8	--	--	--
Indeno[1,2,3-*cd*]pyrene	1.4	< 1.6	--	--	--
Detection Limit Multiplier[b]		1.14	--	--	--
Percent Solids, %		87.3	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

SURROGATE RECOVERY SUMMARY

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310

GTEL Sample ID	Percent Recovery, %	
	S1 (NBZ)	S2 (TPH)
BS0225-1	61	100
020523-01 (03/09/93)	49	95
020523-01 (03/12/93)	43	84
020523-02 (03/09/93)	54	96
020523-02 (03/12/93)	57	97
020523-03	47	75
020523-04	68	81
020523-05	41	87
020523-06	40	82
020523-07	39	107
020523-08	38	90
020523-09	34	62
020523-10	43	74
020523-11	38	94
020523-12	78	90
020523-13	70	85
020523-01 MS (03/09/93)	68	106
020523-01 MS (03/12/93)	70	104
020523-01 MSD (03/09/93)	51	90
020523-01 MSD (03/12/93)	54	89
LS0225-1	73	95

Surrogates			Recovery Limits[a]
S1	NBZ	Nitrobenzene-d5	33-141%
S2	TPH	Terphenyl-d14	33-141%

D Surrogate diluted out. % Recovery not calculated when surrogate diluted out.
* Indicates values outside of acceptability limits.
a Recovery limits as per laboratory practice.
MS Matrix Spike.
MSD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

MATRIX SPIKE (MS) RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: 020523-01 Client ID: BATCH QC

Date Analyzed: 03/09/93 and 03/12/93 Standard ID: H92MS031C

Compound	Spike Added, ug/kg	Sample Concentration, ug/kg	MS Concentration, ug/kg	MS Percent Recovery, %	Acceptability Limits, %
Naphthalene	400	788	1620	208*	Det.-122
Acenaphthylene	800	< 92	599	75	Det.-139
Acenaphthene	400	153	574	105	Det.-124
Fluorene	80.0	177	339	203*	Det.-142
Phenanthrene	40.0	602[a]	1130	NA	Det.-155
Anthracene	40.0	210[a]	291	NA	Det.-126
Fluoranthene	80.0	156	262	133	Det.-142
Pyrene	40.0	110	155	113	Det.-140
Benzo[*a*]anthracene	40.0	25.1	61.1	90	12-135
Chrysene	40.0	23.3	52.7	74	Det.-199
Benzo[*b*]fluoranthene	80.0	16.9	93.1	95	6-150
Benzo[*k*]fluoranthene	40.0	6.37	40.4	85	Det.-159
Benzo[*a*]pyrene	40.0	13.6	50.4	92	Det.-128
Dibenzo[*a,h*]anthracene	80.0	< 1.2	70.8	89	Det.-110
Benzo[*g,h,i*]perylene	80.0	17.7	89.8	90	Det.-116
Indeno[1,2,3-*cd*]pyrene	40.0	7.22	42.8	89	Det.-116

* Values outside of QC limits. See Nonconformance Summary.
a Value reported from analysis on 03/12/93. (DLM = 12)
D Diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration of sample is more than four times that of spike.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: 020523-01 Client ID: BATCH QC

Date Analyzed: 03/09/93 and 03/12/93 Standard ID: H92MS031C

Compound	Spike Added, ug/kg	MSD Concentration, ug/kg	MSD Percent Recovery, %	RPD, %	Acceptability Limits: RPD, %
Naphthalene	400	1390	150*	32	60
Acenaphthylene	801	493	62	20	60
Acenaphthene	400	484	83	24	60
Fluorene	80.1	291	142	35	60
Phenanthrene	40.0	865[a]	NA	27[b]	60
Anthracene	40.0	302	NA	4[b]	60
Fluoranthene	80.1	208	65	68*	60
Pyrene	40.0	158	120	6	60
Benzo[*a*]anthracene	40.0	56.0	77	15	60
Chrysene	40.0	46.5	58	24	60
Benzo[*b*]Fluoranthene	80.1	81.1	80	17	60
Benzo[*k*]fluoranthene	40.0	34.1	69	21	60
Benzo[*a*]pyrene	40.0	44.2	76	19	60
Dibenzo[*a,h*]anthracene	80.1	57.0	71	22	60
Benzo[*g,h,i*]perylene	80.1	79.2	77	16	60
Indeno[1,2,3-*cd*]pyrene	40.0	38.8	79	12	60

* Values outside of QC limits. See Nonconformance Summary.
a Value reported from analysis on 03/12/93. (DLM = 12)
b RPD calculation is based on concentration.
D Diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration of sample is more than four times that of spike.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

LABORATORY CONTROL SAMPLE (LCS) RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: LS0225-1

Standard ID: H92MS031C Date Analyzed: 03/09/93

Compound	Spike Added, ug/kg	LCS Concentration, ug/kg	LCS Percent Recovery, %
Naphthalene	333	290	87
Acenaphthylene	666	616	92
Acenaphthene	333	321	96
Fluorene	66.6	66.3	95
Phenanthrene	33.3	26.9	81
Anthracene	33.3	27.8	83
Fluoranthene	66.6	58.9	88
Pyrene	33.3	31.8	95
Benzo[a]anthracene	33.3	27.9	84
Chrysene	33.3	26.1	78
Benzo[*b*]fluoranthene	66.6	60.4	91
Benzo[*k*]fluoranthene	33.3	29.9	90
Benzo[a]pyrene	33.3	28.5	86
Dibenzo[*a,h*]anthracene	66.6	61.2	92
Benzo{*g,h,i*]perylene	66.6	54.8	82
Indeno[1,2,3-*cd*]pyrene	33.3	31.1	93

* Values outside of QC limits.
D Diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration of sample is more than four times that of spike.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

METHOD BLANK RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

	GTEL Blank ID	BS0225-1
	GTEL File ID	BS02251
	Date Extracted	02/25/93
	Date Analyzed	03/09/93
Analyte	Detection Limit, ug/kg	Concentration, ug/kg
Naphthalene	60	< 60
Acenaphthylene	77	< 77
1-Methylnaphthalene	60	< 60
2-Methylnaphthalene	60	< 60
Acenaphthene	60	< 60
Fluorene	7.0	< 7.0
Phenanthrene	21	< 21
Anthracene	22	< 22
Fluoranthene	7.0	< 7.0
Pyrene	9.0	< 9.0
Benzo[*a*]anthracene	0.43	< 0.43
Chrysene	5.0	< 5.0
Benzo[*b*]fluoranthene	0.60	< 0.60
Benzo[*k*]fluoranthene	0.57	< 0.57
Benzo[*a*]pyrene	0.77	< 0.77
Dibenzo[*a,h*]anthracene	1.0	< 1.0
Benzo[*g,h,i*]perylene	2.5	< 2.5
Indeno[1,2,3-*cd*]pyrene	1.4	< 1.4
Detection Limit Multiplier[b]		0.998

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

GTEL Sample Number		020523-14	--	--	--
Client Identification		EQUIP-MENT BLANK	--	--	--
Date Sampled		02/19/93	--	--	--
Date Extracted		02/23/93	--	--	--
Date Analyzed		03/04/93	--	--	--
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Naphthalene	1.8	< 1.8	--	--	--
Acenaphthylene	2.3	< 2.3	--	--	--
1-Methylnaphthalene	1.8	< 1.8	--	--	--
2-Methylnaphthalene	1.8	< 1.8	--	--	--
Acenaphthene	1.8	< 1.8	--	--	--
Fluorene	0.21	< 0.21	--	--	--
Phenanthrene	0.64	< 0.64	--	--	--
Anthracene	0.66	< 0.66	--	--	--
Fluoranthene	0.21	< 0.21	--	--	--
Pyrene	0.27	< 0.27	--	--	--
Benzo[*a*]anthracene	0.013	< 0.013	--	--	--
Chrysene	0.15	< 0.15	--	--	--
Benzo[*b*]fluoranthene	0.018	< 0.018	--	--	--
Benzo[*k*]fluoranthene	0.017	< 0.017	--	--	--
Benzo[*a*]pyrene	0.023	< 0.023	--	--	--
Dibenzo[*a,h*]anthracene	0.030	< 0.030	--	--	--
Benzo[*g,h,i*]perylene	0.076	< 0.076	--	--	--
Indeno[1,2,3-*cd*]pyrene	0.043	< 0.043	--	--	--
Detection Limit Multiplier[b]		1.00	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3510 (liquid-liquid).

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

SURROGATE RECOVERY SUMMARY

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310

GTEL Sample ID	Percent Recovery, %	
	S1 (NBZ)	S2 (TPH)
BW0223-1	103	100
020523-14	88	76

	Surrogates		Recovery Limits[a]
S1	NBZ	Nitrobenzene-d5	33-141%
S2	TPH	Terphenyl-d14	33-141%

D Surrogate diluted out. % Recovery not calculated when surrogate diluted out.
* Indicates values outside of acceptability limits.
a Recovery limits as per laboratory practice.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose Phase II
Login Number: M3-02-0523

METHOD BLANK RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

	GTEL Blank ID	BW0223-1
	GTEL File ID	BW02231
	Date Extracted	02/23/93
	Date Analyzed	03/03/93
Analyte	Detection Limit, ug/L	Concentration, ug/L
Naphthalene	1.8	< 1.8
Acenaphthylene	2.3	< 2.3
1-Methylnaphthalene	1.8	< 1.8
2-Methylnaphthalene	1.8	< 1.8
Acenaphthene	1.8	< 1.8
Fluorene	0.21	< 0.21
Phenanthrene	0.64	< 0.64
Anthracene	0.66	< 0.66
Fluoranthene	0.21	< 0.21
Pyrene	0.27	< 0.27
Benzo[a]anthracene	0.013	< 0.013
Chrysene	0.15	< 0.15
Benzo[*b*]fluoranthene	0.018	< 0.018
Benzo[*k*]fluoranthene	0.017	< 0.017
Benzo[a]pyrene	0.023	< 0.023
Dibenzo[*a,h*]anthracene	0.030	< 0.030
Benzo[*g,h,i*]perylene	0.076	< 0.076
Indeno[1,2,3-*cd*]pyrene	0.043	< 0.043
Detection Limit Multiplier[b]		1.00

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3510 (liquid-liquid).

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

53226

Company Name: GTI Schnecktady
Phone #:
FAX #:
Company Address:
Site location: Buffalo, NY
Project Manager: Bruce Ahrens
Client Project ID: (#) 011105307 6359
(NAME) Ospmose Phase II
Sampler Name (Print): J. Olaf Gustafson

I attest that the proper field sampling procedures were used during the collection of these samples.

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-22 4-6'	16	3		X								X			2/18	9:45
"	↓	2		X								X				↓
MW-22 10-12'	"	3		X								X				10:30
"	↓	2		X								X				↓
MW-22 23-25'	17	3		X								X				11:30
"	↓	2		X								X			↓	↓
MW-27 7-9'	13	2		X								X			2/19	10:15
"	↓	3		X								X			↓	↓
Equipment Blank	14	3	X						X			X			2/19	1:30
"	↓	2	X									X			↓	↓

Field Sample ID	BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
MW-22 4-6'									X	X				X						
"																				
MW-22 10-12'									X	X										
"														X						
MW-22 23-25'									X	X										
"														X						
MW-27 7-9'									X	X										
"																				
Equipment Blank										X				X						
"																				

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ____
Business Days ☐
Project-Specific

Special Handling
GTEL Contact: Brian Wagner
Quote/Contract #: DM92306
Confirmation #:
PO #:

QA / QC LEVEL
BLUE ☒ CLP ☐
OTHER ____

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS

Lab Use Only Lot #
Storage Location:
Work Order # 20-3 F

CUSTODY RECORD

	Date	Time
Relinquished by Sampler: J. Olaf Gustafson	2/19/93	5:00
Relinquished by:		
Relinquished by:	2/20/93	3:40 PM

Received by:
Received by:
Received by Laboratory:
Waybill # 665111214 5

Rev. 7/91

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

54148

Company Name: GTI Schenectady
Phone #:
FAX #:
Company Address:
Site location: Buffalo, NY

Project Manager: Bruce Ahrens
Client Project ID: (#) 011105307 6309
(NAME) Osmose Phase II

I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): J. Olaf Gustafson

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-23 18-20'	6	3		X								X			2/17	10:45
"	↓	2		X								X				↓
MW-26 8-10'	7	3		X								X				2:00
"	↓	2		X								X				↓
MW-26 10-12'	8	3		X								X				2:15
"	↓	2		X								X				↓
MW-26 18-20'	9	3		X								X				3:15
"	↓	2		X								X			↓	↓

ANALYSIS REQUESTED

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
									X				X						
													X						
									X				X						
													X						
									X				X						
													X						

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other ☐
Business Days ☐
Project - specific
BLUE ☑ CLP ☐

Special Handling
GTEL Contact: Brian Wagner
Quote/Contract #: QM920306
Confirmation #:
PO #:

QA / QC LEVEL
OTHER

SPECIAL DETECTION LIMITS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

REMARKS

Lab Use Only Lot #: 23KC
Storage Location: WG-E
Work Order #:

	Date	Time
Relinquished by Sampler: Vince Barry	2/18/93	4:00
Relinquished by:	2/20/93	3:00 PM
Relinquished by:		

Received by: WG-E
Received by: Norman Jacquard
Received by Laboratory:
Waybill # 665112134

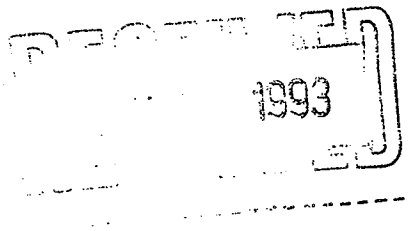
CUSTODY RECORD

Rev. 7/91

JOG

GTEL
ENVIRONMENTAL
LABORATORIES, INC.
Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 005300109
Project ID: Osmose Wood Preserving
Login Number: M3-06-0827



July 19, 1993

Bruce Ahrens
Groundwater Technology, Inc.
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 06/30/93 under chain-of-custody record 52718.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number 10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Susan C. Uhler
Laboratory Director

Client Number: 005300109
Project ID: Osmose Wood Preserving
Login Number: M3-06-0827

CONFORMANCE/NONCONFORMANCE SUMMARY

(X = Requirements Met * = See Comments NA = Not Applicable)

#	Conformance Item	VOA GC	VOA GC/MS	SV GC	SV GC/MS	Metals	Wet Chem
1	GC/MS Tune	NA	--	NA	--	NA	NA
2	Initial Calibration	--	--	X	--	--	--
3	Continuing Calibration	--	--	X	--	--	--
4	Surrogate Recovery	--	--	*	--	NA	NA
5	Holding Time	--	--	X	--	--	--
6	Method Accuracy	--	--	*	--	--	--
7	Method Precision	--	--	X	--	--	--

8 Blank Contamination - List/ND (None Detected)/*(See Comments)

VOA: --
SV: ND
Metals: --
Wet Chem: --

9 Comments:

Method 8310:
The terphenyl surrogate recovery exceeded acceptability limits due to interference from non-target analytes. However, as no targets eluting in this region were detected in the samples, data is not deemed adversely impacted.

The spiked sample (060827-01) contained target analytes at concentrations much higher than the spike added levels. The Laboratory Control Sample (LCS) has been provided to demonstrate instrument and solution control. The data is not impacted.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 005300109
Project ID: Osmose Wood Preserving
Login Number: M3-06-0827

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		060827-01	060827-02	060827-03	060827-04
Client Identification		SS-4	SS-5	SS-6	SS-7
Date Sampled		06/29/93	06/29/93	06/29/93	06/29/93
Date Extracted		07/09/93	07/09/93	07/09/93	07/09/93
Date Analyzed		07/13/93	07/14/93	07/14/93	07/14/93
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	< 2900	< 1400	< 1500	< 1400
Acenaphthylene	77	< 3700	< 1800	< 1900	< 1800
1-Methylnaphthalene	60	< 2900	< 1400	< 1500	< 1400
2-Methylnaphthalene	60	< 2900	< 1400	< 1500	< 1400
Acenaphthene	60	< 2900	< 1400	< 1500	< 1400
Fluorene	7.0	**1400**	**160**	**180**	**410**
Phenanthrene	21	**5200**	**760**	< 530	**1600**
Anthracene	22	< 1000	< 510	< 550	< 520
Fluoranthene	7.0	**5600**	**1400**	**760**	**2300**
Pyrene	9.0	**3600**	**860**	**240**	**1500**
Benzo[*a*]anthracene	0.43	**2400**	**580**	**350**	**1100**
Chrysene	5.0	**2500**	**820**	**490**	**1200**
Benzo[*b*]fluoranthene	0.60	**2000**	**640**	**400**	**1000**
Benzo[*k*]fluoranthene	0.57	**990**	**270**	**170**	**470**
Benzo[*a*]pyrene	0.77	**2100**	**620**	**400**	**1000**
Dibenzo[*a,h*]anthracene	1.0	**450**	**83**	**99**	**250**
Benzo[*g,h,i*]perylene	2.5	**2200**	**590**	**420**	**100**
Indeno[1,2,3-*cd*]pyrene	1.4	**2800**	**910**	**610**	**1400**
Detection Limit Multiplier[b]		47.6	23.4	25.0	23.6
Percent Solids, %		83.8	85.2	80.0	85.0

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 005300109
Project ID: Osmose Wood Preserving
Login Number: M3-06-0827

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

GTEL Sample Number		060827-05	060827-06	--	--
Client Identification		SS-8	SS-9	--	--
Date Sampled		06/29/93	06/29/93	--	--
Date Extracted		07/09/93	07/09/93	--	--
Date Analyzed		07/14/93	07/14/93	--	--
Analyte	Detection Limit, ug/kg	Concentration, ug/kg			
Naphthalene	60	< 1500	< 1400	--	--
Acenaphthylene	77	< 1900	< 1800	--	--
1-Methylnaphthalene	60	< 1500	< 1400	--	--
2-Methylnaphthalene	60	< 1500	< 1400	--	--
Acenaphthene	60	< 1500	< 1400	--	--
Fluorene	7.0	< 170	**330**	--	--
Phenanthrene	21	< 510	**1300**	--	--
Anthracene	22	< 530	< 510	--	--
Fluoranthene	7.0	**570**	**1800**	--	--
Pyrene	9.0	**270**	**1300**	--	--
Benzo[a]anthracene	0.43	**260**	**860**	--	--
Chrysene	5.0	**340**	**1000**	--	--
Benzo[*b*]fluoranthene	0.60	**290**	**850**	--	--
Benzo[*k*]fluoranthene	0.57	**130**	**380**	--	--
Benzo[*a*]pyrene	0.77	**270**	**850**	--	--
Dibenzo[*a,h*]anthracene	1.0	**67**	**23**	--	--
Benzo[*g,h,i*]perylene	2.5	**290**	**860**	--	--
Indeno[1,2,3-*cd*]pyrene	1.4	**430**	**1200**	--	--
Detection Limit Multiplier[b]		24.2	23.4	--	--
Percent Solids, %		82.6	85.6	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 005300109
Project ID: Osmose Wood Preserving
Login Number: M3-06-0827

SURROGATE RECOVERY SUMMARY

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310

GTEL Sample ID	Percent Recovery, %	
	S1 (NBZ)	S2 (TPH)
BS0709-1	63	93
LS0709-1	66	84
060827-01	76	318*
060827-01 MS	80	150*
060827-01 MSD	107	217*
060827-02	100	114
060827-03	95	104
060827-04	93	144*
060827-05	80	78
060827-06	80	138

Recovery Limits[a]
33-141%
33-141%

Surrogates
S1 NBZ Nitrobenzene-d5
S2 TPH Terphenyl-d14
D Surrogate diluted out. % Recovery not calculated when surrogate diluted out.
* Indicates values outside of acceptability limits. See Nonconformance Summary.
a Recovery limits as per laboratory practice.
MS Matrix Spike.
MSD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 005300109
Project ID: Osmose Wood Preserving
Login Number: M3-06-0827

MATRIX SPIKE (MS) RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: 060827-01 Client ID: BATCH QC

Date Analyzed: 07/13/93 Standard ID: H93MS065A

Compound	Spike Added, ug/kg	Sample Concentration, ug/kg	MS Concentration, ug/kg	MS Percent Recovery, %	Acceptability Limits, %
Naphthalene	398	< 2900	619	D	Det.-122
Acenaphthylene	795	< 3700	D	D	Det.-139
Acenaphthene	398	< 2900	365	D	Det.-124
Fluorene	79.5	1390	885	NA	Det.-142
Phenanthrene	39.8	5200	1690	NA	Det.-155
Anthracene	39.8	< 1000	D	D	Det.-126
Fluoranthene	79.5	5610	2470	NA	Det.-142
Pyrene	39.8	3560	1440	NA	Det.-140
Benzo[a]anthracene	39.8	2400	1070	NA	12-135
Chrysene	39.8	2510	1310	NA	Det.-199
Benzo[*b*]fluoranthene	79.5	2050	1140	NA	6-150
Benzo[*k*]fluoranthene	39.8	990	503	NA	Det.-159
Benzo[a]pyrene	39.8	2150	1060	NA	Det.-128
Dibenzo[*a,h*]anthracene	79.5	449	368	NA	Det.-110
Benzo[*g,h,i*]perylene	79.5	2170	985	NA	Det.-116
Indeno[1,2,3-*cd*]pyrene	39.8	2780	1490	NA	Det.-116

* Values outside of QC limits.
D Diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration of sample is more than four times that of spike. See Nonconformance Summary.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 005300109
Project ID: Osmose Wood Preserving
Login Number: M3-06-0827

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: 060827-01 Client ID: BATCH QC

Date Analyzed: 07/13/93 Standard ID: H93MS065A

Compound	Spike Added, ug/kg	MSD Concentration, ug/kg	MSD Percent Recovery, %	RPD, %	Acceptability Limits: RPD, %
Naphthalene	397	641	D	3[a]	60
Acenaphthylene	794	D	D	D	60
Acenaphthene	397	378	D	3[a]	60
Fluorene	79.4	1060	NA	31[a]	60
Phenanthrene	39.7	2140	NA	23[a]	60
Anthracene	39.7	D	D	D	60
Fluoranthene	79.4	3100	NA	23[a]	60
Pyrene	39.7	1770	NA	21[a]	60
Benzo[*a*]anthracene	39.7	1410	NA	27[a]	60
Chrysene	39.7	1650	NA	23[a]	60
Benzo[*b*]Fluoranthene	79.4	1390	NA	20[a]	60
Benzo[*k*]fluoranthene	39.7	637	NA	24[a]	60
Benzo[*a*]pyrene	39.7	1340	NA	23[a]	60
Dibenzo[*a,h*]anthracene	79.4	238	NA	43[a]	60
Benzo[*g,h,i*]perylene	79.4	1390	NA	34[a]	60
Indeno[1,2,3-*cd*]pyrene	39.7	1870	NA	23[a]	60

* Values outside of QC limits.
D Diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration of sample is more than four times that of spike. See Nonconformance Summary.
a RPD calculation is based on concentration.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 005300109
Project ID: Osmose Wood Preserving
Login Number: M3-06-0827

LABORATORY CONTROL SAMPLE (LCS) RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: LS0709-1 Client ID: BATCH QC

Date Analyzed: 07/13/93 Standard ID: H93MS065A

Compound	Spike Added, ug/kg	LCS Concentration, ug/kg	LCS Percent Recovery, %
Naphthalene	333	259	78
Acenaphthylene	667	521	78
Acenaphthene	333	283	85
Fluorene	66.7	56.9	85
Phenanthrene	33.3	26.8	80
Anthracene	33.3	23.1	69
Fluoranthene	66.7	58.1	87
Pyrene	33.3	25.7	77
Benzo[*a*]anthracene	33.3	28.9	87
Chrysene	33.3	24.5	74
Benzo[*b*]fluoranthene	66.7	65.0	98
Benzo[*k*]fluoranthene	33.3	32.4	97
Benzo[*a*]pyrene	33.3	26.8	80
Dibenzo[*a,h*]anthracene	66.7	60.6	91
Benzo{*g,h,i*]perylene	66.7	58.9	88
Indeno[1,2,3-*cd*]pyrene	33.3	32.9	99

* Values outside of QC limits.
D Diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration of sample is more than four times that of spike.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 005300109
Project ID: Osmose Wood Preserving
Login Number: M3-06-0827

METHOD BLANK RESULTS

Polynuclear Aromatic Hydrocarbons in Soil
EPA Method 8310[a]

	GTEL Blank ID	BS0709-1
	GTEL File ID	BS07091
	Date Extracted	07/09/93
	Date Analyzed	07/13/93
Analyte	Detection Limit, ug/kg	Concentration, ug/kg
Naphthalene	60	< 60
Acenaphthylene	77	< 77
1-Methylnaphthalene	60	< 60
2-Methylnaphthalene	60	< 60
Acenaphthene	60	< 60
Fluorene	7.0	< 7.0
Phenanthrene	21	< 21
Anthracene	22	< 22
Fluoranthene	7.0	< 7.0
Pyrene	9.0	< 9.0
Benzo[*a*]anthracene	0.43	< 0.43
Chrysene	5.0	< 5.0
Benzo[*b*]fluoranthene	0.60	< 0.60
Benzo[*k*]fluoranthene	0.57	< 0.57
Benzo[*a*]pyrene	0.77	< 0.77
Dibenzo[*a,h*]anthracene	1.0	< 1.0
Benzo[*g,h,i*]perylene	2.5	< 2.5
Indeno[1,2,3-*cd*]pyrene	1.4	< 1.4
Detection Limit Multiplier[b]		0.999

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3550 (low level sonication). Results are reported on a dry weight basis.

b The detection limit multiplier indicates the adjustments made to the data and detection limits as a result of dilutions and percent solids.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

52718

Company Name: GTI

Phone #: (518) 370-5631

FAX #: (518) 370-5864

Company Address: 1245 KINGS ROAD SCHENECTADY, NY

Site location: BUFFALO, NY

Project Manager: BRUCE AHRENS

Client Project ID: (#) 00530-0104

(NAME) OSMOSE WOOD PRESERVING

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): BRIAN CAREY

Field Sample ID Old ID / New ID*	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME	BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☐	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	EPA 8310
SS-1 SS-4	1	2		2								X			6/29	10:00																			2
SS-2 SS-5	2	2		2								X			6/29	10:10																			2
SS-3 SS-6	3	2		2								X			6/29	10:20																			2
SS-4 SS-7	4	2		2								X			6/29	10:30																			2
SS-5 SS-8	5	2		2								X			6/29	10:40																			2
SS-6 SS-9	6	2		2								X			6/29	10:50																			2
	7																																		
	8																																		

* New ID #s were assigned to avoid confusion with previous samples

TAT — Special Handling (SOW)

- Priority (24 hr) ☐
- Expedited (48 hr) ☐
- 7 Business Days ☐
- Other ____
- Business Days ☐

GTEL Contact: ____
Quote/Contract #: ____
Confirmation #: ____
PO #: ____

QA / QC LEVEL

BLUE ☐ CLP ☐ OTHER ____

SPECIAL DETECTION LIMITS: PROJECT-SPECIFIC BLUE-LEVEL QA/QC

SPECIAL REPORTING REQUIREMENTS

FAX ☐

REMARKS: THIS IS AN R&D JOB NUMBER

Lab Use Only Lot #

Storage Location: W3A

Work Order #

CUSTODY RECORD

	Date	Time
Relinquished by Sampler:	6/29/93	13:00
Relinquished by:		
Relinquished by:	6/30/93	12:35

Received by:

Received by:

Received by Laboratory:

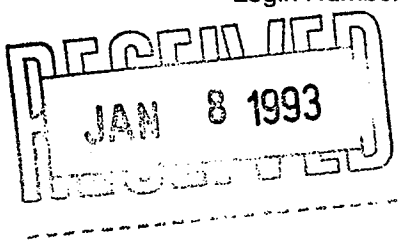
Waybill # 692778274 6

Rev. 7/91

GTEL
ENVIRONMENTAL
LABORATORIES, INC.

Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 011105307
Project ID: Osmose
Login Number: M2-12-0520



January 6, 1993

Bruce Ahrens
Groundwater Technology, Inc.
80 Holtz Road, Suite 107
Cheektowaga, NY 14225

Dear Mr. Ahrens:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 12/19/92 under chain-of-custody records 04312 and 04313.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number 10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Lynn Sullivan for SC

Susan C. Uhler
Laboratory Director

Client Number: 011105307
Project ID: Osmose
Login Number: M2-12-0520

ANALYTICAL RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		120520-01	120520-02	120520-03	120520-04
Client Identification		MW20	MW21	FIELD BLANK	TRIP BLANK
Date Sampled		12/18/92	12/18/92	12/18/92	12/18/92
Date Analyzed		12/22/92	12/22/92	12/22/92	12/22/92
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Toluene	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethyl Benzene	0.8	< 0.8	< 0.8	< 0.8	< 0.8
Xylenes (total)	1.7	< 1.7	< 1.7	< 1.7	< 1.7
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,3-Dichlorobenzene	0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,4-Dichlorobenzene	0.3	< 0.3	< 0.3	< 0.3	< 0.3
Detection Limit Multiplier[b]		1	1	1	1

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M2-12-0520

ANALYTICAL RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		120520-05	120520-06	120520-07	120520-08
Client Identification		CW1	MW8	MW9	MW10
Date Sampled		12/18/92	12/18/92	12/18/92	12/18/92
Date Analyzed		12/22/92	12/22/92	12/22/92	12/22/92
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.2	**9.8**	< 0.2	**230**	< 0.2
Toluene	0.5	**1.4**	< 0.5	**150**	< 0.5
Ethyl Benzene	0.8	< 0.8	< 0.8	**31**	< 0.8
Xylenes (total)	1.7	**3.5**	< 1.7	**150**	< 1.7
BTEX (total)	--	**15**	--	**560**	--
Chlorobenzene	0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	0.4	**3.9**	< 0.4	**15**	< 0.4
1,3-Dichlorobenzene	0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,4-Dichlorobenzene	0.3	< 0.3	< 0.3	< 0.3	< 0.3
Detection Limit Multiplier[b]		1	1	1	1

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M2-12-0520

ANALYTICAL RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		120520-09	120520-10	120520-11	120520-12
Client Identification		MW11	MW12	MW14	MW15
Date Sampled		12/18/92	12/18/92	12/18/92	12/18/92
Date Analyzed		12/22/92	12/22/92	12/22/92	12/22/92
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.2	< 0.2	< 0.2	< 0.2	**110**
Toluene	0.5	< 0.5	< 0.5	< 0.5	**210**
Ethyl Benzene	0.8	< 0.8	< 0.8	< 0.8	**40**
Xylenes (total)	1.7	< 1.7	< 1.7	< 1.7	**530**
BTEX (total)	--	--	--	--	**890**
Chlorobenzene	0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	0.4	< 0.4	< 0.4	< 0.4	**440**
1,3-Dichlorobenzene	0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,4-Dichlorobenzene	0.3	< 0.3	< 0.3	< 0.3	< 0.3
Detection Limit Multiplier[b]		1	1	1	1

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M2-12-0520

ANALYTICAL RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		120520-13	120520-14	--	--
Client Identification		MW17	MW19	--	--
Date Sampled		12/18/92	12/18/92	--	--
Date Analyzed		12/22/92	12/22/92	--	--
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.2	**190**	**0.6**	--	--
Toluene	0.5	**330**	**0.9**	--	--
Ethyl Benzene	0.8	**65**	< 0.8	--	--
Xylenes (total)	1.7	**930**	< 1.7	--	--
BTEX (total)	--	**1500**	**1.5**	--	--
Chlorobenzene	0.2	< 0.2	< 0.2	--	--
1,2-Dichlorobenzene	0.4	**720**	< 0.4	--	--
1,3-Dichlorobenzene	0.4	< 0.4	< 0.4	--	--
1,4-Dichlorobenzene	0.3	< 0.3	< 0.3	--	--
Detection Limit Multiplier[b]		1	1	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M2-12-0520

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

GTEL Sample Number		120520-01	120520-02	120520-03	120520-05
Client Identification		MW20	MW21	FIELD BLANK	CW1
Date Sampled		12/18/92	12/18/92	12/18/92	12/18/92
Date Extracted		12/23/92	12/23/92	12/23/92	12/23/92
Date Analyzed		12/29/92	12/29/92	12/29/92	12/29/92
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Naphthalene	1.8	< 1.8	< 1.8	< 1.8	**89**
Acenaphthylene	2.3	< 2.3	< 2.3	< 2.3	< 46
1-Methylnaphthalene	1.8	< 1.8	< 1.8	< 1.8	< 36
2-Methylnaphthalene	1.8	< 1.8	**2.4**	< 1.8	**46**
Acenaphthene	1.8	< 1.8	< 1.8	< 1.8	< 36
Fluorene	0.21	< 0.21	< 0.21	< 0.21	**6.3**
Phenanthrene	0.64	< 0.64	< 0.64	< 0.64	< 13
Anthracene	0.66	< 0.66	< 0.66	< 0.66	< 13
Fluoranthene	0.21	< 0.21	< 0.21	< 0.21	**25**
Pyrene	0.27	< 0.27	< 0.27	< 0.27	**14**
Benzo[*a*]anthracene	0.013	< 0.013	< 0.013	< 0.013	**5.9**
Chrysene	0.15	< 0.15	< 0.15	< 0.15	**11**
Benzo[*b*]fluoranthene	0.018	< 0.018	**0.021**	< 0.018	**11**
Benzo[*k*]fluoranthene	0.017	< 0.017	< 0.017	< 0.017	**4.7**
Benzo[*a*]pyrene	0.023	< 0.023	< 0.023	< 0.023	**8.2**
Dibenzo[*a,h*]anthracene	0.030	< 0.030	< 0.030	< 0.030	**0.72**
Benzo[*g,h,i*]perylene	0.076	< 0.076	< 0.076	< 0.076	**6.2**
Indeno[1,2,3-*cd*]pyrene	0.043	< 0.043	< 0.043	< 0.043	**8.8**
Detection Limit Multiplier[b]		1.00	1.00	1.00	20.0

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3510 (liquid-liquid).

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M2-12-0520

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

GTEL Sample Number		120520-06	120520-07	120520-08	120520-09
Client Identification		MW8	MW9	MW10	MW11
Date Sampled		12/18/92	12/18/92	12/18/92	12/18/92
Date Extracted		12/23/92	12/23/92	12/23/92	12/23/92
Date Analyzed		12/29/92	12/29/92	12/29/92	12/29/92
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Naphthalene	1.8	< 1.8	< 1.8	< 1.8	< 1.8
Acenaphthylene	2.3	< 2.3	< 2.3	< 2.3	< 2.3
1-Methylnaphthalene	1.8	< 1.8	< 1.8	< 1.8	< 1.8
2-Methylnaphthalene	1.8	< 1.8	< 1.8	< 1.8	< 1.8
Acenaphthene	1.8	< 1.8	< 1.8	< 1.8	< 1.8
Fluorene	0.21	< 0.21	< 0.21	< 0.21	< 0.21
Phenanthrene	0.64	< 0.64	< 0.64	< 0.64	< 0.64
Anthracene	0.66	< 0.66	< 0.66	< 0.66	< 0.66
Fluoranthene	0.21	**1.2**	< 0.21	< 0.21	< 0.21
Pyrene	0.27	< 0.27	< 0.27	< 0.27	< 0.27
Benzo[*a*]anthracene	0.013	**0.21**	< 0.013	**0.016**	**0.056**
Chrysene	0.15	**0.48**	< 0.15	< 0.15	< 0.15
Benzo[*b*]fluoranthene	0.018	**0.47**	< 0.018	**0.021**	**0.087**
Benzo[*k*]fluoranthene	0.017	**0.20**	< 0.017	< 0.017	**0.038**
Benzo[*a*]pyrene	0.023	**0.31**	< 0.023	**0.026**	**0.061**
Dibenzo[*a,h*]anthracene	0.030	**0.059**	< 0.030	< 0.030	< 0.030
Benzo[*g,h,i*]perylene	0.076	**0.20**	< 0.076	< 0.076	< 0.076
Indeno[1,2,3-*cd*]pyrene	0.043	**0.33**	< 0.043	< 0.043	**0.080**
Detection Limit Multiplier[b]		1.00	1.00	1.00	1.00

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3510 (liquid-liquid).

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M2-12-0520

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

GTEL Sample Number		120520-10	120520-11	120520-12	120520-13
Client Identification		MW12	MW14	MW15	MW17
Date Sampled		12/18/92	12/18/92	12/18/92	12/18/92
Date Extracted		12/23/92	12/23/92	12/23/92	12/23/92
Date Analyzed		12/29/92	12/29/92[c]	12/29/92	12/29/92[cd]
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Naphthalene	1.8	< 1.8	**4200**[c]	< 1.8	**11000**[d]
Acenaphthylene	2.3	< 2.3	**110**	< 2.3	**260**[c]
1-Methylnaphthalene	1.8	< 1.8	**170**[c]	< 1.8	**290**[c]
2-Methylnaphthalene	1.8	< 1.8	**660**[c]	< 1.8	**1100**[c]
Acenaphthene	1.8	< 1.8	**240**[c]	< 1.8	**330**[c]
Fluorene	0.21	< 0.21	**91**[c]	**0.22**	**130**[c]
Phenanthrene	0.64	< 0.64	**66**[c]	< 0.64	**110**[c]
Anthracene	0.66	< 0.66	**13**[c]	< 0.66	**30**[c]
Fluoranthene	0.21	**0.37**	**7.1**	< 0.21	**10**
Pyrene	0.27	< 0.27	**3.0**	< 0.27	**5.9**
Benzo[*a*]anthracene	0.013	**0.070**	**0.46**	**0.032**	**0.75**
Chrysene	0.15	< 0.15	**0.48**	< 0.15	**0.89**
Benzo[*b*]fluoranthene	0.018	**0.12**	**0.23**	**0.033**	**0.23**
Benzo[*k*]fluoranthene	0.017	**0.056**	**0.11**	**0.019**	**0.14**
Benzo[*a*]pyrene	0.023	**0.089**	**0.21**	**0.033**	**0.22**
Dibenzo[*a,h*]anthracene	0.030	< 0.030	< 0.030	< 0.030	< 0.030
Benzo[*g,h,i*]perylene	0.076	< 0.076	< 0.076	< 0.076	< 0.076
Indeno[1,2,3-*cd*]pyrene	0.043	**0.10**	**0.092**	< 0.043	**0.073**
Detection Limit Multiplier[b]		1.00	1.00[c]	1.00	1.00[cd]

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3510 (liquid-liquid).
b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.
c Detection Limit Multiplier for analyte noted = 100; Date Analyzed = 01/04/93.
d Detection Limit Multiplier for analyte noted = 200; Date Analyzed = 01/04/93.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M2-12-0520

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

GTEL Sample Number		120520-14	--	--	--
Client Identification		MW19	--	--	--
Date Sampled		12/18/92	--	--	--
Date Extracted		12/23/92	--	--	--
Date Analyzed		12/29/92	--	--	--
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Naphthalene	1.8	< 1.8	--	--	--
Acenaphthylene	2.3	< 2.3	--	--	--
1-Methylnaphthalene	1.8	< 1.8	--	--	--
2-Methylnaphthalene	1.8	< 1.8	--	--	--
Acenaphthene	1.8	< 1.8	--	--	--
Fluorene	0.21	< 0.21	--	--	--
Phenanthrene	0.64	< 0.64	--	--	--
Anthracene	0.66	< 0.66	--	--	--
Fluoranthene	0.21	**0.34**	--	--	--
Pyrene	0.27	< 0.27	--	--	--
Benzo[a]anthracene	0.013	**0.043**	--	--	--
Chrysene	0.15	< 0.15	--	--	--
Benzo[*b*]fluoranthene	0.018	**0.079**	--	--	--
Benzo[*k*]fluoranthene	0.017	**0.039**	--	--	--
Benzo[*a*]pyrene	0.023	**0.057**	--	--	--
Dibenzo[*a,h*]anthracene	0.030	< 0.030	--	--	--
Benzo[*g,h,i*]perylene	0.076	< 0.076	--	--	--
Indeno[1,2,3-*cd*]pyrene	0.043	**0.060**	--	--	--
Detection Limit Multiplier[b]		1.00	--	--	--

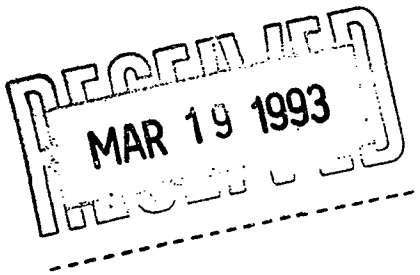
a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3510 (liquid-liquid).

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL
ENVIRONMENTAL
LABORATORIES, INC.
Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 011105307
Project ID: Osmose
Login Number: M3-02-0530



March 17, 1993

Bruce Ahrens
Groundwater Technology, Inc.
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 02/20/93 under chain-of-custody record 51841.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number 10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Lynn Sullivan for SU

Susan C. Uhler
Laboratory Director

Client Number: 011105307
Project ID: Osmose
Login Number: M3-02-0530

CONFORMANCE/NONCONFORMANCE SUMMARY

(X = Requirements Met * = See Comments NA = Not Applicable)

#	Conformance Item	VOA GC	VOA GC/MS	SV GC	SV GC/MS	Metals	Wet Chem
1	GC/MS Tune	NA	--	NA	--	NA	NA
2	Initial Calibration	X	--	X	--	--	--
3	Continuing Calibration	X	--	X	--	--	--
4	Surrogate Recovery	X	--	X	--	NA	NA
5	Holding Time	X	--	X	--	--	--
6	Method Accuracy	X	--	X	--	--	--
7	Method Precision	X	--	X	--	--	--

8 Blank Contamination - List/ND (None Detected)/*(See Comments)
VOA: ND
SV: ND
Metals: --
Wet Chem: --

9 Comments: --

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-02-0530

ANALYTICAL RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		020530-01	020530-02	020530-03	020530-04
Client Identification		CW-1	MW-14	MW-18	MW-19
Date Sampled		02/18/93	02/18/93	02/18/93	02/18/93
Date Analyzed		02/26/93	02/26/93	02/26/93	02/26/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.2	**8.3**	< 0.2	**0.3**	< 0.2
Toluene	0.5	**1.4**	< 0.5	< 0.5	< 0.5
Ethyl Benzene	0.8	< 0.8	< 0.8	< 0.8	< 0.8
Xylenes (total)	1.7	**3.9**	< 1.7	< 1.7	< 1.7
BTEX (total)	--	**14**	--	**0.3**	--
Chlorobenzene	0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,3-Dichlorobenzene	0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,4-Dichlorobenzene	0.3	< 0.3	< 0.3	< 0.3	< 0.3
Detection Limit Multiplier[b]		1	1	1	1

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-02-0530

SURROGATE RECOVERY RESULTS

Aromatic Volatile Organics in Water
(Trifluorotoluene)
Modified EPA Method 8020

Sample	Amount Added, ug/L	Surrogate Recovery, %
BW02269319B	95.2	96.4
020530-01	95.2	90.9
020530-02	95.2	89.7
020530-03	95.2	90.8
020530-04	95.2	91.2
DP020530-01	95.2	86.5
MS020530-02	95.2	86.1

Acceptability Limits[a] 45-125%

a Laboratory generated acceptability limits updated 07/11/91.
MS Matrix Spike.
DP Sample Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-02-0530

MATRIX SPIKE RECOVERY

Aromatic Volatile Organics in Water
Modified EPA Method 8020

Sample Spiked: 020530-02
Date of Analysis: 02/27/93
Standard ID: BX92QC0291R

Client ID: BATCH QC
Matrix: Water

Compound	Sample Results, ug/L	Spike Amount, ug/L	MS Results, ug/L	MS % Percent Recovery	Acceptability Limits, %[a]
Benzene	< 0.20	20.00	18.36	92	39-150
Toluene	< 0.50	20.00	18.27	91	46-148
Ethyl Benzene	< 0.80	20.00	18.51	93	32-160
Total Xylenes	< 1.70	60.00	53.90	90	36-163

a Laboratory generated acceptability limits updated 4/88.
NA Not Applicable; % Recovery is not calculated when original sample amount exceeds five times the spike amount.

DUPLICATE SAMPLE RECOVERY

Aromatic Volatile Organics in Water
Modified EPA Method 8020

Sample Number: 020530-01
Date of Analysis: 02/27/93

Client ID: BATCH QC
Matrix: Water

Compound	Sample Results, ug/L	Duplicate Results, ug/L	RPD, %	Acceptability Limits, %[a]
Benzene	8.34	8.38	0	34
Toluene	1.44	1.31	NA	31
Ethyl Benzene	< 0.80	< 0.80	NA	38
Total Xylenes	3.93	3.78	NA	38

a Laboratory generated acceptability limits updated 4/88.
NA Not Applicable; % RPD is not calculated when sample values are less than 10 times the detection limit.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-02-0530

METHOD BLANK RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		BW02269319B	--	--	--
Client Identification		METHOD BLANK	--	--	--
Date Analyzed		02/26/93	--	--	--
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.2	< 0.2	--	--	--
Toluene	0.5	< 0.5	--	--	--
Ethyl Benzene	0.8	< 0.8	--	--	--
Xylenes (total)	1.7	< 1.7	--	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.2	< 0.2	--	--	--
1,2-Dichlorobenzene	0.4	< 0.4	--	--	--
1,3-Dichlorobenzene	0.4	< 0.4	--	--	--
1,4-Dichlorobenzene	0.3	< 0.3	--	--	--
Detection Limit Multiplier[b]		1	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-02-0530

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

GTEL Sample Number		020530-01	020530-02	020530-03	020530-04
Client Identification		CW	MW-14	MW-18	MW-19
Date Sampled		02/18/93	02/18/93	02/18/93	02/18/93
Date Extracted		02/23/93	02/23/93	02/23/93	02/23/93
Date Analyzed		03/03/93[c]	03/03/93	03/03/93	03/04/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Naphthalene	1.8	**88**[c]	< 1.8	< 1.8	< 1.8
Acenaphthylene	2.3	< 2.3	< 2.3	< 2.3	< 2.3
1-Methylnaphthalene	1.8	**18**	< 1.8	< 1.8	< 1.8
2-Methylnaphthalene	1.8	**69**	< 1.8	< 1.8	< 1.8
Acenaphthene	1.8	**27**	< 1.8	< 1.8	< 1.8
Fluorene	0.21	**8.0**	< 0.21	< 0.21	< 0.21
Phenanthrene	0.64	**4.0**	< 0.64	< 0.64	< 0.64
Anthracene	0.66	< 0.66	< 0.66	< 0.66	< 0.66
Fluoranthene	0.21	**0.92**	< 0.21	**0.53**	< 0.21
Pyrene	0.27	**0.34**	< 0.27	< 0.27	< 0.27
Benzo[*a*]anthracene	0.013	**0.21**	< 0.013	**0.073**	< 0.013
Chrysene	0.15	**0.30**	< 0.15	< 0.15	< 0.15
Benzo[*b*]fluoranthene	0.018	**0.34**	< 0.018	**0.15**	< 0.018
Benzo[*k*]fluoranthene	0.017	**0.14**	< 0.017	**0.068**	< 0.017
Benzo[*a*]pyrene	0.023	**0.25**	< 0.023	**0.10**	< 0.023
Dibenzo[*a,h*]anthracene	0.030	**0.030**	< 0.030	< 0.030	< 0.030
Benzo[*g,h,i*]perylene	0.076	**0.20**	< 0.076	**0.096**	< 0.076
Indeno[1,2,3-*cd*]pyrene	0.043	**0.25**	< 0.043	**0.12**	< 0.043
Detection Limit Multiplier[b]		1.00[c]	1.00	1.00	1.00

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3510 (liquid-liquid).
b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.
c Detection Limit Multiplier for analyte noted = 2.00; Date analyzed = 03/09/93.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-02-0530

SURROGATE RECOVERY SUMMARY

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310

GTEL Sample ID	Percent Recovery, %	
	S1 (NBZ)	S2 (TPH)
BW0223-1	103	100
020530-01 (03/03/93)	90	92
020530-01 (03/09/93)	92	93
020530-02	88	67
020530-03	82	71
020530-04	100	94
020530-01 MS	102	103
020530-01 MSD	89	92

	Surrogates		Recovery Limits[a]
S1	NBZ	Nitrobenzene-d5	33-141%
S2	TPH	Terphenyl-d14	33-141%

D Surrogate diluted out. % Recovery not calculated when surrogate diluted out.
* Indicates values outside of acceptability limits.
a Recovery limits as per laboratory practice.
MS Matrix Spike.
MSD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-02-0530

MATRIX SPIKE (MS) RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: 020530-01 Client ID: BATCH QC

Date Analyzed: 03/03/93 Standard ID: H92MS031C

Compound	Spike Added, ug/L	Sample Concentration, ug/L	MS Concentration, ug/L	MS Percent Recovery, %	Acceptability Limits, %
Naphthalene	20.0	88.4	108	98	D-122
Acenaphthylene	40.0	< 2.3	44.0	110	D-139
Acenaphthene	20.0	26.9	49.7	114	D-124
Fluorene	4.00	8.02	12.9	122	D-142
Phenanthrene	2.00	4.03	6.86	142	D-155
Anthracene	2.00	< 0.66	1.66	83	D-126
Fluoranthene	4.00	0.915	5.53	115	D-142
Pyrene	2.00	0.345	2.94	130	D-140
Benzo[*a*]anthracene	2.00	0.212	2.39	109	12-135
Chrysene	1.86	0.295	2.37	112	D-199
Benzo[*b*]fluoranthene	4.00	0.344	4.56	105	6-150
Benzo[*k*]fluoranthene	2.00	0.145	2.19	102	D-159
Benzo[*a*]pyrene	2.00	0.250	2.44	110	D-128
Dibenzo[*a,h*]anthracene	4.00	0.030	4.35	108	D-110
Benzo[*g,h,i*]perylene	4.00	0.205	4.41	105	D-116
Indeno[1,2,3-*cd*]pyrene	2.00	0.246	2.54	115	D-116

* Values outside of QC limits.
D Diluted out. Percent Recovery and RPD are not calculated when spike compound(s) are diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration is more than four times that of the spike added.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-02-0530

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: 020530-01 Client ID: BATCH QC

Date Analyzed: 03/03/93 Standard ID: H92MS031C

Compound	Spike Added, ug/L	MSD Concentration, ug/L	MSD Percent Recovery, %	RPD, %	Acceptability Limits: RPD, %
Naphthalene	20.0	105	83	17	60
Acenaphthylene	40.0	38.9	97	12	60
Acenaphthene	20.0	46.9	100	13	60
Fluorene	4.00	12.2	105	15	60
Phenanthrene	2.00	6.15	106	29	60
Anthracene	2.00	1.40	70	17	60
Fluoranthene	4.00	4.86	99	16	60
Pyrene	2.00	2.53	109	17	60
Benzo[*a*]anthracene	2.00	2.12	95	13	60
Chrysene	1.86	2.13	99	12	60
Benzo[*b*]Fluoranthene	4.00	4.10	94	12	60
Benzo[*k*]fluoranthene	2.00	1.96	91	12	60
Benzo[*a*]pyrene	2.00	2.18	97	13	60
Dibenzo[*a,h*]anthracene	4.00	3.90	97	11	60
Benzo[*g,h,i*]perylene	4.00	3.99	95	11	60
Indeno[1,2,3-*cd*]pyrene	2.00	2.21	98	16	60

* Values outside of QC limits.
D Diluted out. Percent Recovery and RPD are not calculated when spike compound(s) are diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration is more than four times that of the spike added.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-02-0530

METHOD BLANK RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

	GTEL Blank ID	BW0223-1
	GTEL File ID	BW02231
	Date Extracted	02/23/93
	Date Analyzed	03/03/93
Analyte	Detection Limit, ug/L	Concentration, ug/L
Naphthalene	1.8	< 1.8
Acenaphthylene	2.3	< 2.3
1-Methylnaphthalene	1.8	< 1.8
2-Methylnaphthalene	1.8	< 1.8
Acenaphthene	1.8	< 1.8
Fluorene	0.21	< 0.21
Phenanthrene	0.64	< 0.64
Anthracene	0.66	< 0.66
Fluoranthene	0.21	< 0.21
Pyrene	0.27	< 0.27
Benzo[*a*]anthracene	0.013	< 0.013
Chrysene	0.15	< 0.15
Benzo[*b*]fluoranthene	0.018	< 0.018
Benzo[*k*]fluoranthene	0.017	< 0.017
Benzo[*a*]pyrene	0.023	< 0.023
Dibenzo[*a,h*]anthracene	0.030	< 0.030
Benzo[*g,h,i*]perylene	0.076	< 0.076
Indeno[1,2,3-*cd*]pyrene	0.043	< 0.043
Detection Limit Multiplier[b]		1.00

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 3510 (liquid-liquid).

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

51841

Company Name: Ground Water Tech.
Phone #: (716) 634-1291
FAX #:
Company Address: 80 Holtzdale Cheektowaga, N.Y.
Site location: Buffalo, N.Y.
Project Manager: Bruce Ahrens
Client Project ID: (#) 01110-5367
(NAME) Osmose
Sampler Name (Print): Vince Barry

I attest that the proper field sampling procedures were used during the collection of these samples.

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME	BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
CW-1	1	3	X						X			X			2/18/93	4:20										3									
MW-14	2	3	X						X			X			2/18/93	4:30										3									
MW-18	3	3	X						X			X			2/18/93	4:10										3									
MW-19	4	3	X						X			X			2/18/93	4:00										3									
CW-1	1	2	X									X			2/18/93	4:25														2					
MW-14	2	2	X									X			2/18/93	4:35														2					
MW-18	3	2	X									X			2/18/93	4:15														2					
MW-19	4	2	X									X			2/18/93	4:05														2					

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other NORMAL
Business Days ☐

Special Handling
GTEL Contact BRIAN W.
Quote/Contract # QB920306
Confirmation #
PO #

SPECIAL DETECTION LIMITS

REMARKS

SPECIAL REPORTING REQUIREMENTS

FAX ☐

Lab Use Only Lot #

Storage Location: 21-4B 22KC

Work Order #

QA / QC LEVEL
BLUE ☒ CLP ☐ OTHER

CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: Vince Barry	2/18/93	4:00 pm	Received by:
Relinquished by:			Received by:
Relinquished by:	2/20/93	15:49	Received by Laboratory: Fran Bell

Waybill # 68Y121360 1

Rev. 7/91

GTEL
ENVIRONMENTAL
LABORATORIES, INC.

Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 011105307
Project ID: Osmose
Login Number: M3-03-0341

April 1, 1993

Bruce Ahrens
Groundwater Technology, Inc.
80 Holtz Drive, Suite 107
Cheektowaga, NY 14225

Dear Mr. Ahrens:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 03/12/93 under chain-of-custody record 51845.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number 10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Susan C. Uhler
Laboratory Director

RECEIVED
APR 05 1993

Client Number: 011105307
Project ID: Osmose
Login Number: M3-03-0341

CONFORMANCE/NONCONFORMANCE SUMMARY

(X = Requirements Met * = See Comments NA = Not Applicable)

#	Conformance Item	VOA GC	VOA GC/MS	SV GC	SV GC/MS	Metals	Wet Chem
1	GC/MS Tune	NA	--	NA	--	NA	NA
2	Initial Calibration	X	--	X	--	--	--
3	Continuing Calibration	X	--	X	--	--	--
4	Surrogate Recovery	X	--	X	--	NA	NA
5	Holding Time	X	--	X	--	--	--
6	Method Accuracy	X	--	X	--	--	--
7	Method Precision	X	--	X	--	--	--

8 Blank Contamination - List/ND (None Detected)/*(See Comments)
VOA: ND
SV: ND
Metals: --
Wet Chem: --

9 Comments: --

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-03-0341

ANALYTICAL RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		030341-01	030341-02	030341-03	030341-04
Client Identification		MW-22	MW-23	MW-26	MW-24
Date Sampled		03/10/93	03/10/93	03/10/93	03/10/93
Date Analyzed		03/19/93	03/19/93	03/19/93	03/19/93
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.2	< 0.2	< 0.2	< 0.2	**13**
Toluene	0.5	< 0.5	< 0.5	< 0.5	**15**
Ethyl Benzene	0.8	< 0.8	< 0.8	< 0.8	**38**
Xylenes (total)	1.7	< 1.7	< 1.7	< 1.7	**170**
BTEX (total)	--	--	--	--	**240**
Chlorobenzene	0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,3-Dichlorobenzene	0.4	< 0.4	< 0.4	< 0.4	< 0.4
1,4-Dichlorobenzene	0.3	< 0.3	< 0.3	< 0.3	< 0.3
Detection Limit Multiplier[b]		1	1	1	1

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-03-0341

SURROGATE RECOVERY RESULTS

Aromatic Volatile Organics in Water
(Trifluorotoluene)
Modified EPA Method 8020

Sample	Amount Added, ug/L	Surrogate Recovery, %
BW03189319D	95.2	74.5
030341-01	95.2	68.6
030341-02	95.2	66.7
030341-03	95.2	66.8
030341-04	95.2	67.2
DP030341-01	95.2	63.6
MS030341-02	95.2	65.8

Acceptability Limits[a] 45-125%

a Laboratory generated acceptability limits updated 07/11/91.
MS Matrix Spike.
DUP Sample Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-03-0341

MATRIX SPIKE RECOVERY

Aromatic Volatile Organics in Water
Modified EPA Method 8020

Sample Spiked: 030341-02
Date of Analysis: 03/19/93
Standard ID: BX92QC0291S

Client ID: BATCH QC
Matrix: Water

Compound	Sample Results, ug/L	Spike Amount, ug/L	MS Results, ug/L	MS % Percent Recovery	Acceptability Limits, %[a]
Benzene	< 0.20	20.00	19.27	96	39-150
Toluene	< 0.50	20.00	18.97	95	46-148
Ethyl Benzene	< 0.80	20.00	18.72	94	32-160
Total Xylenes	< 1.70	60.00	52.92	88	36-163

a Laboratory generated acceptability limits updated 4/88.
NA Not Applicable; % Recovery is not calculated when original sample amount exceeds five times the spike amount.

DUPLICATE SAMPLE RECOVERY

Aromatic Volatile Organics in Water
Modified EPA Method 8020

Sample Number: 030341-01
Date of Analysis: 03/19/93

Client ID: BATCH QC
Matrix: Water

Compound	Sample Results, ug/L	Duplicate Results, ug/L	RPD, %	Acceptability Limits, %[a]
Benzene	< 0.20	< 0.20	NA	34
Toluene	< 0.50	< 0.50	NA	31
Ethyl Benzene	< 0.80	< 0.80	NA	38
Total Xylenes	< 1.70	< 1.70	NA	38

a Laboratory generated acceptability limits updated 4/88.
NA Not Applicable; % RPD is not calculated when sample values are less than 10 times the detection limit.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-03-0341

METHOD BLANK RESULTS

Aromatic Volatile Organics in Water
Modified EPA Method 8020[a]

GTEL Sample Number		BW031893-19D	--	--	--
Client Identification		METHOD BLANK	--	--	--
Date Analyzed		03/19/93	--	--	--
Analyte	Detection Limit, ug/L	Concentration, ug/L-			
Benzene	0.2	< 0.2	--	--	--
Toluene	0.5	< 0.5	--	--	--
Ethyl Benzene	0.8	< 0.8	--	--	--
Xylenes (total)	1.7	< 1.7	--	--	--
BTEX (total)	--	--	--	--	--
Chlorobenzene	0.2	< 0.2	--	--	--
1,2-Dichlorobenzene	0.4	< 0.4	--	--	--
1,3-Dichlorobenzene	0.4	< 0.4	--	--	--
1,4-Dichlorobenzene	0.3	< 0.3	--	--	--
Detection Limit Multiplier[b]		1	--	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 5030 (purge and trap). Method modified to include additional compounds.

b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-03-0341

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

GTEL Sample Number		030341-01	030341-02	030341-03	030341-04
Client Identification		MW-22	MW-23	MW-26	MW-24
Date Sampled		03/10/93	03/10/93	03/10/93	03/10/93
Date Extracted		03/16/93	03/16/93	03/16/93	03/16/93
Date Analyzed		03/18/93	03/18/93	03/18/93	03/18/93[c]
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Naphthalene	1.8	< 1.8	< 1.8	< 1.8	**660**[c]
Acenaphthylene	2.3	< 2.3	< 2.3	< 2.3	**2.8**
1-Methylnaphthalene	1.8	< 1.8	< 1.8	< 1.8	**160**[c]
2-Methylnaphthalene	1.8	< 1.8	< 1.8	< 1.8	**170**[c]
Acenaphthene	1.8	< 1.8	< 1.8	< 1.8	**35**
Fluorene	0.21	< 0.21	< 0.21	< 0.21	**18**[c]
Phenanthrene	0.64	< 0.64	< 0.64	< 0.64	**28**[c]
Anthracene	0.66	< 0.66	< 0.66	< 0.66	**5.3**
Fluoranthene	0.21	< 0.21	< 0.21	< 0.21	**5.6**
Pyrene	0.27	< 0.27	< 0.27	< 0.27	**0.95**
Benzo[*a*]anthracene	0.013	< 0.013	**0.023**	**0.024**	**1.0**
Chrysene	0.15	< 0.15	< 0.15	< 0.15	**1.5**
Benzo[*b*]fluoranthene	0.018	< 0.018	**0.037**	**0.044**	**1.1**
Benzo[*k*]fluoranthene	0.017	< 0.017	**0.018**	**0.018**	**0.50**
Benzo[*a*]pyrene	0.023	< 0.023	**0.027**	**0.028**	**1.0**
Dibenzo[*a,h*]anthracene	0.030	< 0.030	< 0.030	< 0.030	**0.11**
Benzo[*g,h,i*]perylene	0.076	< 0.076	< 0.076	< 0.076	**0.55**
Indeno[1,2,3-*cd*]pyrene	0.043	< 0.043	< 0.043	< 0.043	**1.1**
Detection Limit Multiplier[b]		1.00	1.00	1.00	1.00[c]

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 3510 (liquid-liquid).
b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.
c Detection Limit Multiplier for analyte noted = 20.0; Date Analyzed = 03/23/93.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-03-0341

SURROGATE RECOVERY SUMMARY

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310

GTEL Sample ID	Percent Recovery, %	
	S1 (NBZ)	S2 (TPH)
BW0316-1	98	92
030341-01	95	73
030341-02	98	95
030341-03	99	90
030341-04 (03/18/93)	86	105
030341-04 (03/23/93)	85	104
030341-01 MS	101	91
030341-01 MSD	96	84

	Surrogates		Recovery Limits[a]
S1	NBZ	Nitrobenzene-d5	33-141%
S2	TPH	Terphenyl-d14	33-141%

D Surrogate diluted out. % Recovery not calculated when surrogate diluted out.
* Indicates values outside of acceptability limits.
a Recovery limits as per laboratory practice.
MS Matrix Spike.
MSD Matrix Spike Duplicate.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-03-0341

MATRIX SPIKE (MS) RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: 030341-01 Client ID: BATCH QC

Date Analyzed: 03/18/93 Standard ID: H92MS042A

Compound	Spike Added, ug/L	Sample Concentration, ug/L	MS Concentration, ug/L	MS Percent Recovery, %	Acceptability Limits, %
Naphthalene	20.0	< 1.8	18.8	94	Det.-122
Acenaphthylene	40.0	< 2.3	40.1	100	Det.-139
Acenaphthene	20.0	< 1.8	20.3	102	Det.-124
Fluorene	4.00	< 0.21	3.95	99	Det.-142
Phenanthrene	2.00	< 0.64	1.56	78	Det.-155
Anthracene	2.00	< 0.66	1.67	84	Det.-126
Fluoranthene	4.00	< 0.21	3.57	89	Det.-142
Pyrene	2.00	< 0.27	1.28	64	Det.-140
Benzo[*a*]anthracene	2.00	< 0.013	1.47	74	12-135
Chrysene	1.86	< 0.15	1.33	72	Det.-199
Benzo[*b*]fluoranthene	4.00	< 0.018	2.92	73	6-150
Benzo[*k*]fluoranthene	2.00	< 0.017	1.53	77	Det.-159
Benzo[*a*]pyrene	2.00	< 0.023	1.38	69	Det.-128
Dibenzo[*a,h*]anthracene	4.00	< 0.030	1.92	48	Det.-110
Benzo[*g,h,i*]perylene	2.00	< 0.076	1.62	41	Det.-116
Indeno[1,2,3-*cd*]pyrene	2.00	< 0.043	1.23	62	Det.-116

* Values outside of QC limits.
D Diluted out. Percent Recovery and RPD are not calculated when spike compound(s) are diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration is more than four times that of the spike added.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-03-0341

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Polynuclear Aromatic Hydrocarbons
EPA Method 8310

Sample Spiked: 030341-01 Client ID: BATCH QC

Date Analyzed: 03/18/93 Standard ID:

Compound	Spike Added, ug/L	MSD Concentration, ug/L	MSD Percent Recovery, %	RPD, %	Acceptability Limits: RPD, %
Naphthalene	20.0	17.9	90	5	60
Acenaphthylene	40.0	38.2	96	5	60
Acenaphthene	20.0	19.4	97	5	60
Fluorene	4.00	3.81	95	4	60
Phenanthrene	2.00	1.57	79	1	60
Anthracene	2.00	1.69	85	1	60
Fluoranthene	4.00	3.48	87	3	60
Pyrene	2.00	1.29	65	1	60
Benzo[*a*]anthracene	2.00	1.39	70	6	60
Chrysene	1.86	1.26	68	5	60
Benzo[*b*]Fluoranthene	4.00	2.60	65	12	60
Benzo[*k*]fluoranthene	2.00	1.36	68	12	60
Benzo[*a*]pyrene	2.00	1.22	61	12	60
Dibenzo[*a,h*]anthracene	4.00	1.59	40	19	60
Benzo[*g,h,i*]perylene	4.00	1.33	33	20	60
Indeno[1,2,3-*cd*]pyrene	2.00	1.00	50	21	60

* Values outside of QC limits.
D Diluted out. Percent Recovery and RPD are not calculated when spike compound(s) are diluted out.
NA Not Applicable. Percent Recovery is not calculated when concentration is more than four times that of the spike added.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Client Number: 011105307
Project ID: Osmose
Login Number: M3-03-0341

METHOD BLANK RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

	GTEL Blank ID	BW0316-1
	GTEL File ID	BW0316-1
	Date Extracted	03/16/93
	Date Analyzed	03/18/93
Analyte	Detection Limit, ug/L	Concentration, ug/L
Naphthalene	1.8	< 1.8
Acenaphthylene	2.3	< 2.3
1-Methylnaphthalene	1.8	< 1.8
2-Methylnaphthalene	1.8	< 1.8
Acenaphthene	1.8	< 1.8
Fluorene	0.21	< 0.21
Phenanthrene	0.64	< 0.64
Anthracene	0.66	< 0.66
Fluoranthene	0.21	< 0.21
Pyrene	0.27	< 0.27
Benzo[*a*]anthracene	0.013	< 0.013
Chrysene	0.15	< 0.15
Benzo[*b*]fluoranthene	0.018	< 0.018
Benzo[*k*]fluoranthene	0.017	< 0.017
Benzo[*a*]pyrene	0.023	< 0.023
Dibenzo[*a,h*]anthracene	0.030	< 0.030
Benzo[*g,h,i*]perylene	0.076	< 0.076
Indeno[1,2,3-*cd*]pyrene	0.043	< 0.043

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; extraction by EPA Method 3510 (liquid-liquid).
b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.

GTEL ENVIRONMENTAL LABORATORIES, INC.

GTEL ENVIRONMENTAL LABORATORIES, INC.

MEADOWBROOK INDUSTRIAL PARK
MILFORD, NH 03055
(603) 672-4835
(800) LAB-GTEL

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

51845

Company Name: Ground Water Tech
Phone #: (716) 634-1291
FAX #:
Company Address: 80 Holtz Dr. Cheektowaga, NY.
Site location: Buffalo, N.Y.
Project Manager: Bruce Ahrens
Client Project ID: (#) 01110-5307
(NAME) Osmose
I attest that the proper field sampling procedures were used during the collection of these samples.
Sampler Name (Print): Vince Barry

Field Sample ID	GTEL Lab # (Lab use only)	# Containers	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	OTHER	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (SPECIFY)	Sampling: DATE	TIME
MW-22	1	5	X						3			5			3/10/93	1:30
MW-23	2	5	X						3			5			3/10/93	1:50
MW-26	3	5	X						3			5			3/10/93	2:05
MW-24	4	5	X						3			5			3/10/93	2:15

BTEX/602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM 503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☒	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☒	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organic Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐
									3						2	2			
									3						2	2			
									3						2	2			
									3						2	2			

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other Normal
Business Days ☐

Special Handling
GTEL Contact
Quote/Contract #
Confirmation #
PO #

SPECIAL DETECTION LIMITS
MW-24 to detect a small sheen

REMARKS

SPECIAL REPORTING REQUIREMENTS
FAX ☐

Lab Use Only Lot # 12-2 TB
Storage Location: WHB
Work Order #

QA / QC LEVEL
BLUE ☑ CLP ☐
OTHER

CUSTODY RECORD

		Date	Time	
Relinquished by Sampler:	Vince Barry	3/10/93	5:00pm	Received by:
Relinquished by:	Vince Barry	3/11/93	4:00pm	Received by:
Relinquished by:		3.12.93	11:35	Received by Laboratory:

Waybill # 154021375 5/154021379 C

Rev. 7/91

GTEL
ENVIRONMENTAL
LABORATORIES, INC.

Northeast Region
Meadowbrook Industrial Park
Milford, NH 03055
(603) 672-4835
(603) 673-8105 (FAX)

Client Number: 011105307
Project ID: Osmose
Login Number: M3-01-0074

RECEIVED
JAN 22 1993

January 19, 1993

Bruce Ahrens
Groundwater Technology, Inc.
1245 Kings Road
Schenectady, NY 12303

Dear Mr. Ahrens:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 01/06/93 under chain-of-custody record S2164.

A formal Quality Assurance / Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified (approved) by the State of New York under number 10599.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Lynn Sullivan for Sue

Susan C. Uhler
Laboratory Director

Client Number: 011105307
Project ID: Osmose
Login Number: M3-01-0074

ANALYTICAL RESULTS

Polynuclear Aromatic Hydrocarbons in Water
EPA Method 8310[a]

GTEL Sample Number		010074-01	010074-02	--	--
Client Identification		SP-#1	SP-#2	--	--
Date Sampled		01/05/93	01/05/93	--	--
Date Extracted		01/07/93	01/07/93	--	--
Date Analyzed		01/08/93	01/08/93[c]	--	--
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Naphthalene	1.8	< 1.8	**370**[c]	--	--
Acenaphthylene	2.3	**13**	**7.8**	--	--
1-Methylnaphthalene	1.8	< 1.8	**50**	--	--
2-Methylnaphthalene	1.8	< 1.8	**330**[c]	--	--
Acenaphthene	1.8	< 1.8	**120**[c]	--	--
Fluorene	0.21	**2.5**	**93**[c]	--	--
Phenanthrene	0.64	**2.1**	**230**[c]	--	--
Anthracene	0.66	< 0.66	**55 X**[c]	--	--
Fluoranthene	0.21	**1.1**	**86 X**[c]	--	--
Pyrene	0.27	**0.45**	**64 X**[c]	--	--
Benzo[*a*]anthracene	0.013	**0.11**	**12 X**[c]	--	--
Chrysene	0.15	**0.32**	**17 X**[c]	--	--
Benzo[*b*]fluoranthene	0.018	**0.19**	**4.6 X**	--	--
Benzo[*k*]fluoranthene	0.017	**0.086**	**2.2 X**	--	--
Benzo[*a*]pyrene	0.023	**0.11**	**4.4 X**	--	--
Dibenzo[*a,h*]anthracene	0.030	< 0.030	**0.47**	--	--
Benzo[*g,h,i*]perylene	0.076	**0.098**	**1.5**	--	--
Indeno[1,2,3-*cd*]pyrene	0.043	**0.085**	**1.8**	--	--
Detection Limit Multiplier[b]		1.00	1.00[c]	--	--

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986; Extraction by EPA Method 3510 (liquid-liquid).
b The detection limit multiplier indicates the adjustments made to the data and detection limits for sample dilutions.
c Detection Limit Multiplier for analyte noted = 40.0; Date Analyzed = 01/18/93.
X Estimated concentration. Matrix Spike recovery for this analyte demonstrated matrix effect.

GTEL ENVIRONMENTAL LABORATORIES, INC.

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Meadowbrook Industrial Park
Milford, New Hampshire 03055
(603) 672-4835 / FAX: (603) 673-8105

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

NO. S 2164

Company Name: GTI - Albany
Address: 1245 Kings Rd, Schenectady N.Y. 12303
Phone #: (518) -370- 5631
Project Manager: Bruce Ahrens
Project ID: Osmose
Project Number: 01110-5307
Site Location: (City, State) Buffalo, N.Y.
~~DUNS #:~~
~~Bill to Fax Eng.:~~
Release/Work Order #:

I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler Name (Print): Mark Colmerauer

Field Sample ID	DEPTH TO GROUNDWATER	GTEL Lab # (Lab use only)	# CONTAINERS	Matrix: WATER	SOIL	AIR	SLUDGE	PRODUCT	Method Preserved: HCl	HNO_3	H_2SO_4	ICE	UNPRESERVED	OTHER (Specify)	Sampling: DATE	TIME
SP-#1		1	2	X								X			1-5-93	10:30
SP-#2		2	2	X								X			1-5-93	10:45
SP-#3		3	2	X								X			1-5-93	11:15

ANALYSIS REQUEST

BTEX 602 ☐ 8020 ☐ with MTBE ☐	BTEX/Gas Hydrocarbons PID/FID ☐ with MTBE ☐	Hydrocarbons GC/FID Gas ☐ Diesel ☐ Screen ☐	Hydrocarbon Profile (SIMDIS) ☐	Oil and Grease 413.1 ☐ 413.2 ☐ SM-503 ☐	TPH/IR 418.1 ☐ SM 503 ☐	EDB by 504 ☐ DBCP by 504 ☐	EPA 503.1 ☐ EPA 502.2 ☐	EPA 601 ☐ EPA 8010 ☐	EPA 602 ☐ EPA 8020 ☐	EPA 608 ☐ 8080 ☐ PCB only ☐	EPA 624/PPL ☐ 8240/TAL ☐ NBS (+15) ☐	EPA 625/PPL ☐ 8270/TAL ☐ NBS (+25) ☐	EPA 610 ☐ 8310 ☐	EP TOX Metals ☐ Pesticides ☐ Herbicides ☐	TCLP Metals ☐ VOA ☐ Semi-VOA ☐ Pest ☐ Herb ☐	EPA Metals - Priority Pollutant ☐ TAL ☐ RCRA ☐	CAM Metals TTLC ☐ STLC ☐	Lead 239.2 ☐ 200.7 ☐ 7420 ☐ 7421 ☐ 6010 ☐	Organo Lead ☐	Corrosivity ☐ Flash Point ☐ Reactivity ☐	OTHER
												X	X							
													X							
													X							

TAT
Priority (24 hr) ☐
Expedited (48 hr) ☐
7 Business Days ☐
Other _____ Business Days ☐

Special Handling
GTEL Contact _____
Quote/Contract # 800-79-089
Confirmation # _____
P.O. # _____

QA/QC Level
Blue ☐ CLP ☐ Other ☐ _____

SPECIAL DETECTION LIMITS (Specify)

SPECIAL REPORTING REQUIREMENTS (Specify)
SUN REPORT FORMAT (602/BTEX)
FAX ☐

REMARKS:
Sampled by GTI - Cheektowaga [(716) -634-1291] for GTI - Albany

Lab Use Only Lot #: Storage Location W-7D
Work Order #:

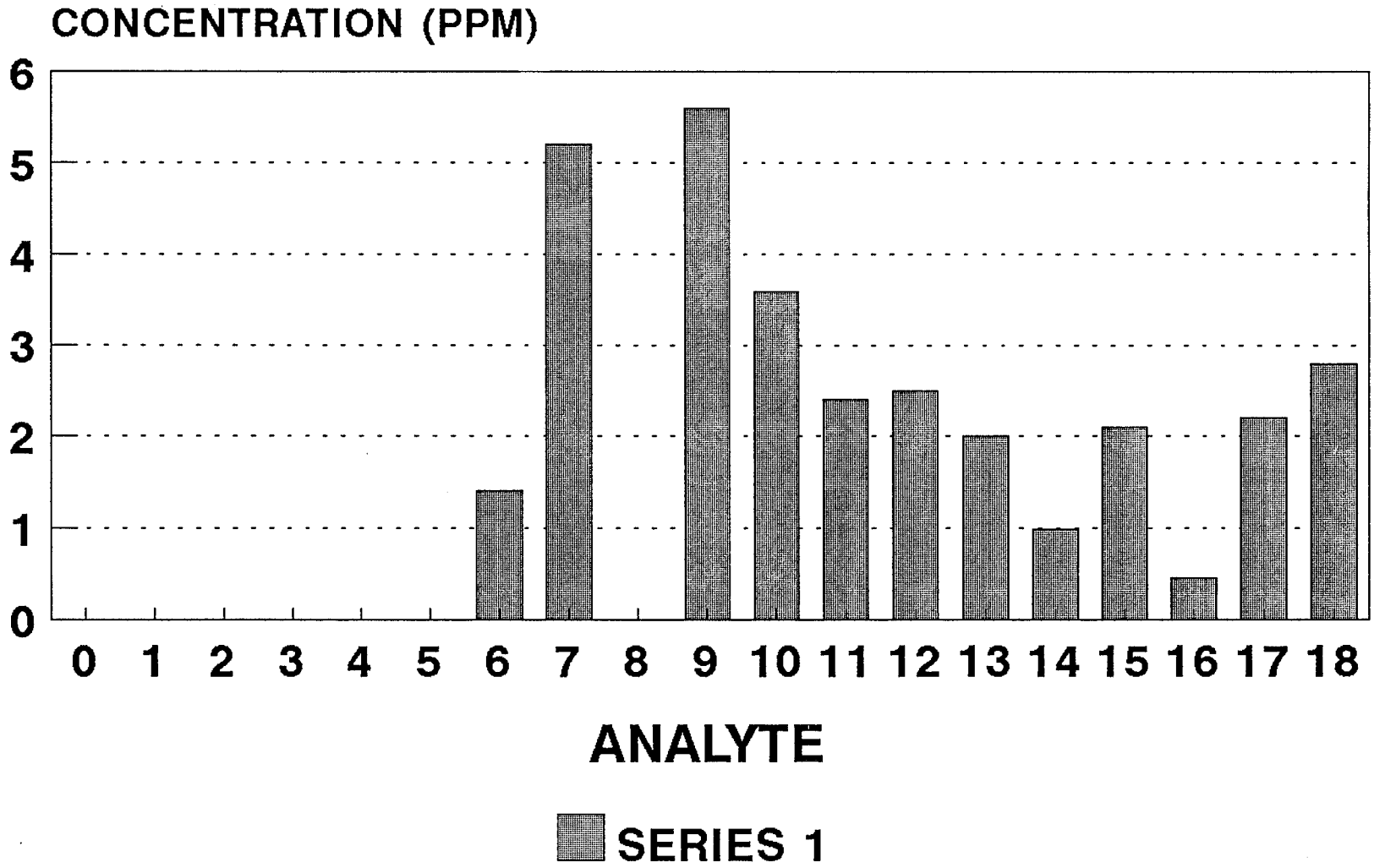
CUSTODY RECORD

	Date	Time	
Relinquished by Sampler: Mark Colmerauer	1-5-93	1:00 p.m.	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date 1-6-93	Time 1700	Received by Laboratory: Way bill # FEDEX 5042127174

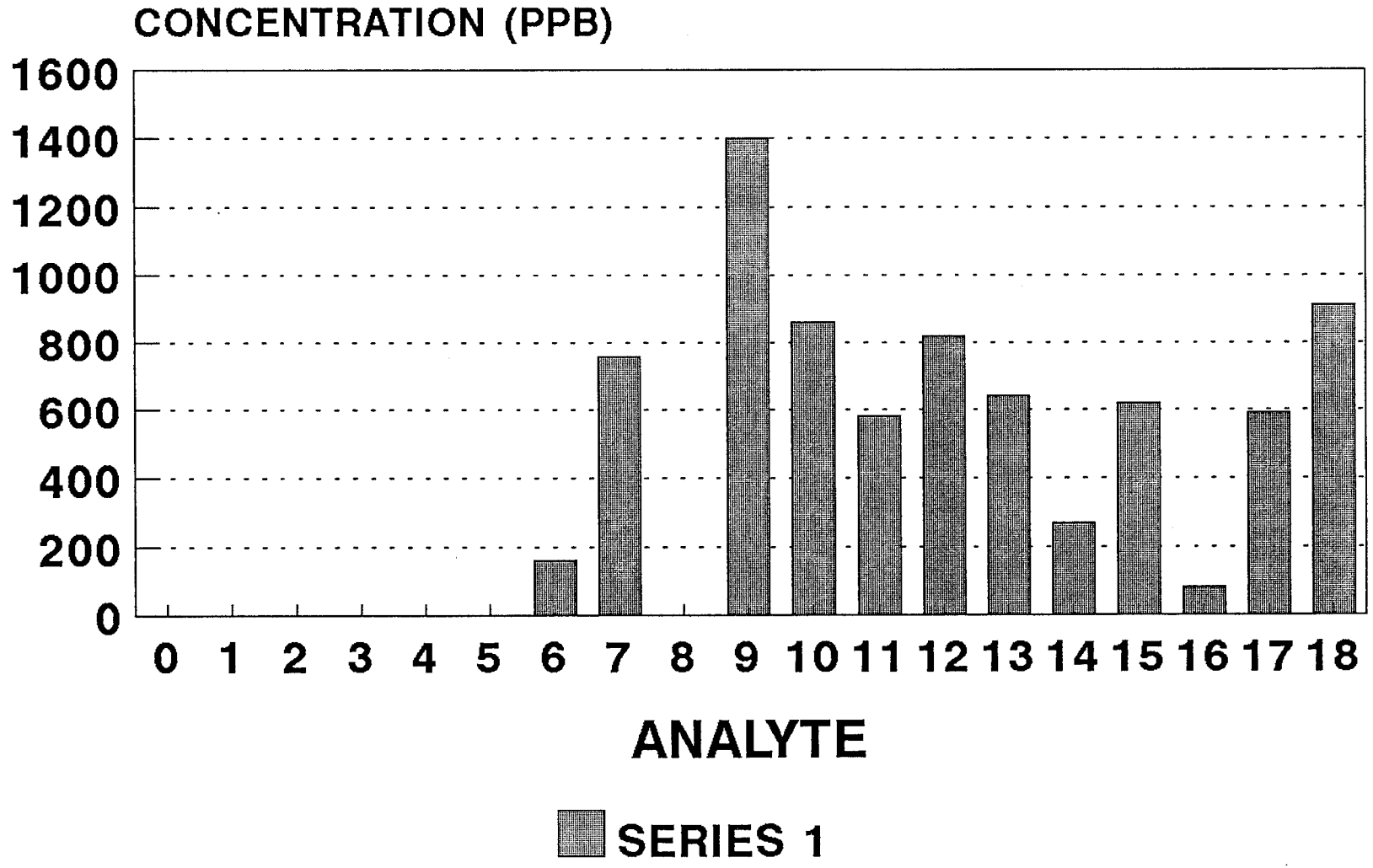
OSMOSE WOOD PRESERVING, INC.
PAHs IN BIOCELL SOILS

Analtye Number	PAH Analyte
1	Naphthalene
2	2–Methylnaphthalene
3	Acenaphthylene
4	Acenapthene
5	1–Methylnaphthalene
6	Fluorene
7	Phenanthrene
8	Anthracene
9	Fluoranthene
10	Pyrene
11	Benzo {a} anthracene
12	Chrysene
13	Benzo {b} fluoranthene
14	Benzo {k} fluoranthene
15	Benzo {a} pyrene
16	Dibenzo {a,h} anthracene
17	Benzo {g,h,i} perylene
18	Indeno { 1,2,3–cd} pyrene

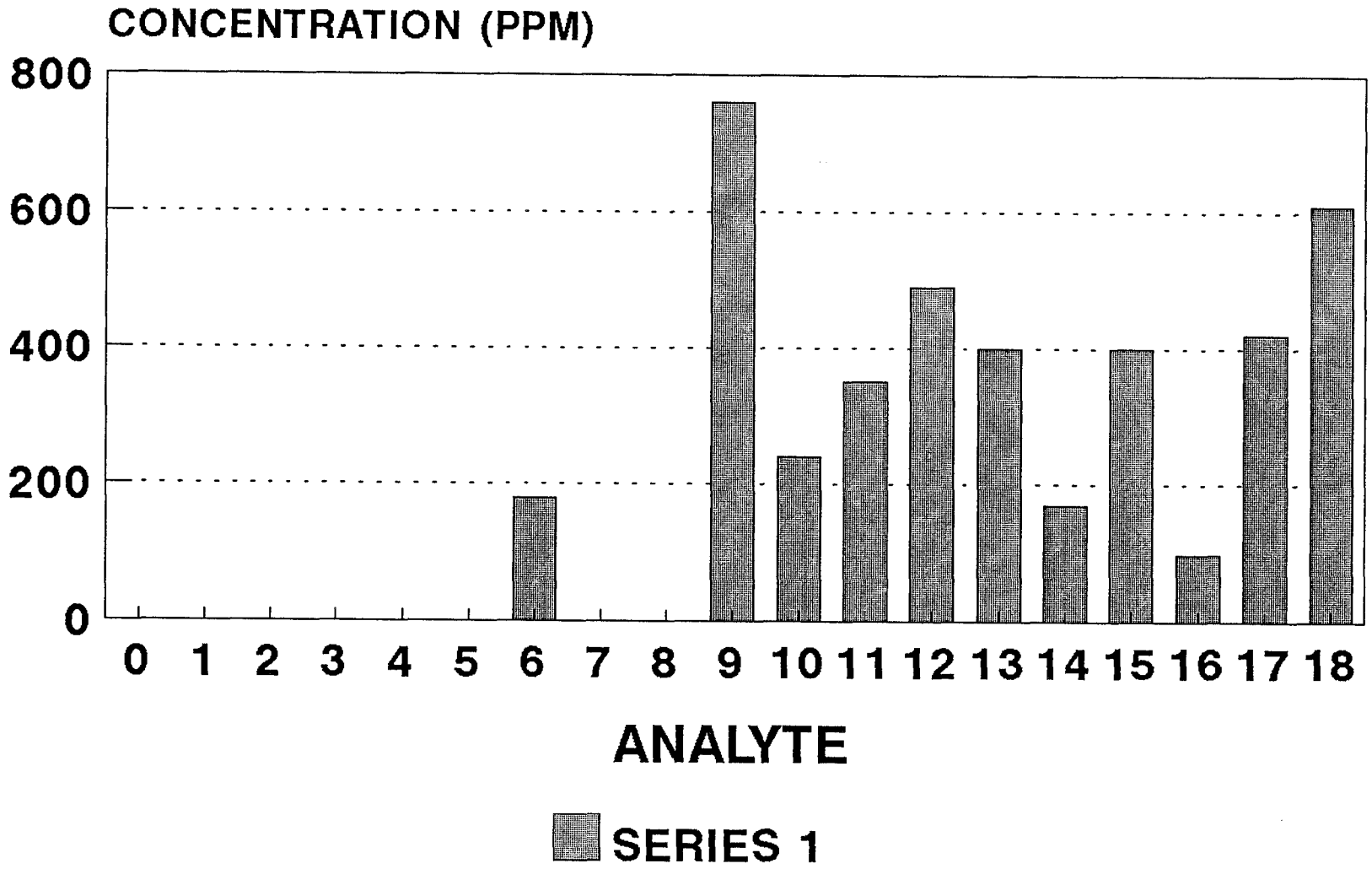
OSMOSE WOOD PRESERVING INC.
SURFACE SOIL GRAB SAMPLE SS-4
SAMPLE DATE: 6/29/93



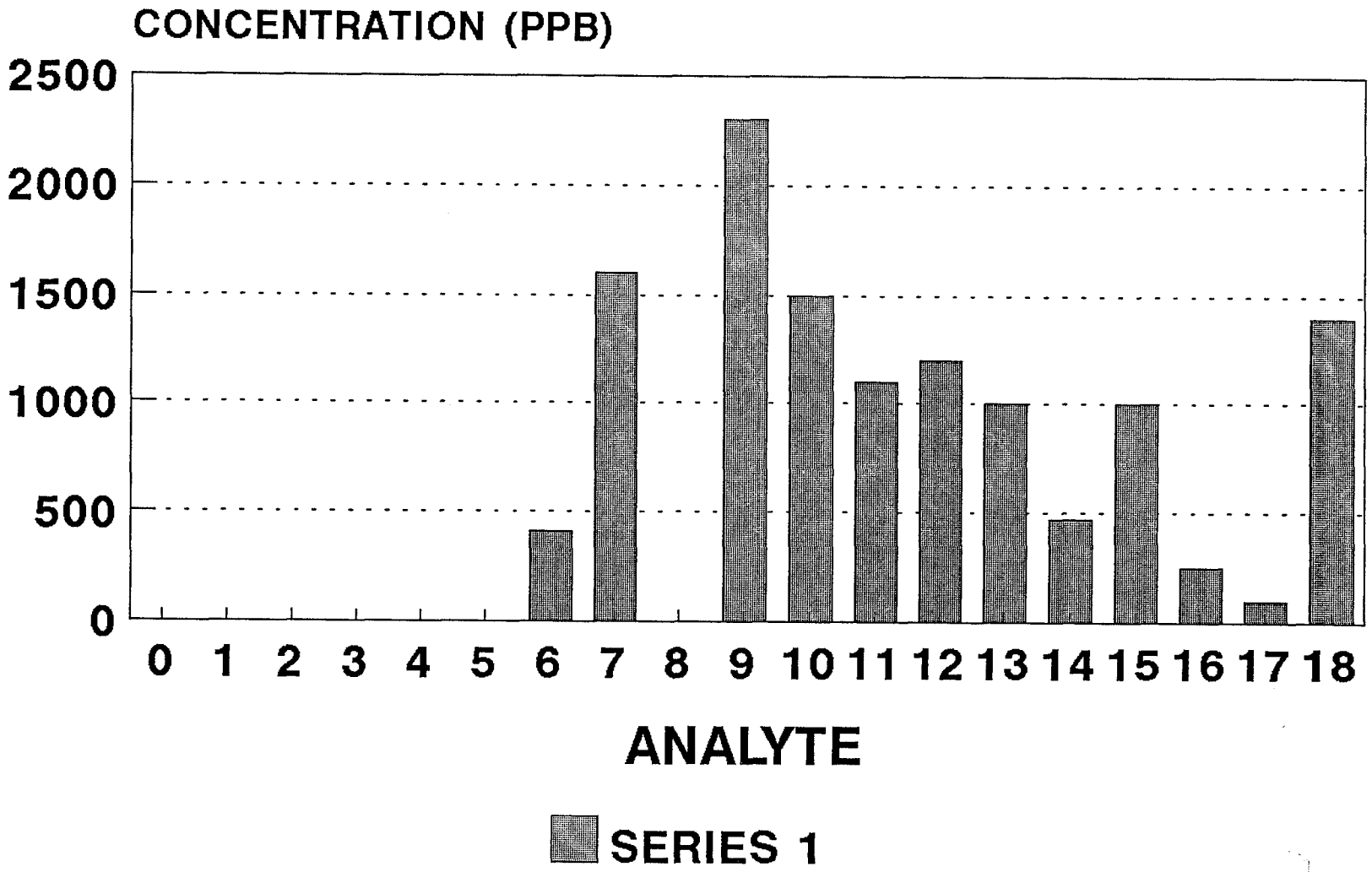
OSMOSE WOOD PRESERVING INC.
SURFACE SOIL GRAB SAMPLE SS-5
SAMPLE DATE: 6/29/93



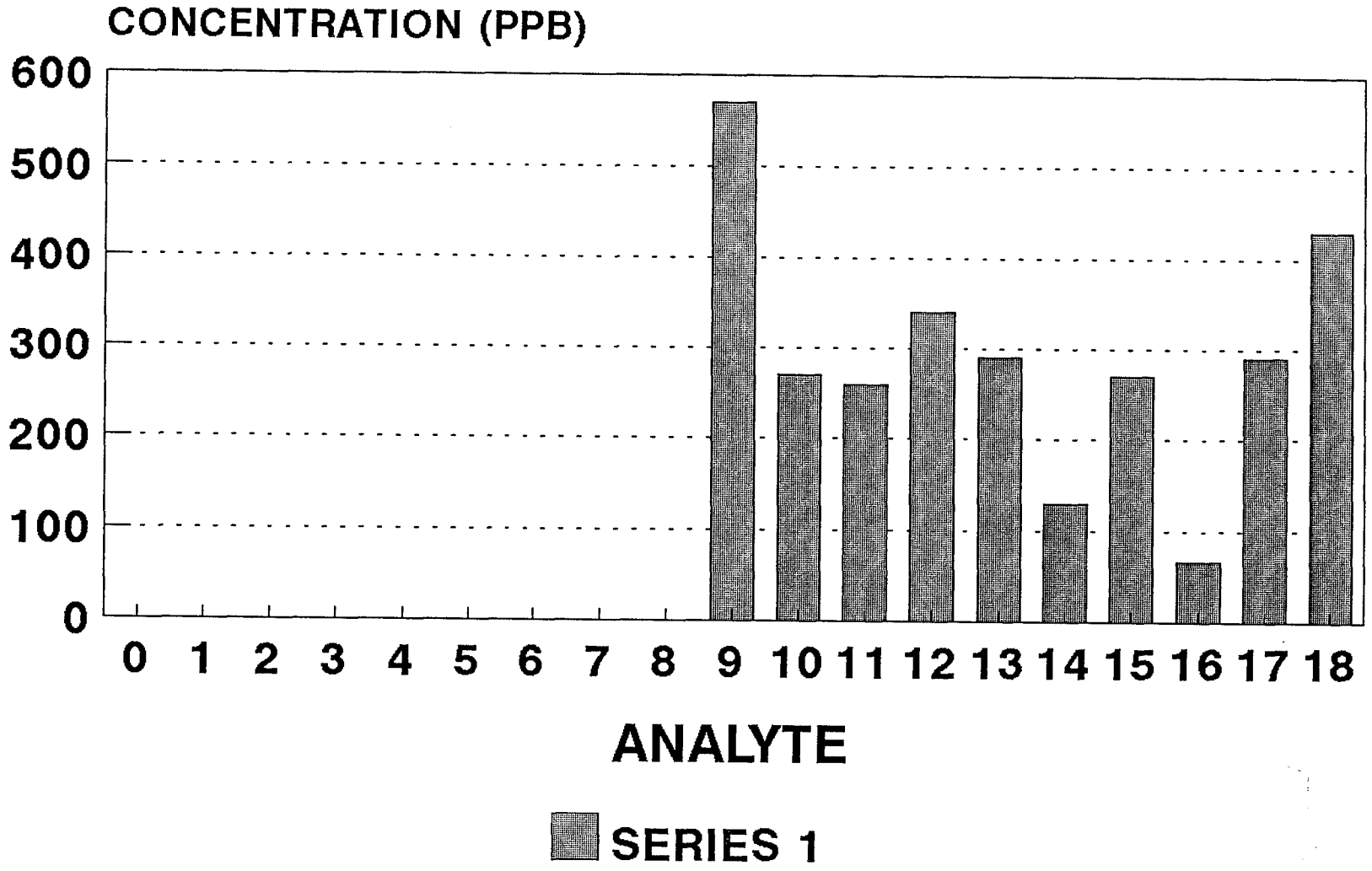
OSMOSE WOOD PRESERVING INC.
SURFACE SOIL GRAB SAMPLE SS-6
SAMPLE DATE: 6/29/93



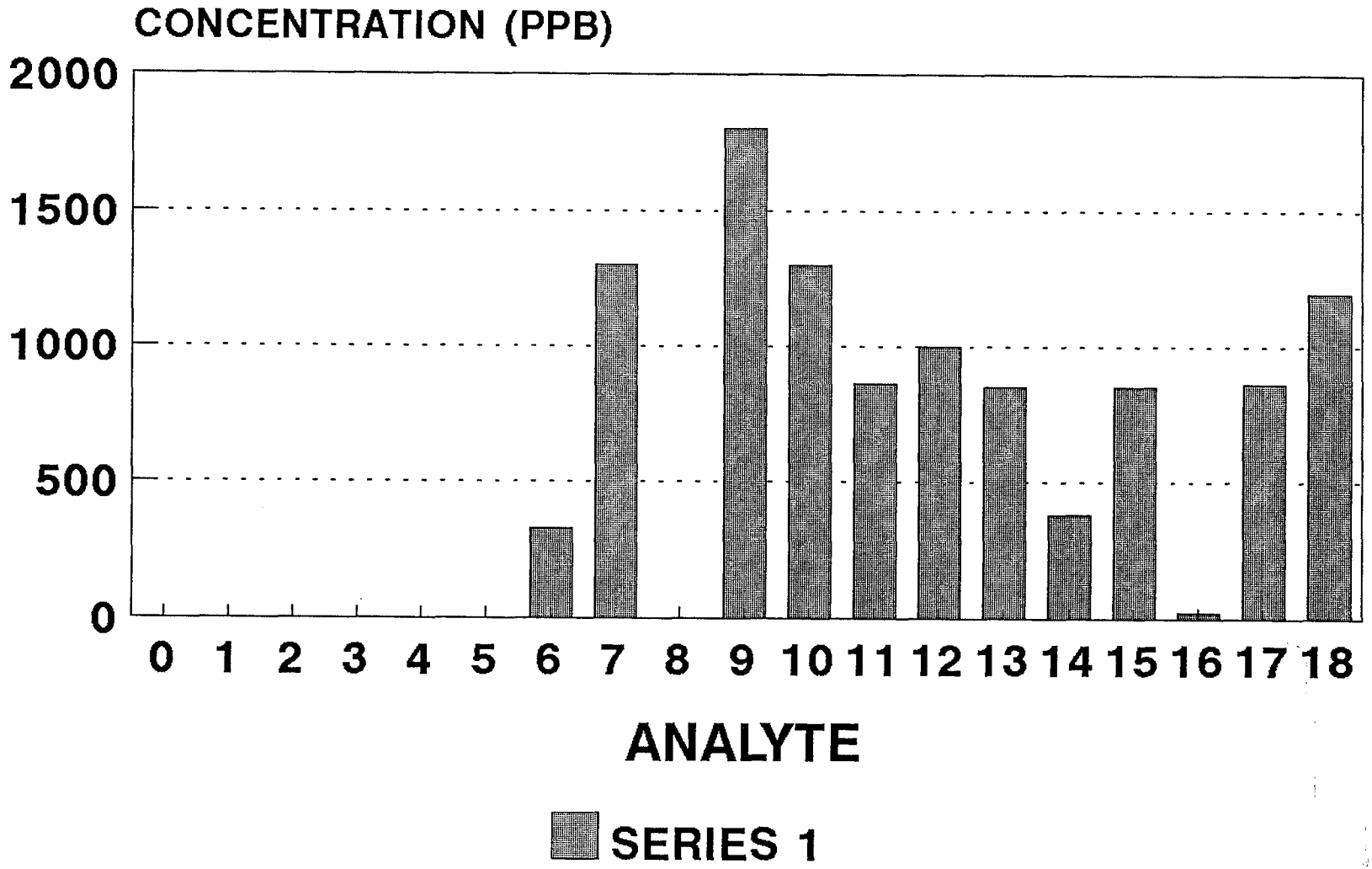
OSMOSE WOOD PRESERVING INC.
SURFACE SOIL GRAB SAMPLE SS-7
SAMPLE DATE: 6/29/93



OSMOSE WOOD PRESERVING INC.
SURFACE SOIL GRAB SAMPLE SS-8
SAMPLE DATE: 6/29/93



OSMOSE WOOD PRESERVING INC.
SURFACE SOIL GRAB SAMPLE SS-9
SAMPLE DATE: 6/29/93



OSMOSE WOOD PRESERVING, INC.
PAHs IN BIOCELL SOILS

Analtye Number	PAH Analyte
1	Naphthalene
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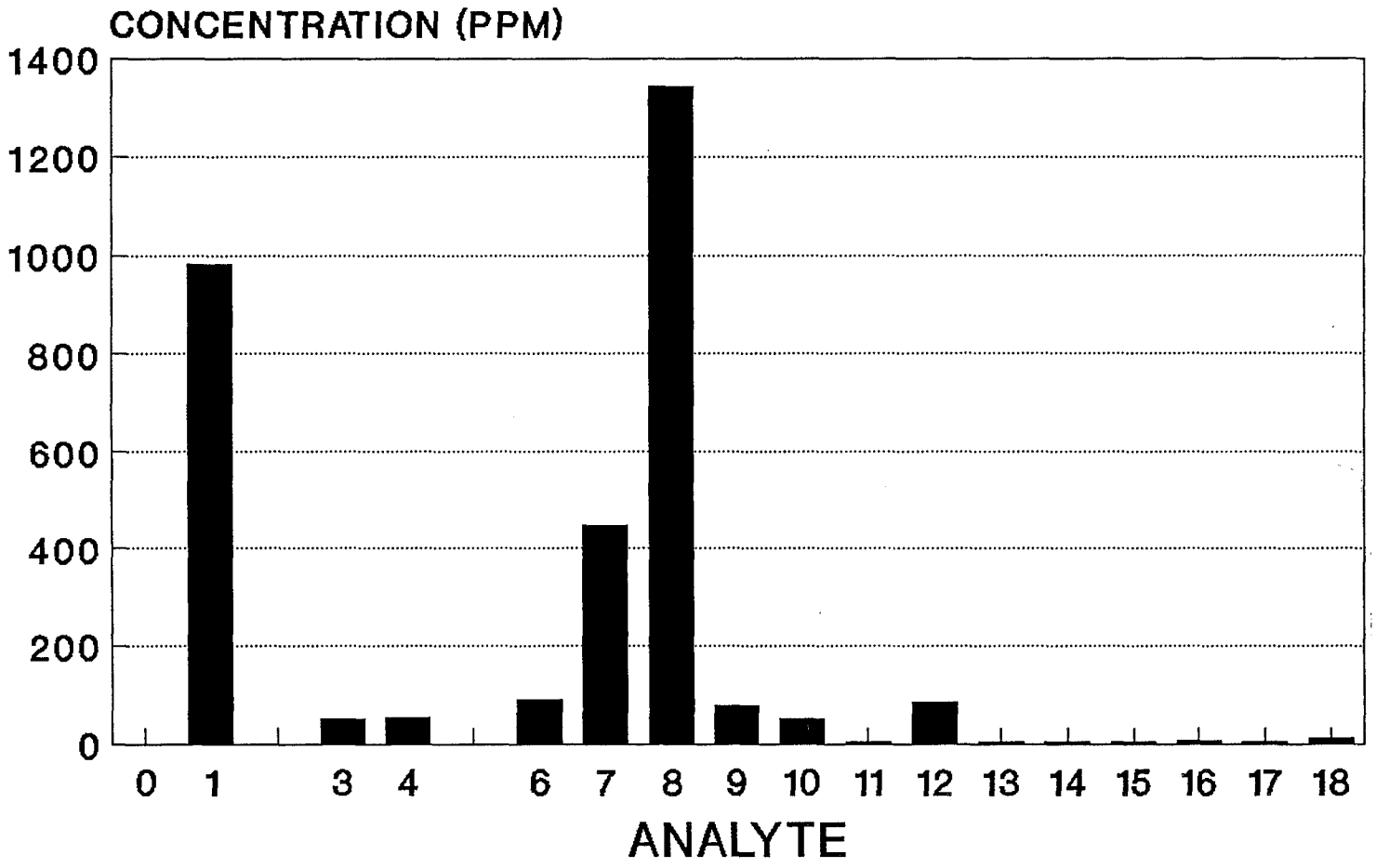
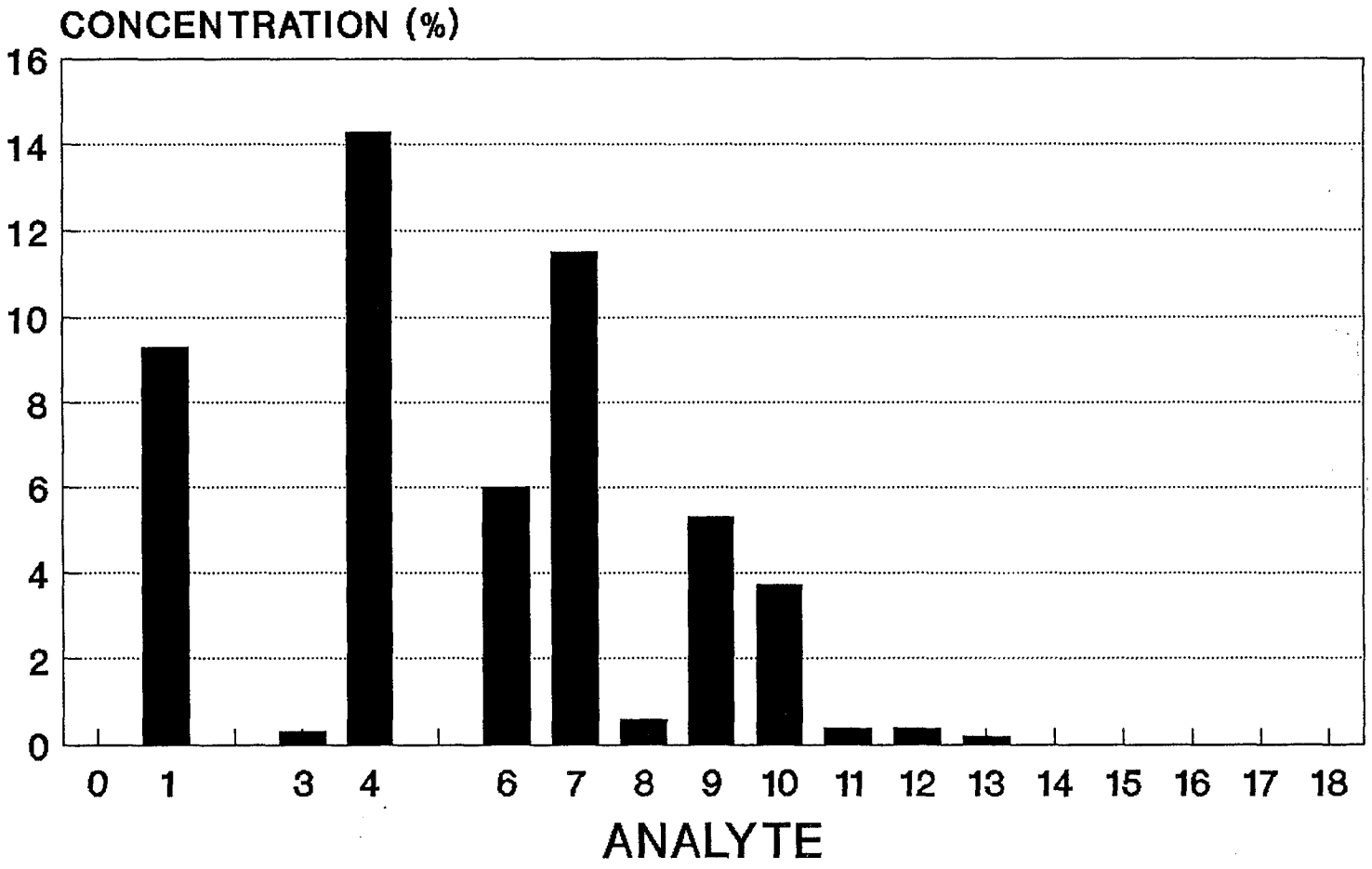
16	Dibenzo {a,h} anthracene
17	Benzo {g,h,i} perylene
18	Indeno { 1,2,3–cd} pyrene

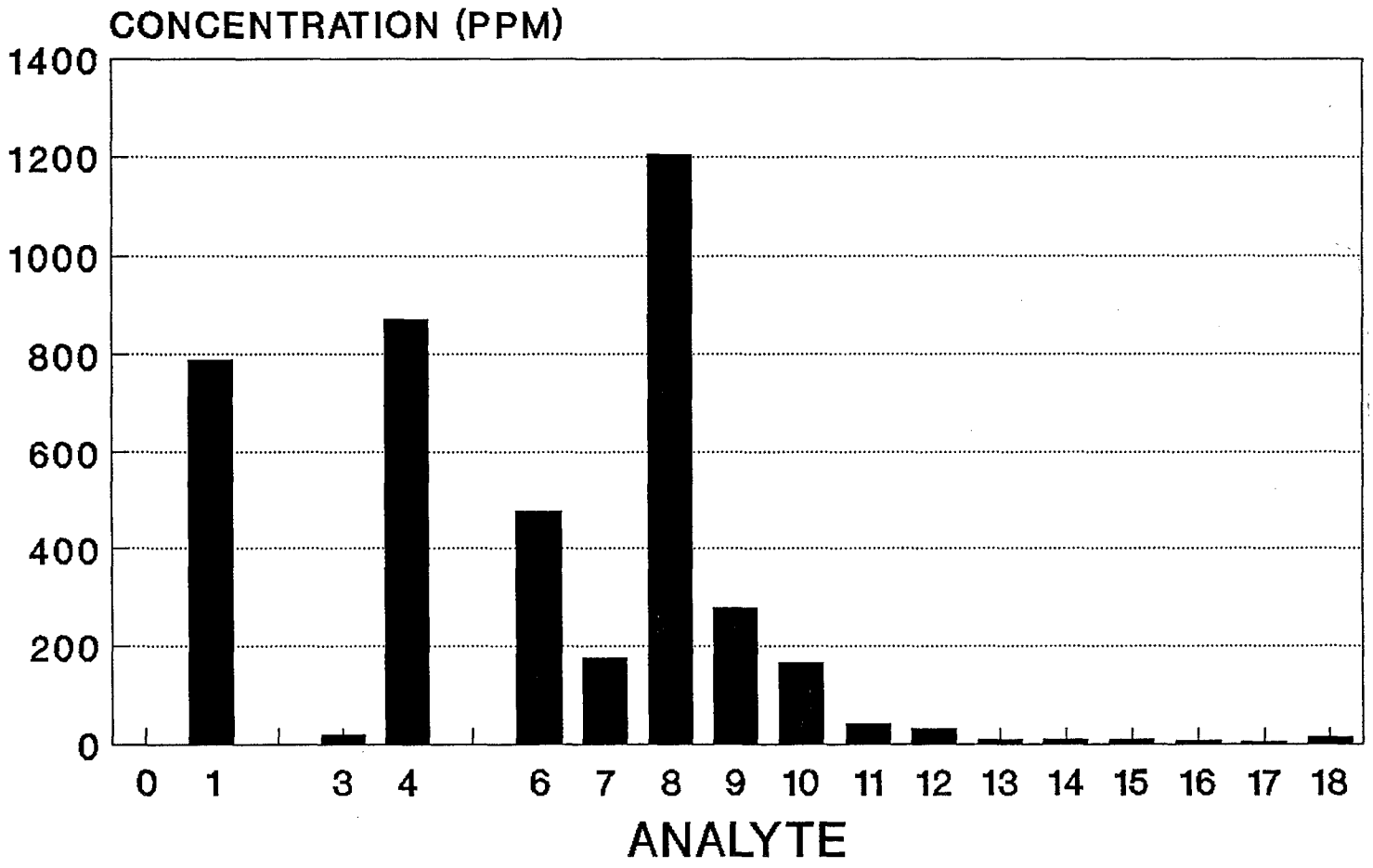
PAH Profile
#2 Fuel Oil



PAH Profile
Creosote



PAH Profile
Well Product



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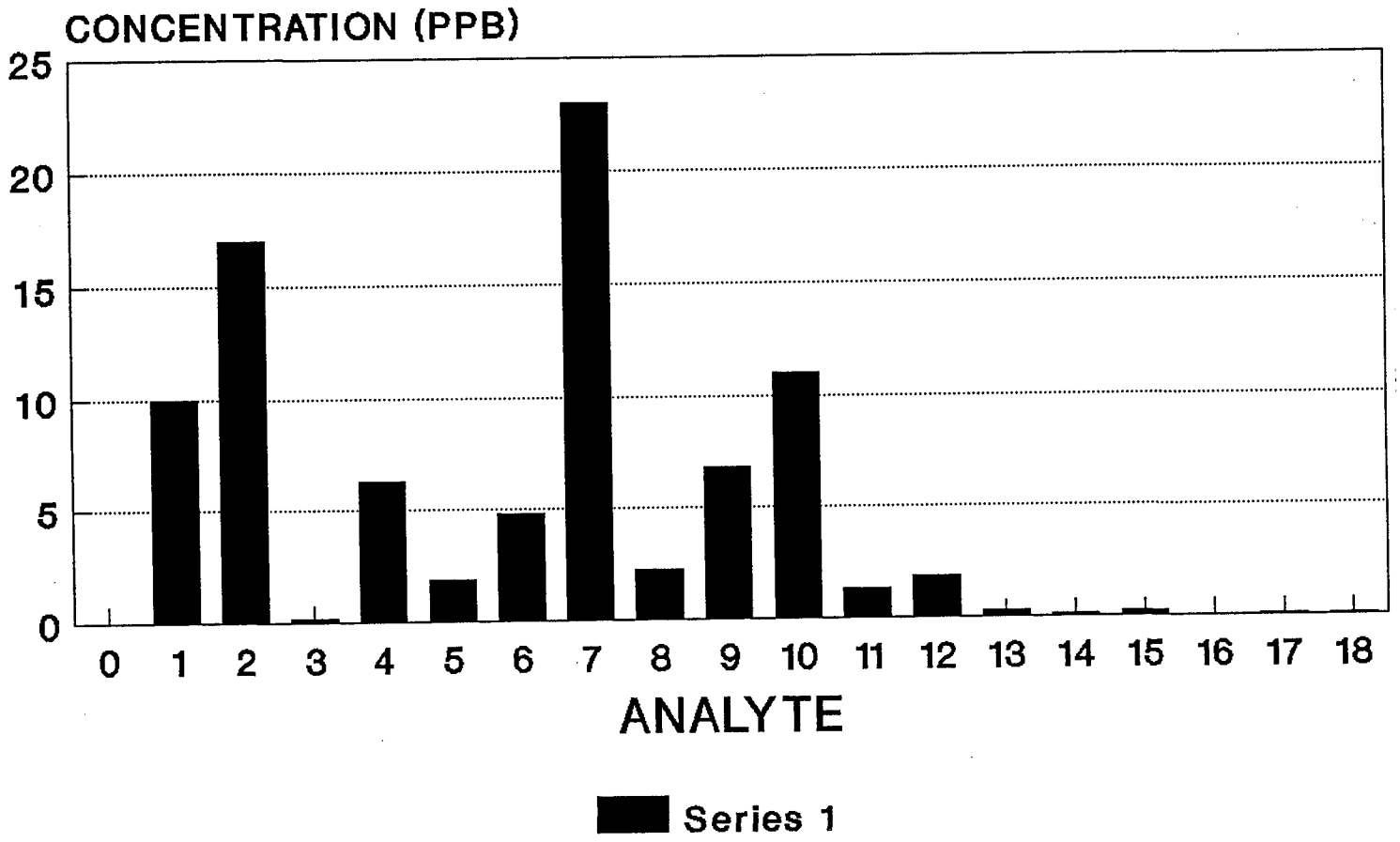
16	Dibenzo {a,h} anthracene
17	Benzo {g,h,i} perylene
18	Indeno { 1,2,3–cd} pyrene

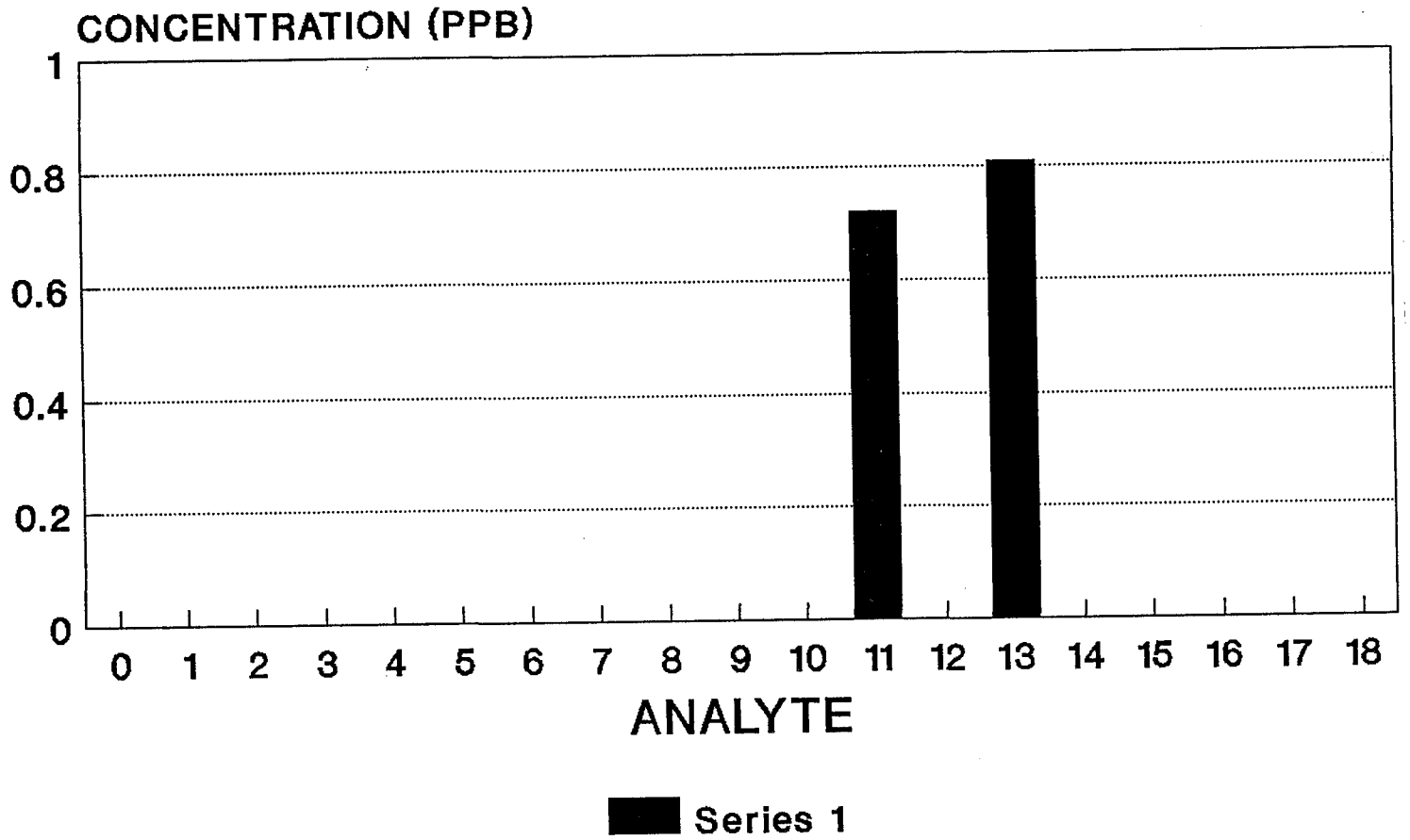
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-15 (8'-10')



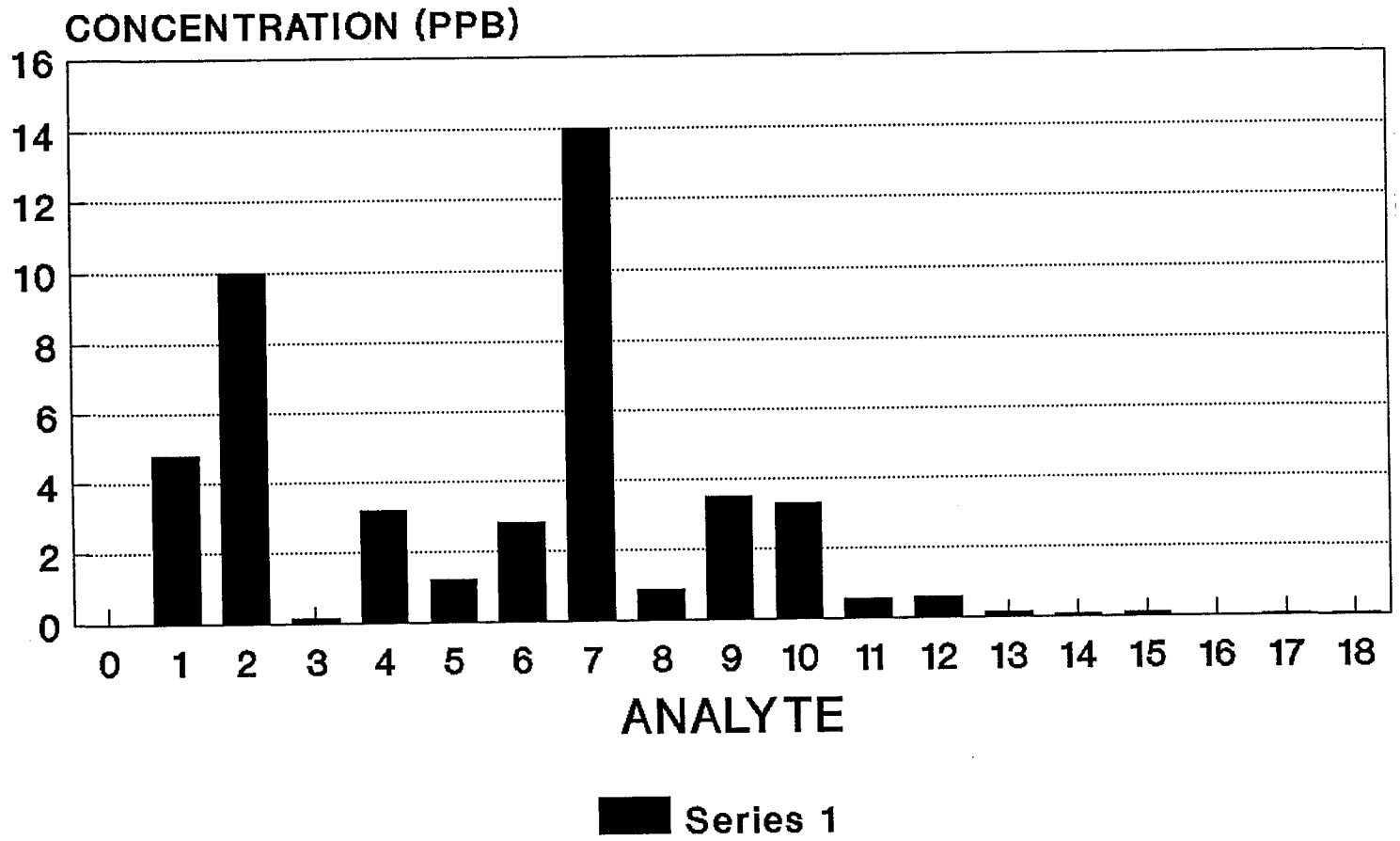
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-15 (18'-20')



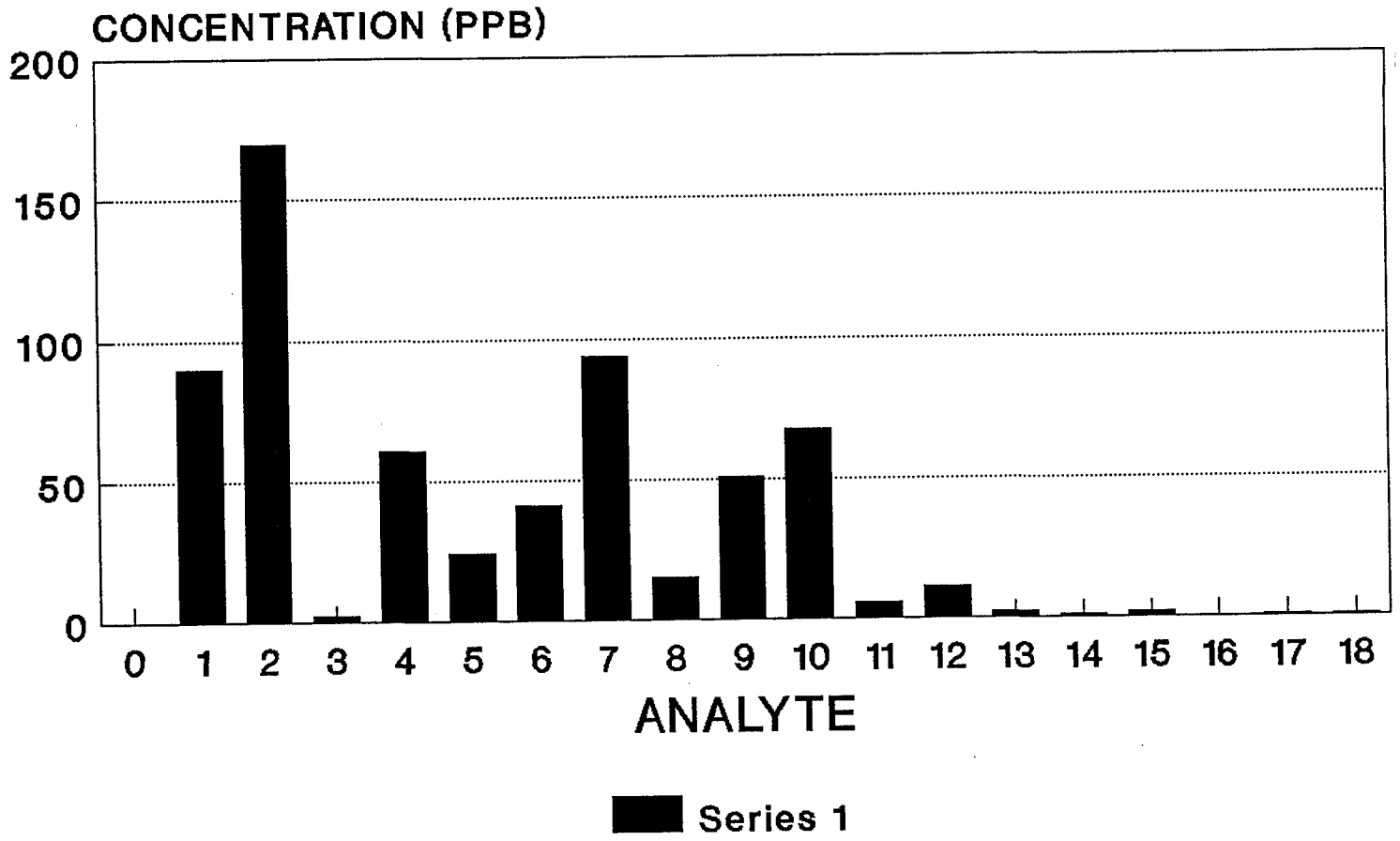
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-16 (6'-7')



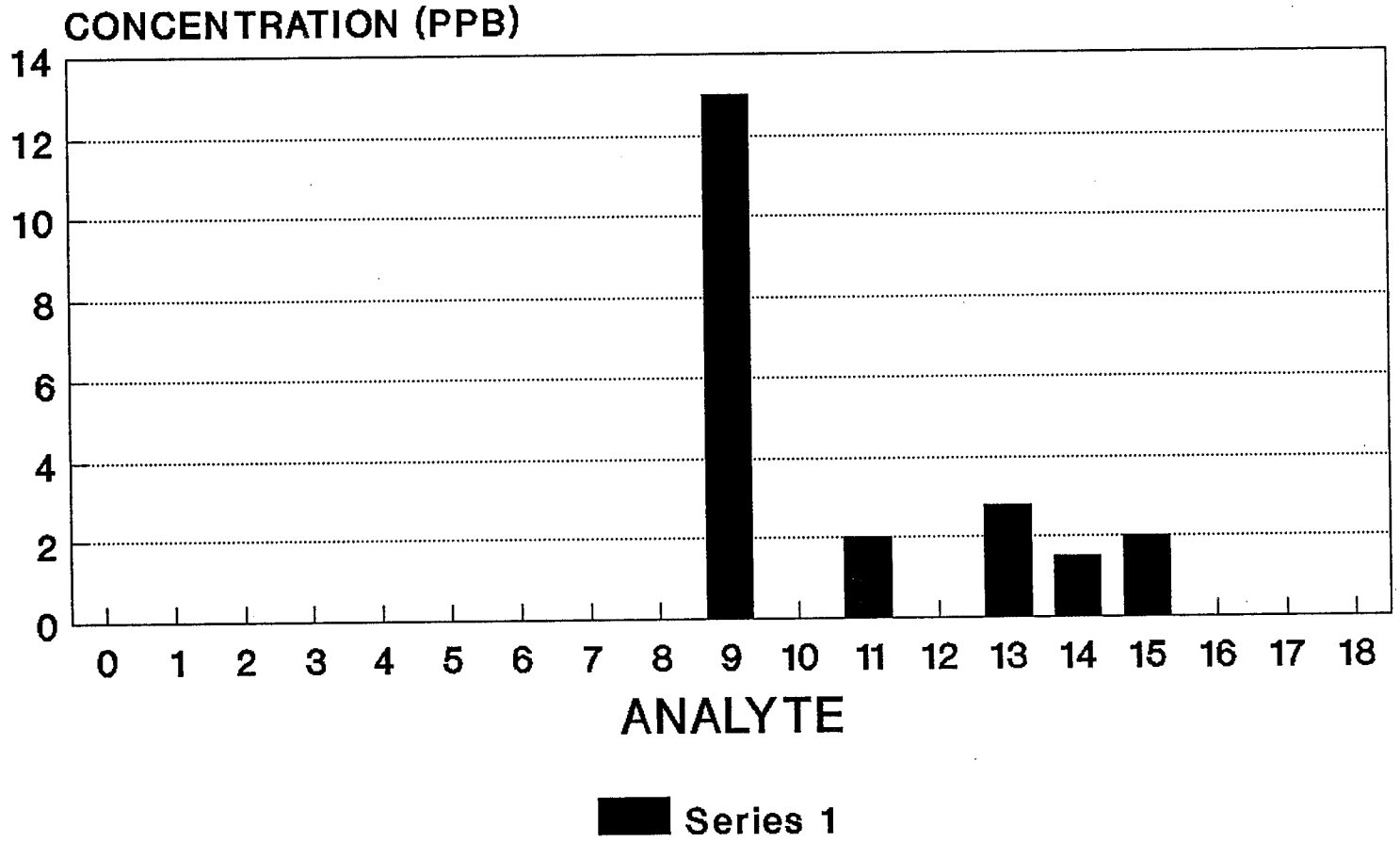
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-16 (7'-8')



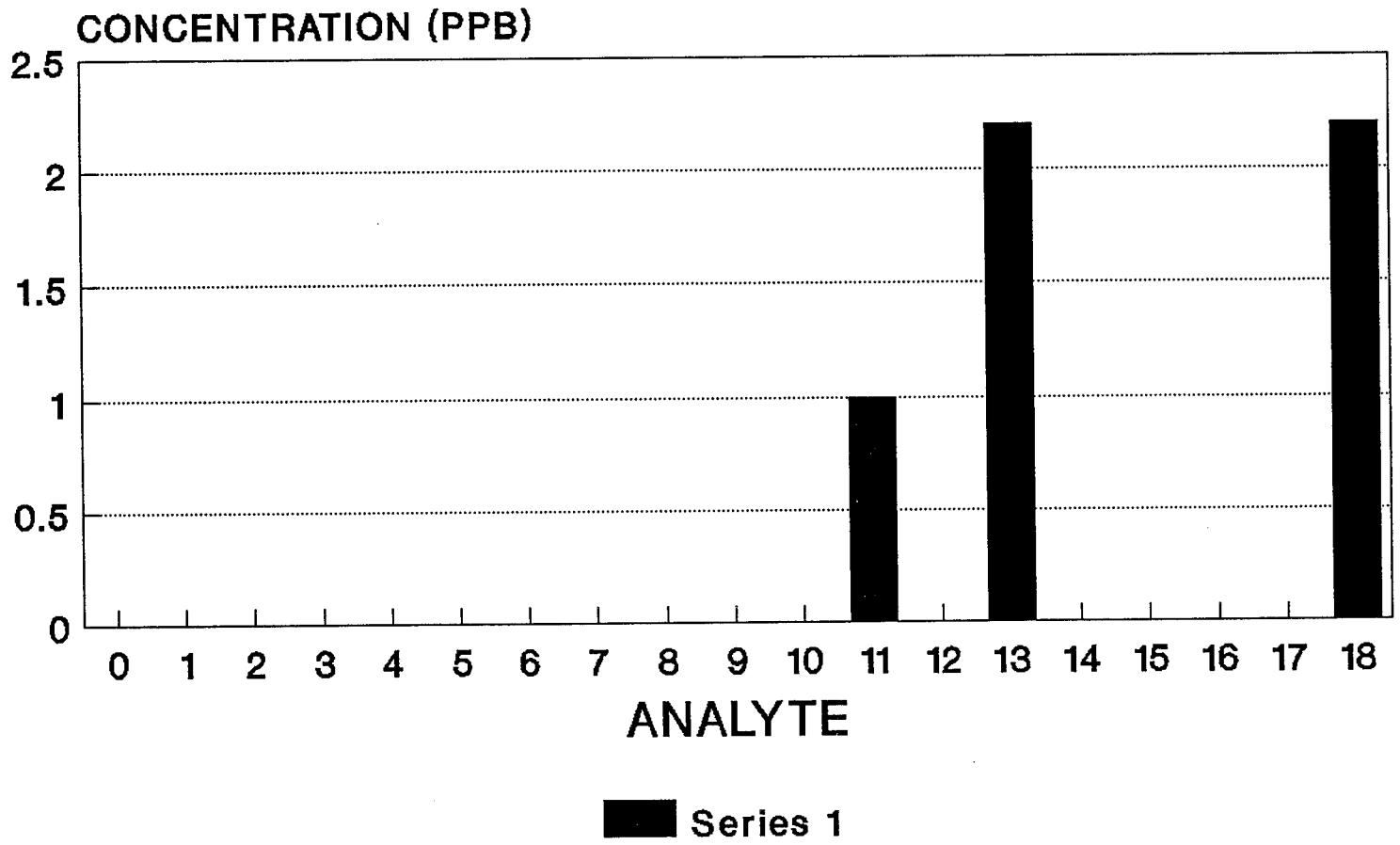
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-16 (18'-20')



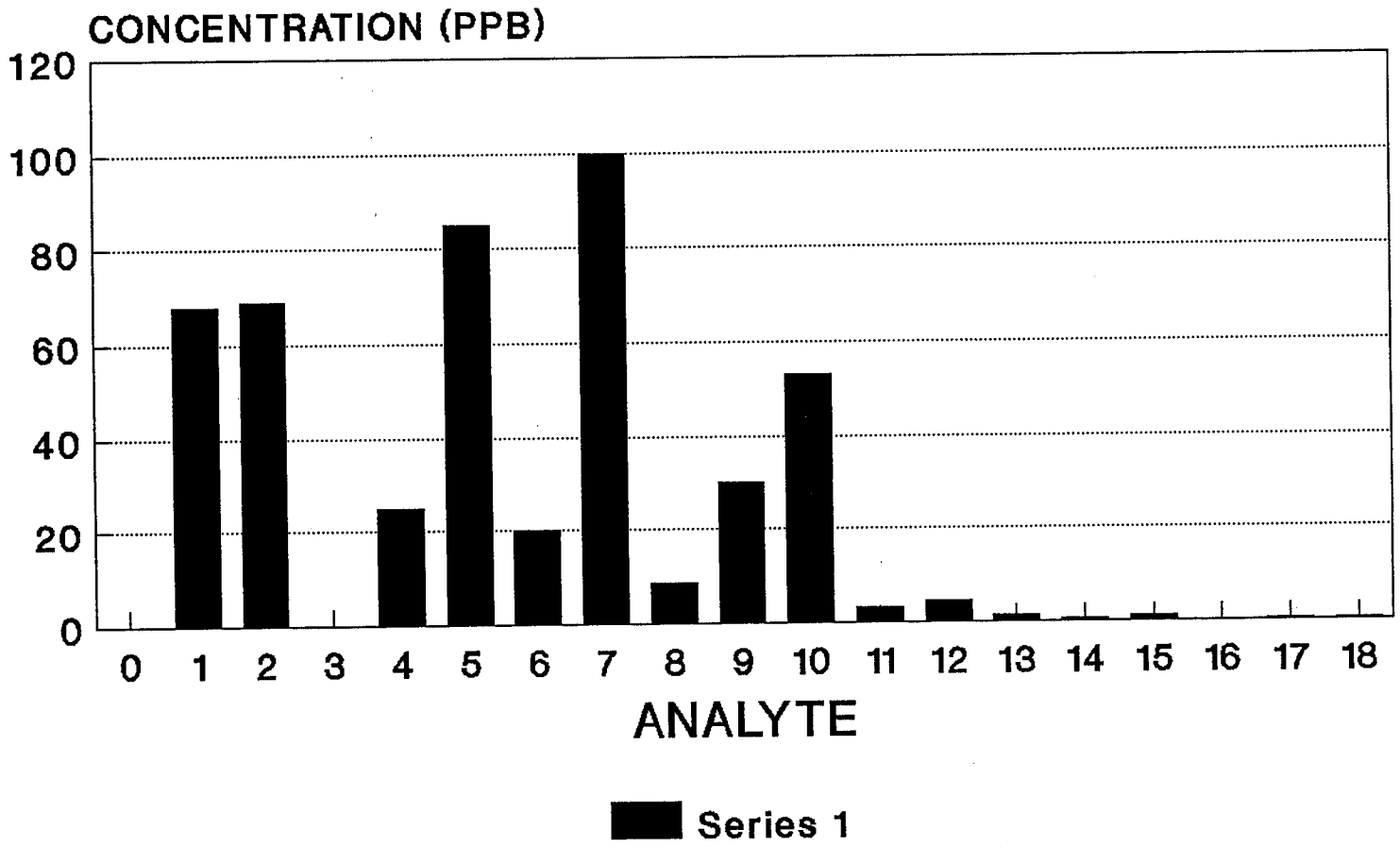
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-17 (2'-4')



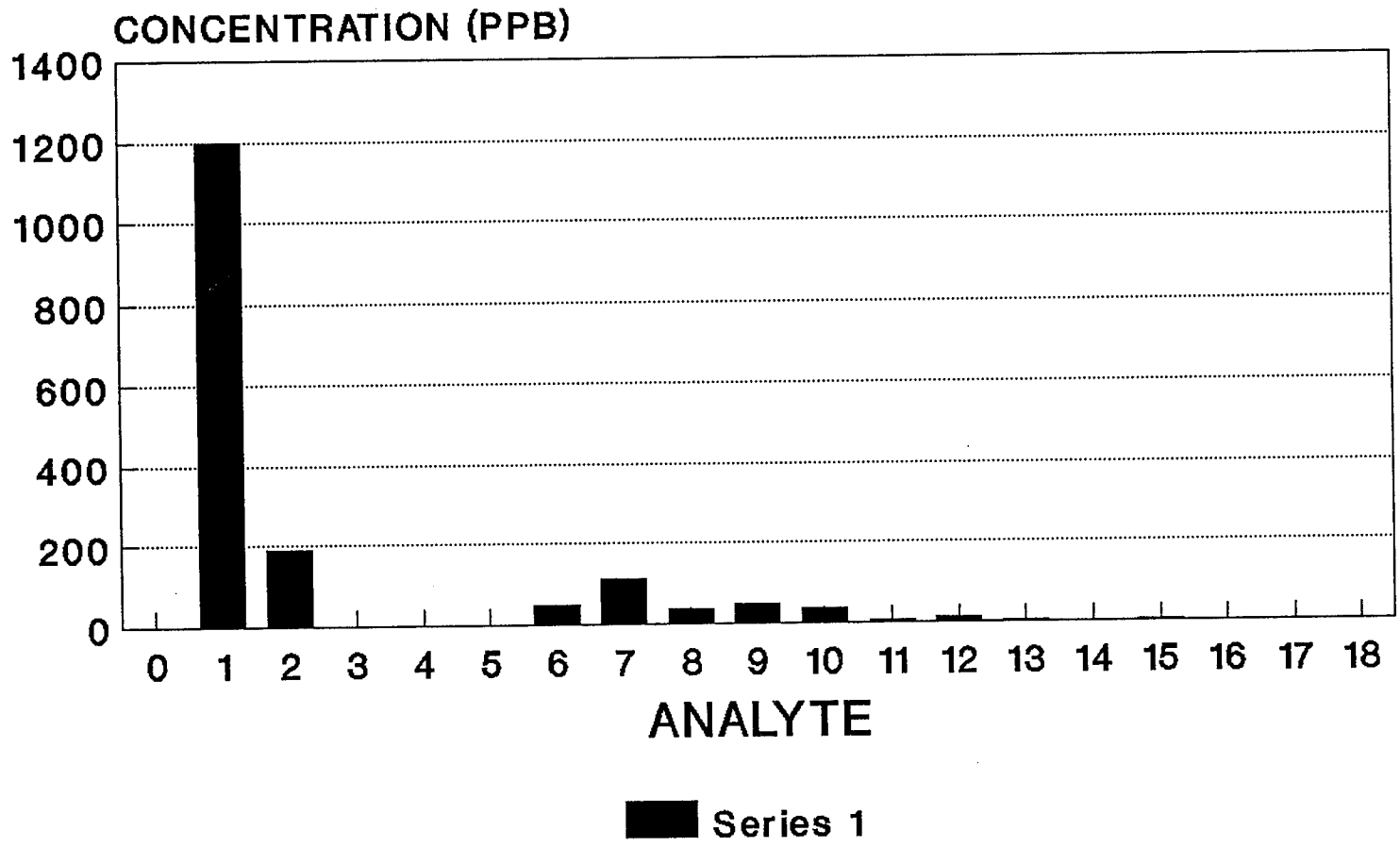
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-17 (8'-10')



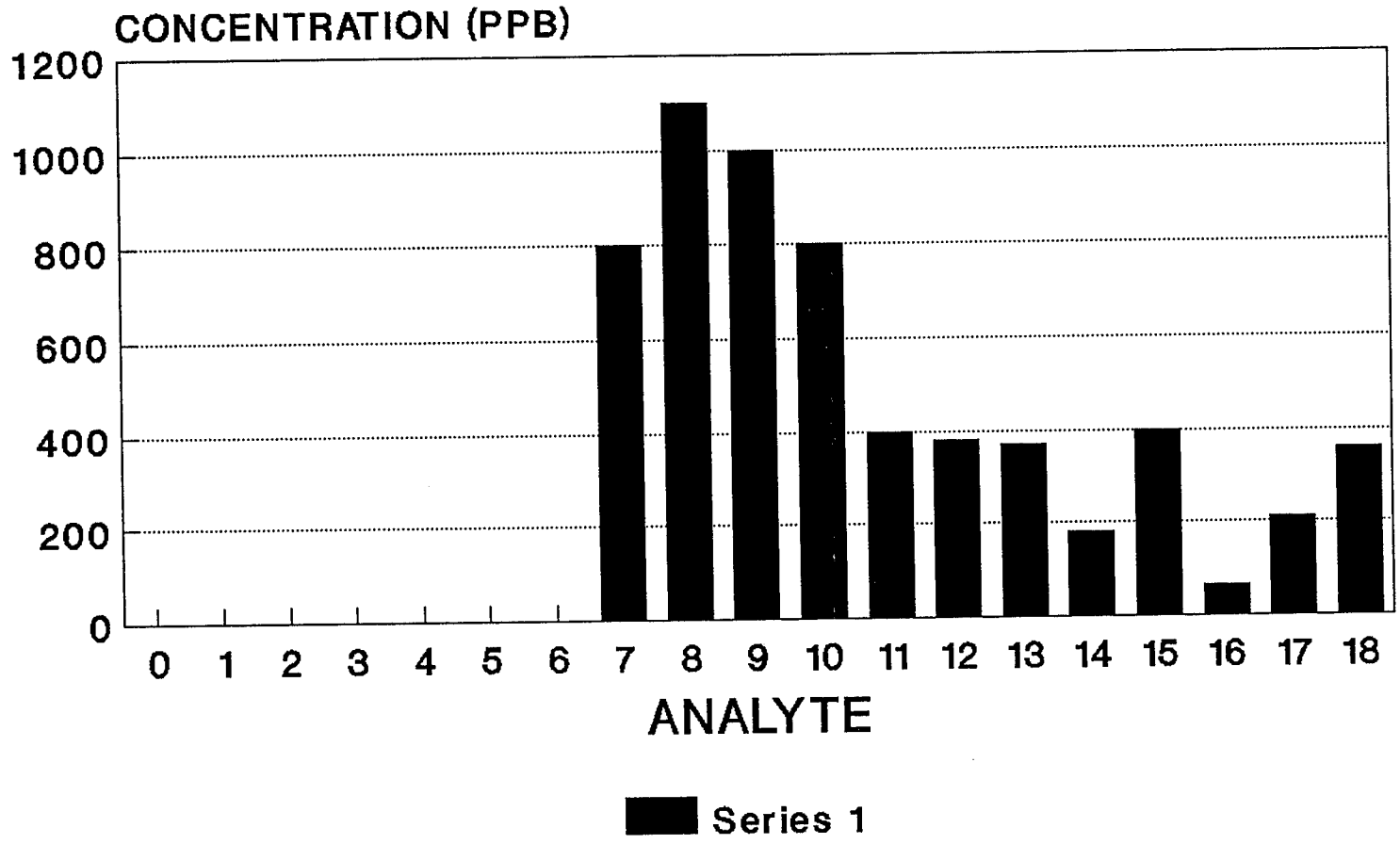
OSMOSE WOOD PRESERVING, INC

PAH PROFILE MW-17 (18'-20')



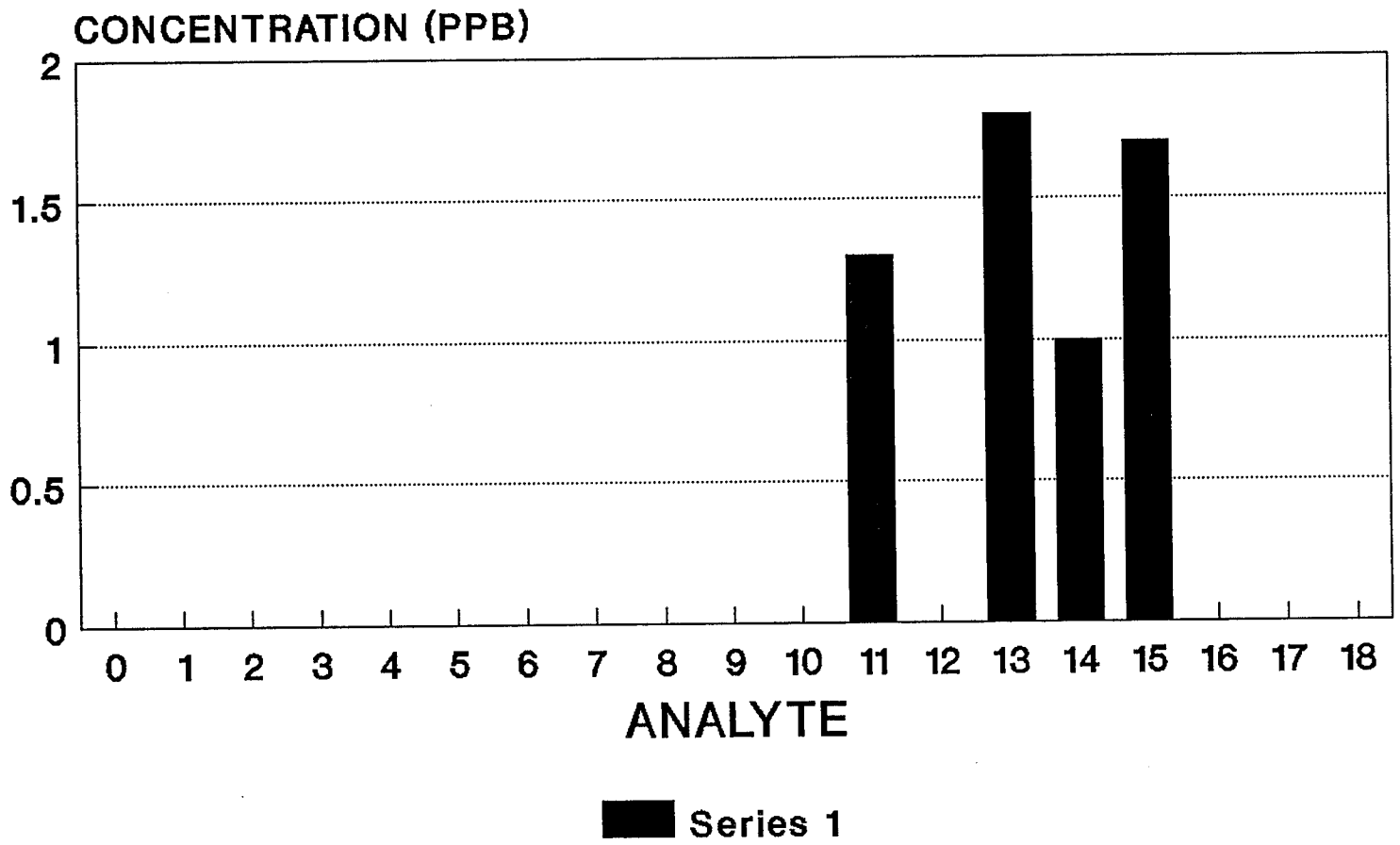
OSMOSE WOOD PRESERVING, INC

PAH PROFILE MW-18 (2'-4')



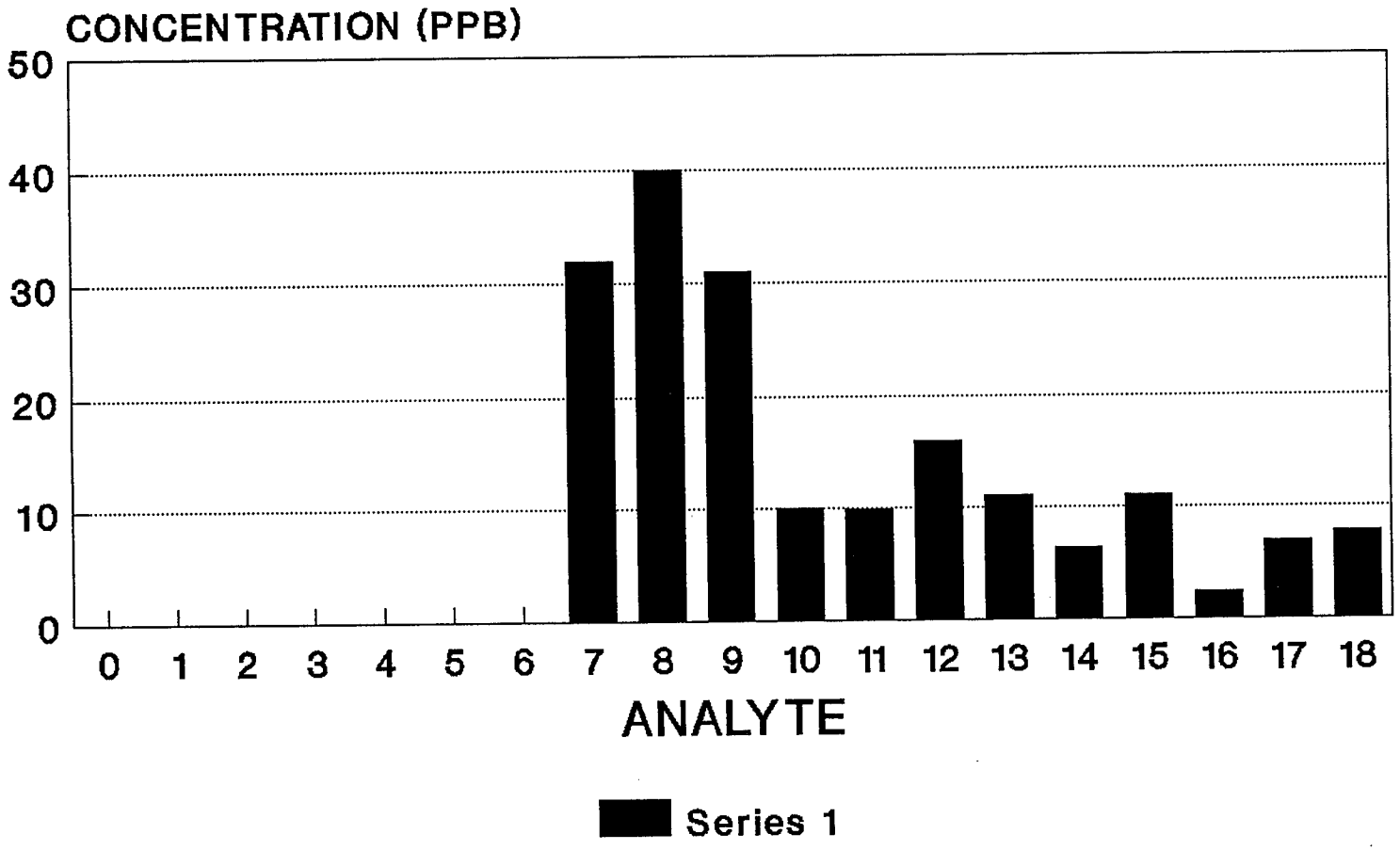
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-18 (39'-41')



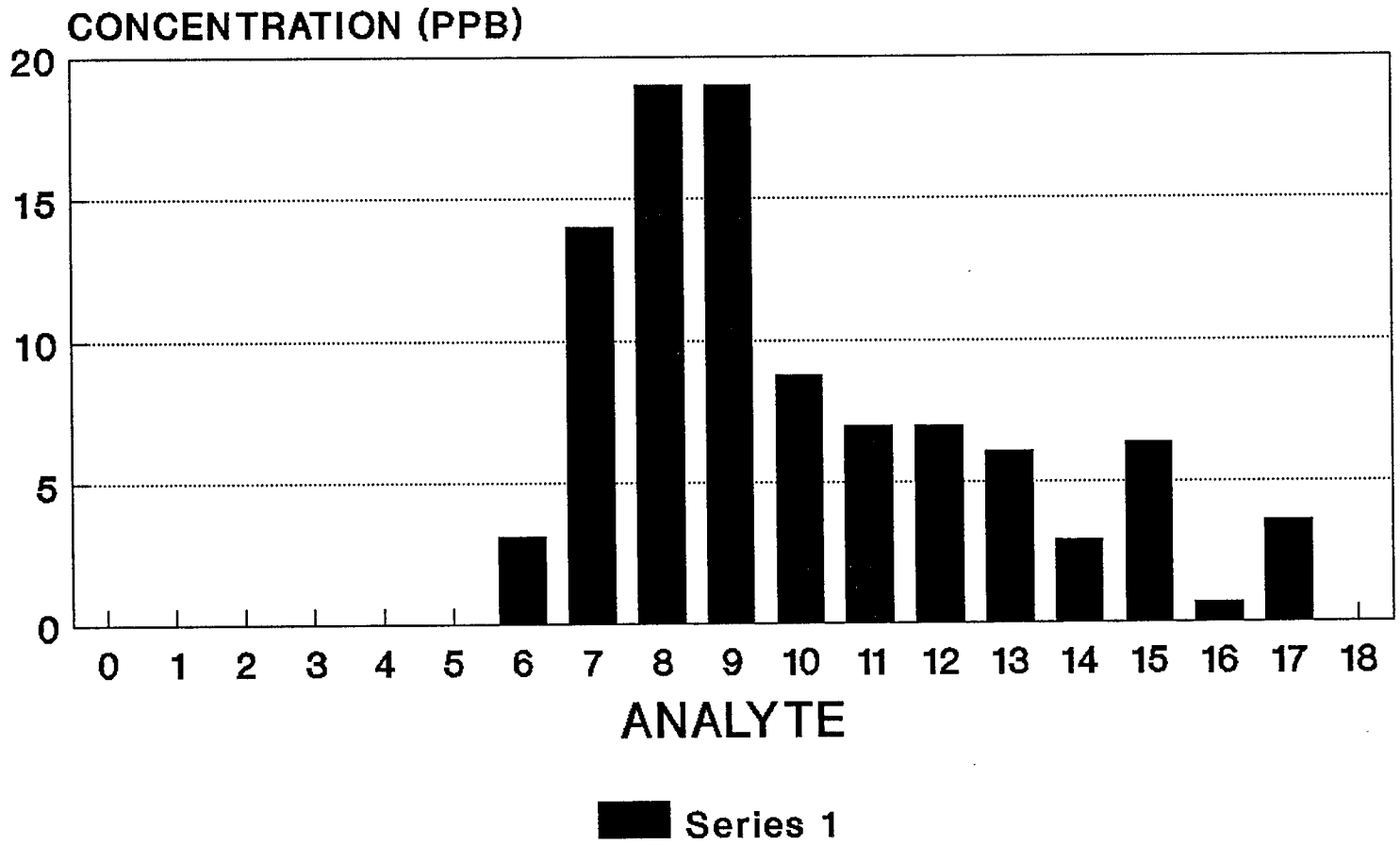
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-18 (57'-58')



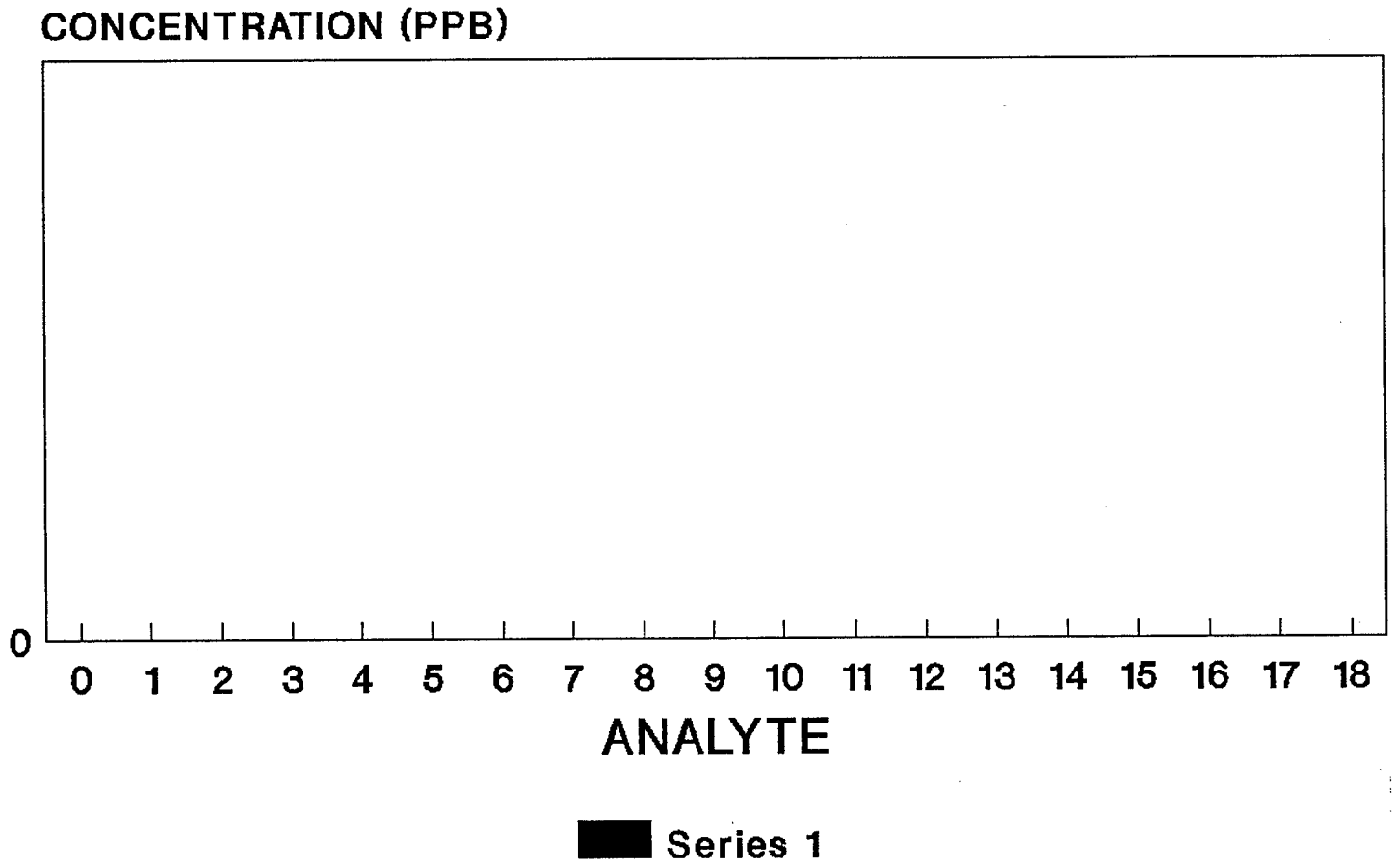
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-19 (2'-4')



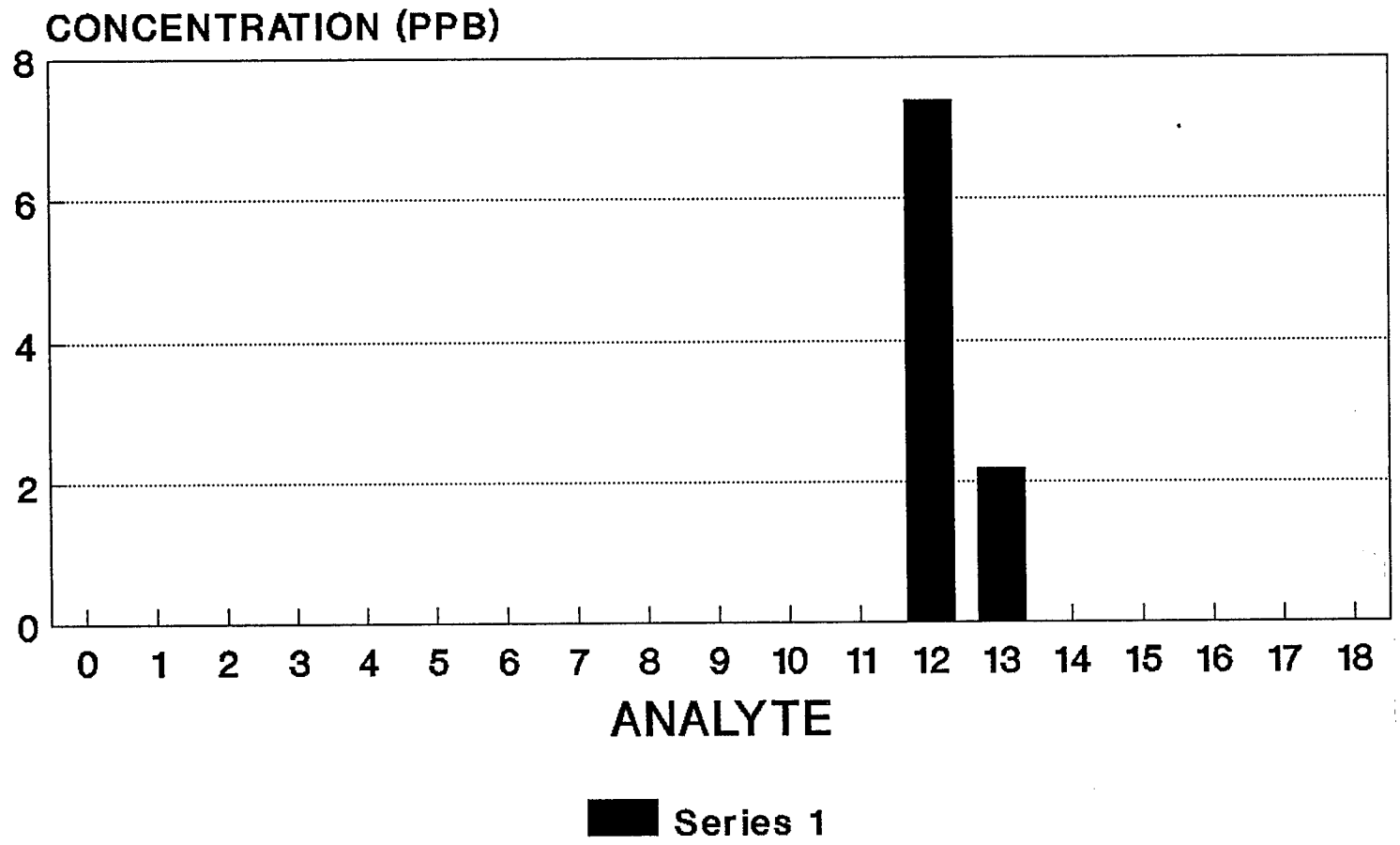
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-19 (54'-55')



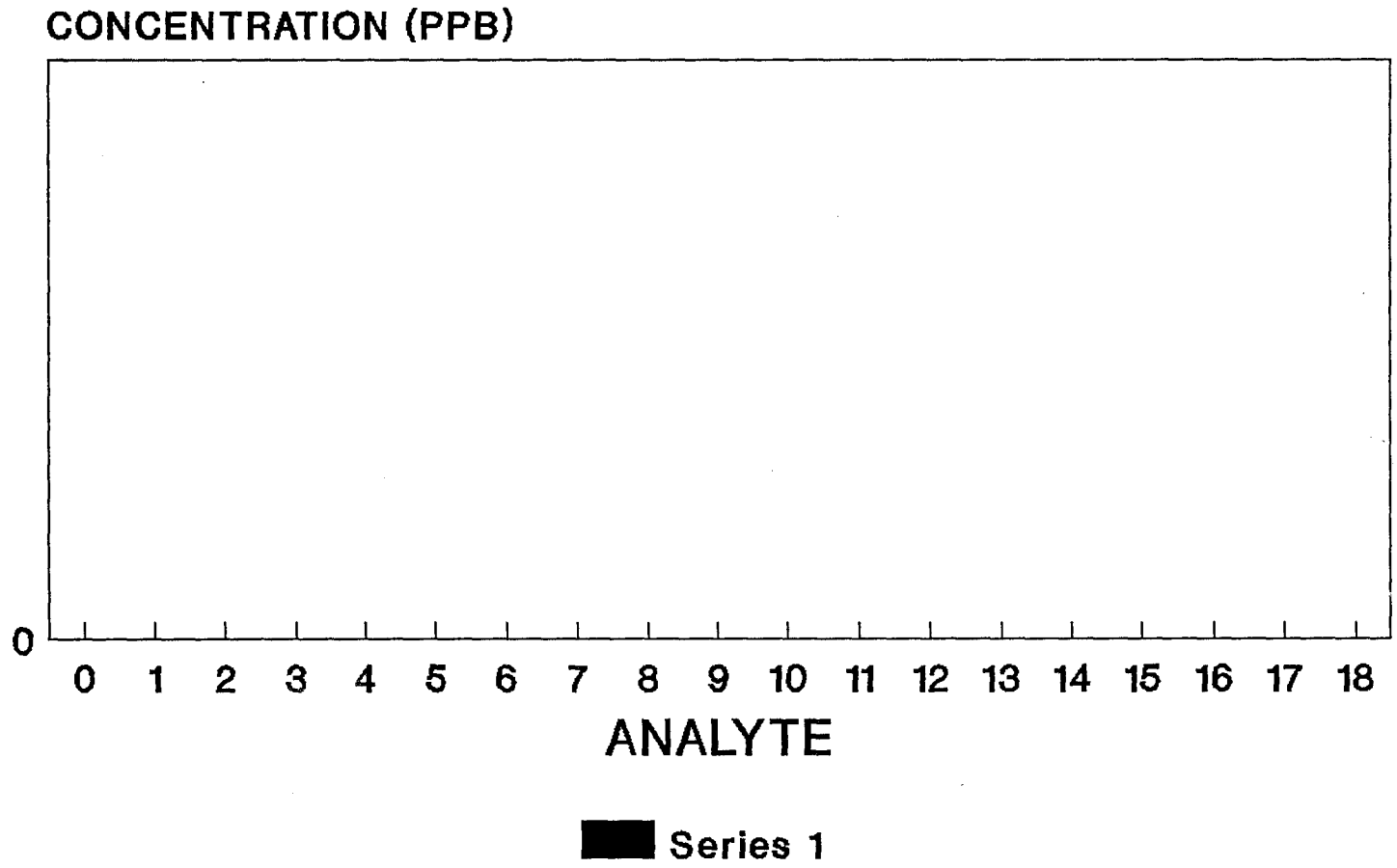
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-20 (6'-7')



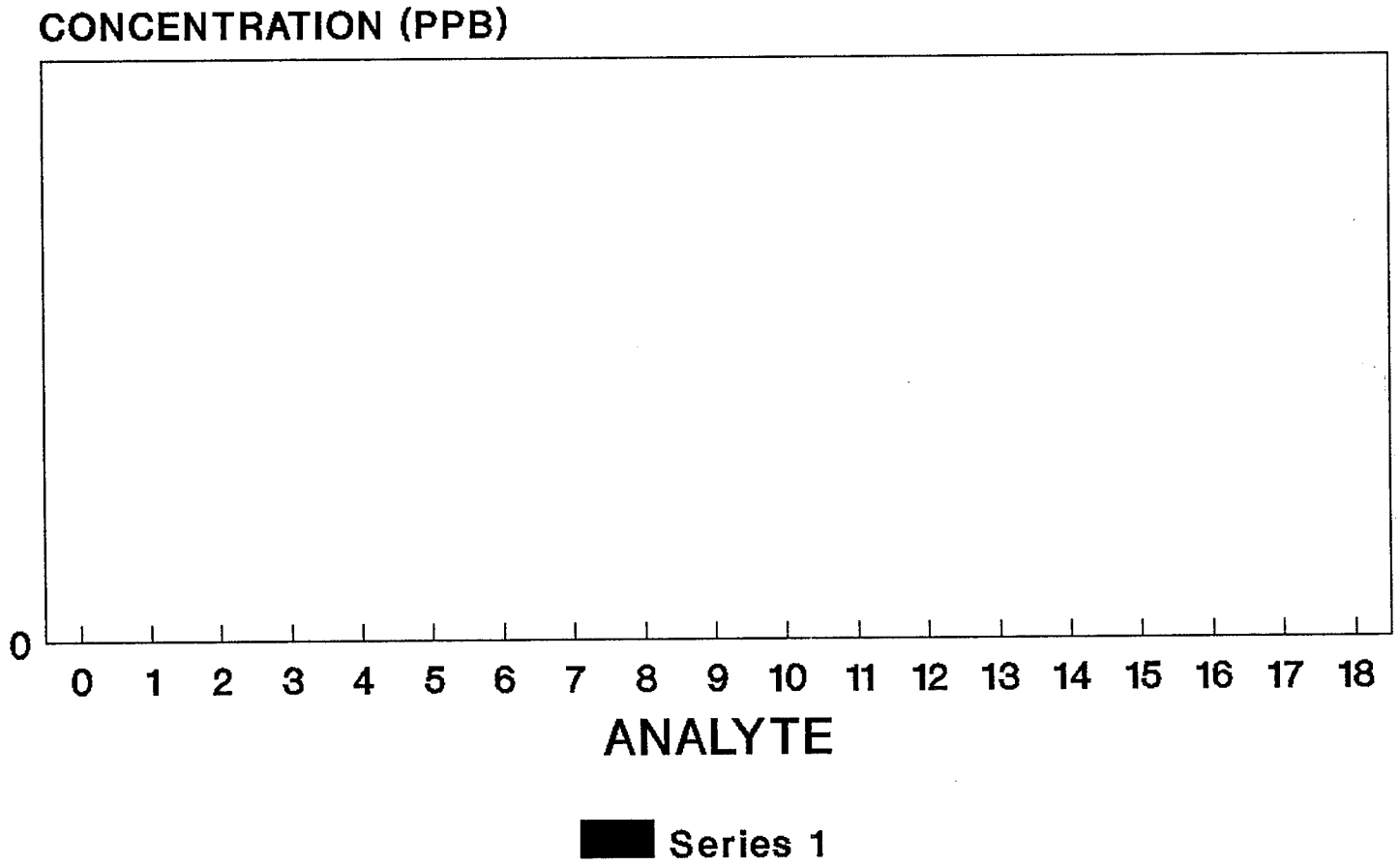
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-20 (7'-8')



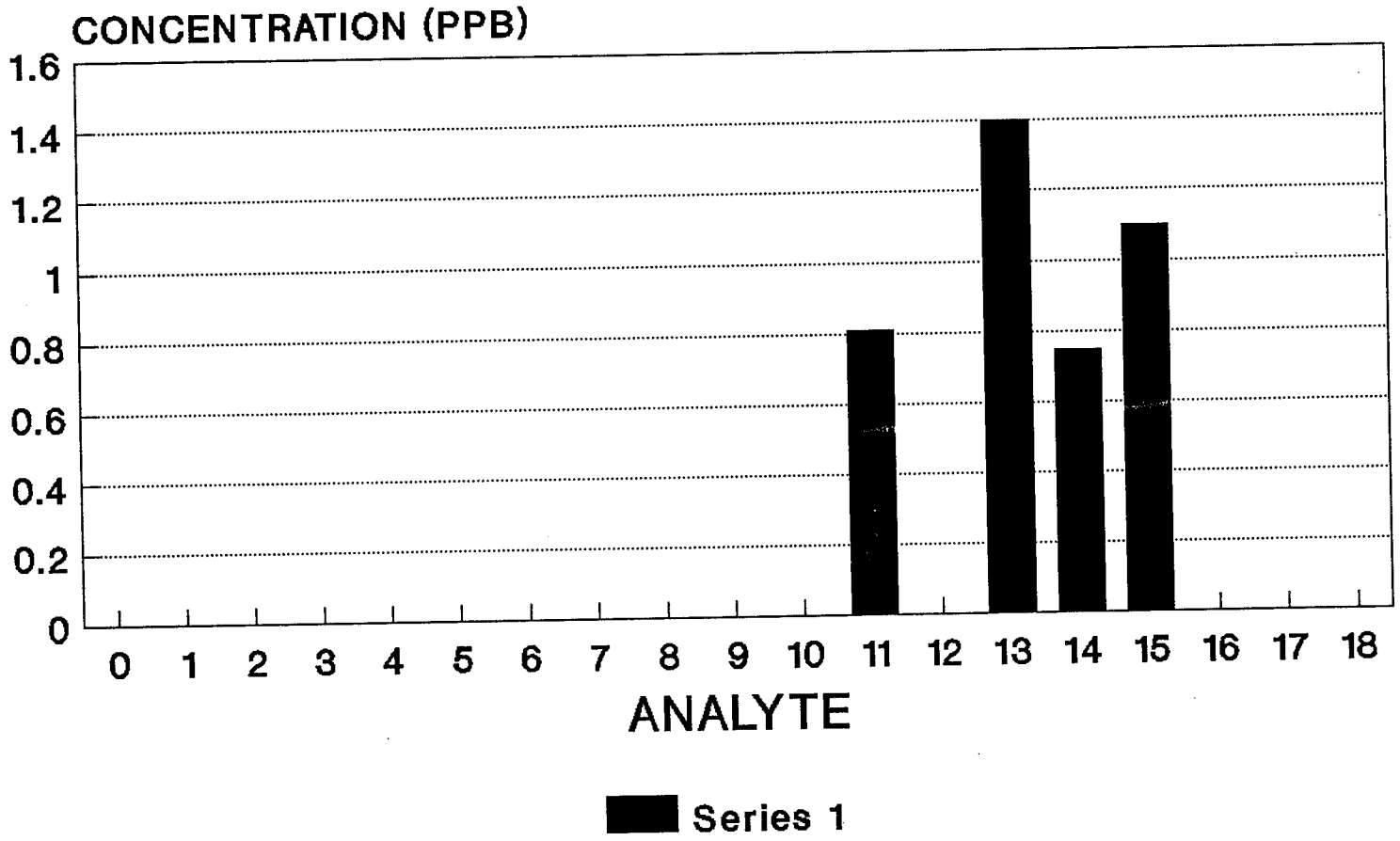
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-20 (18'-20')



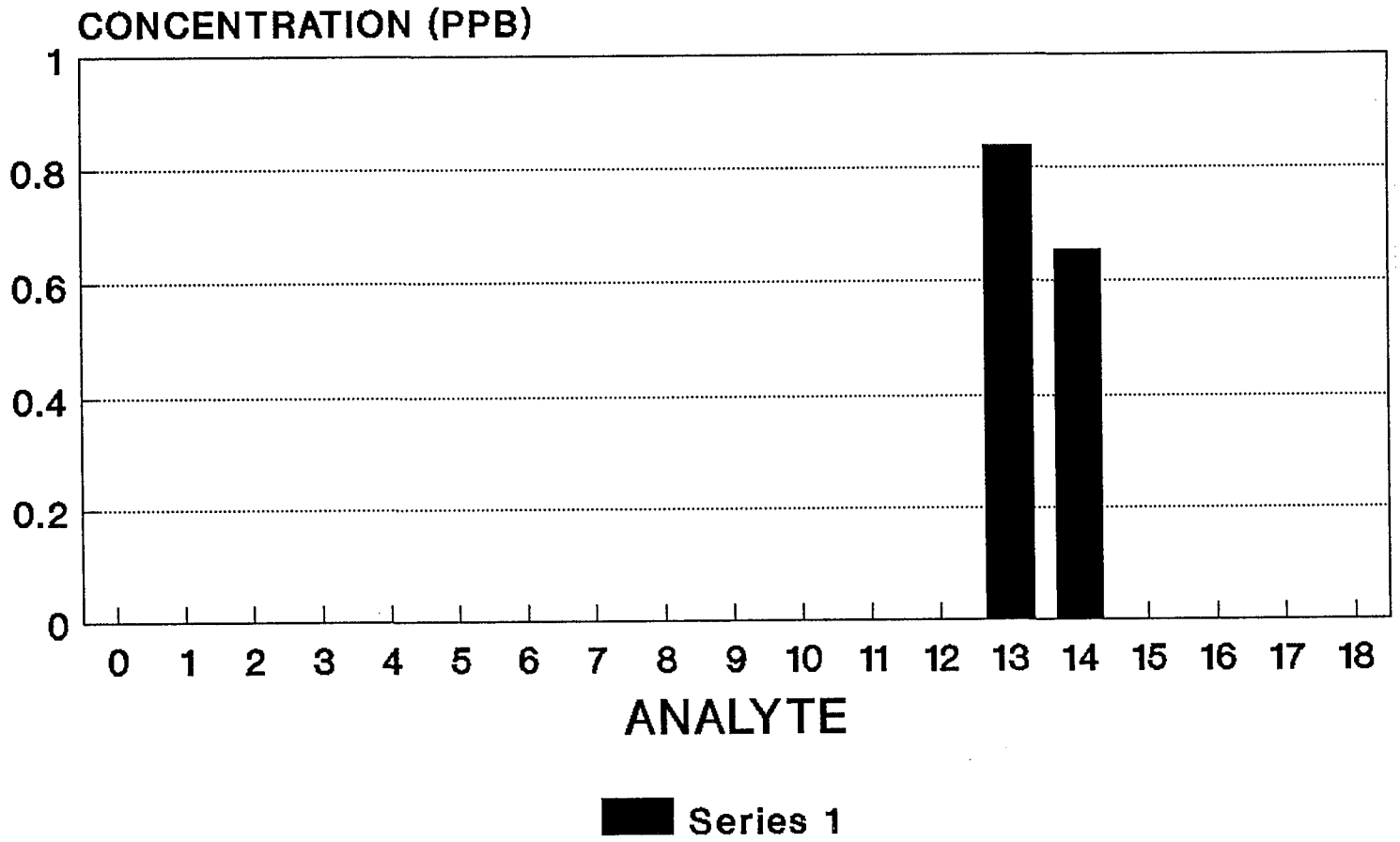
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-21 (6'-7')



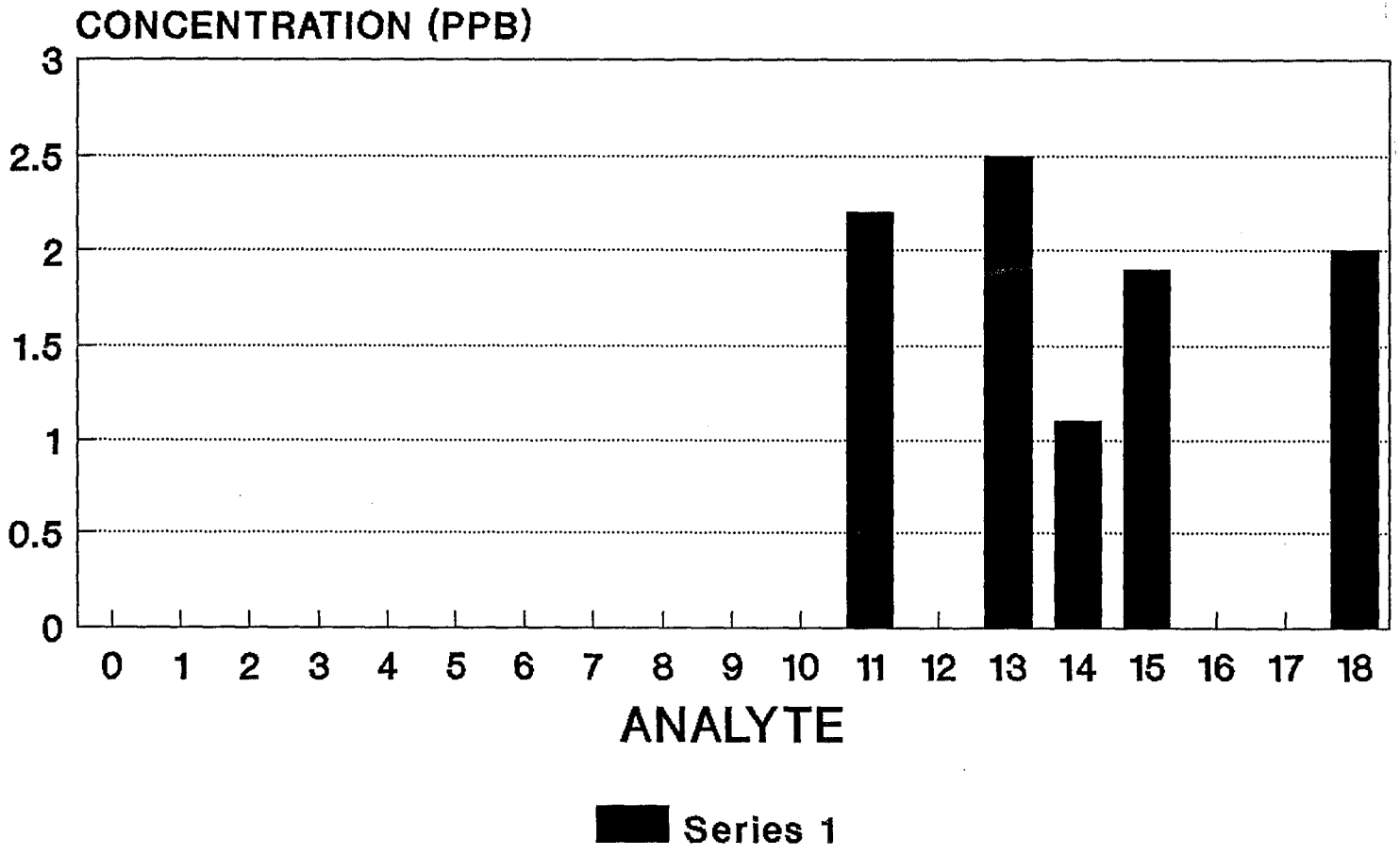
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-21 (7'-8')



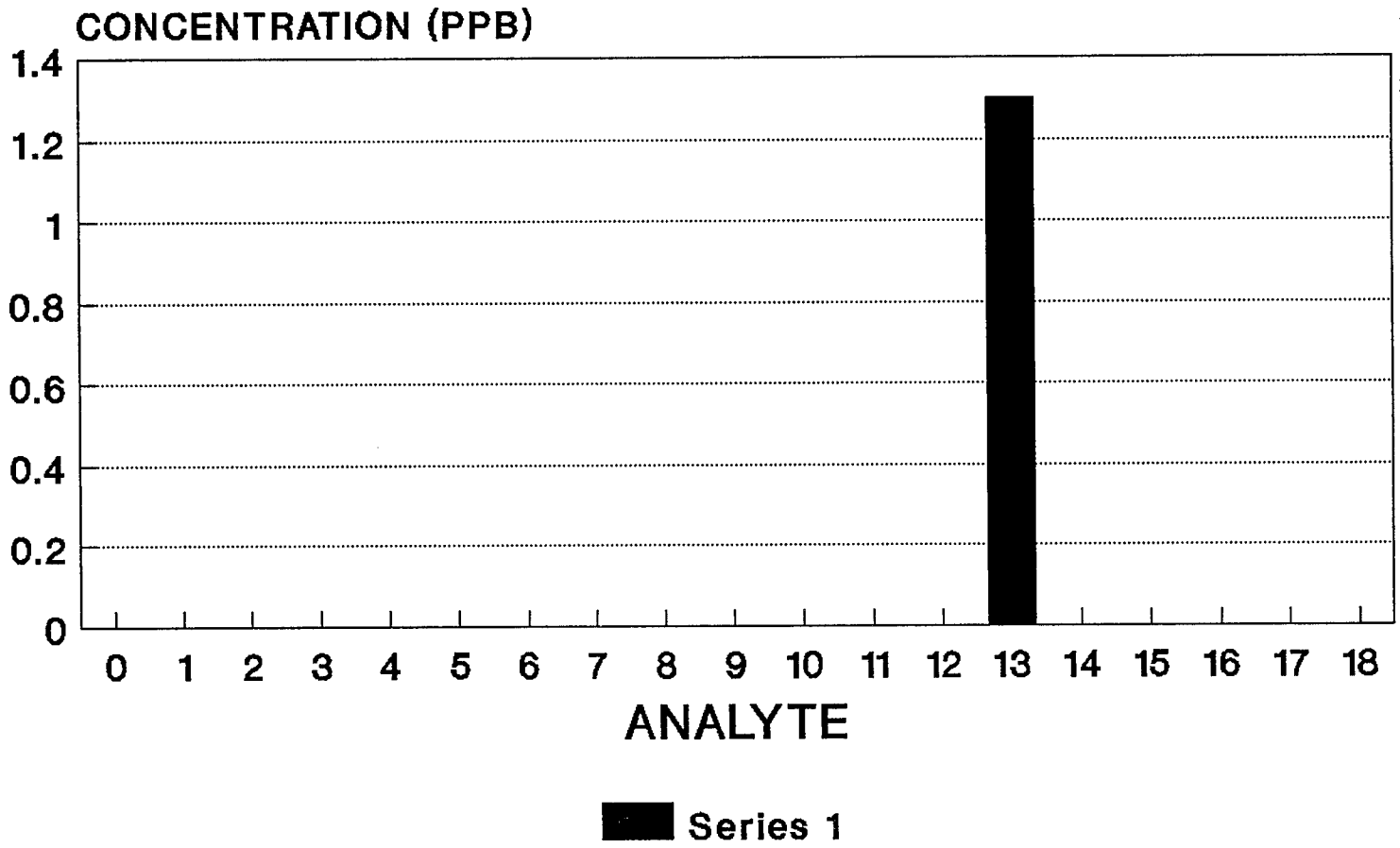
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-21 (18'-20')



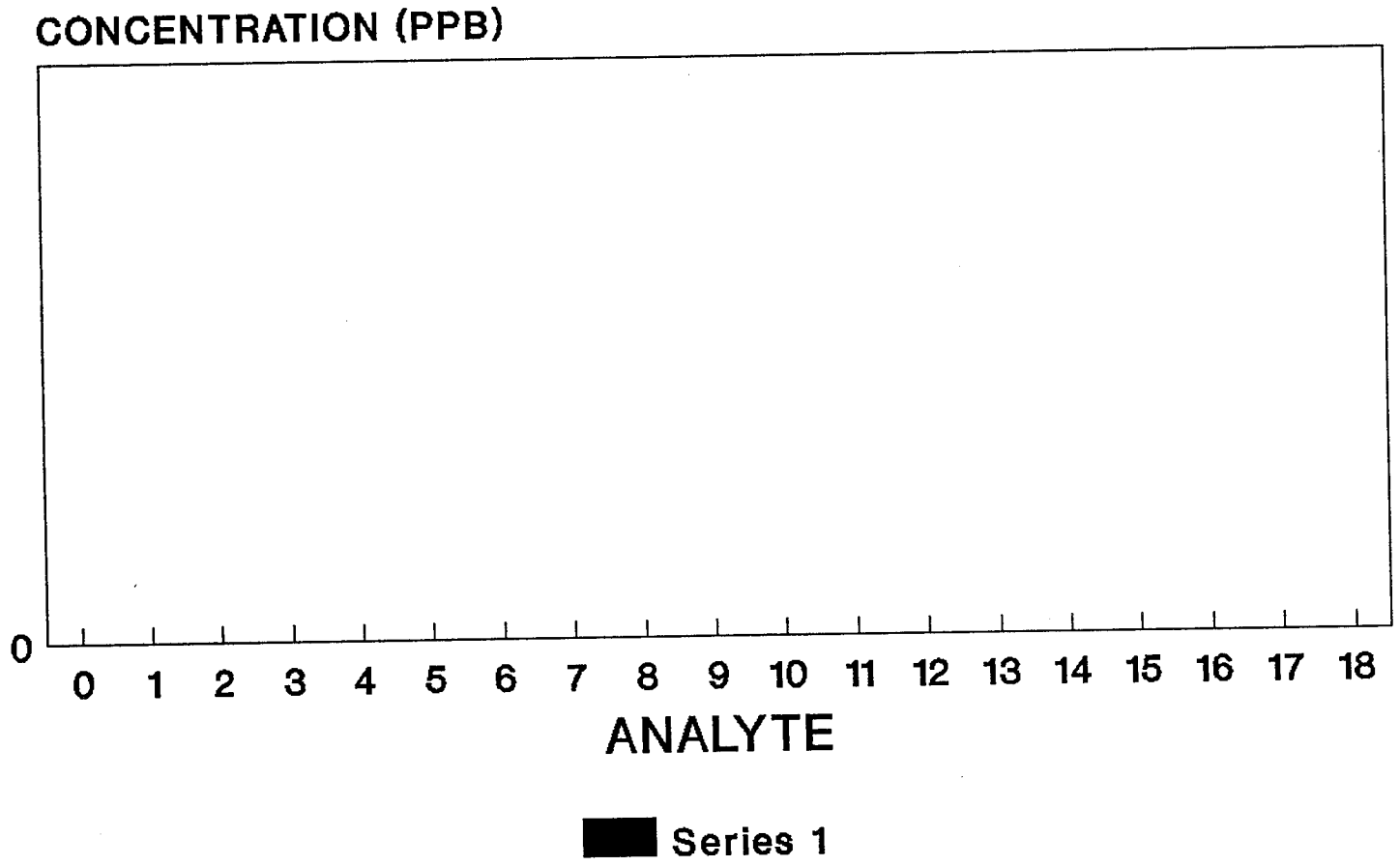
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-22 (4'-6')



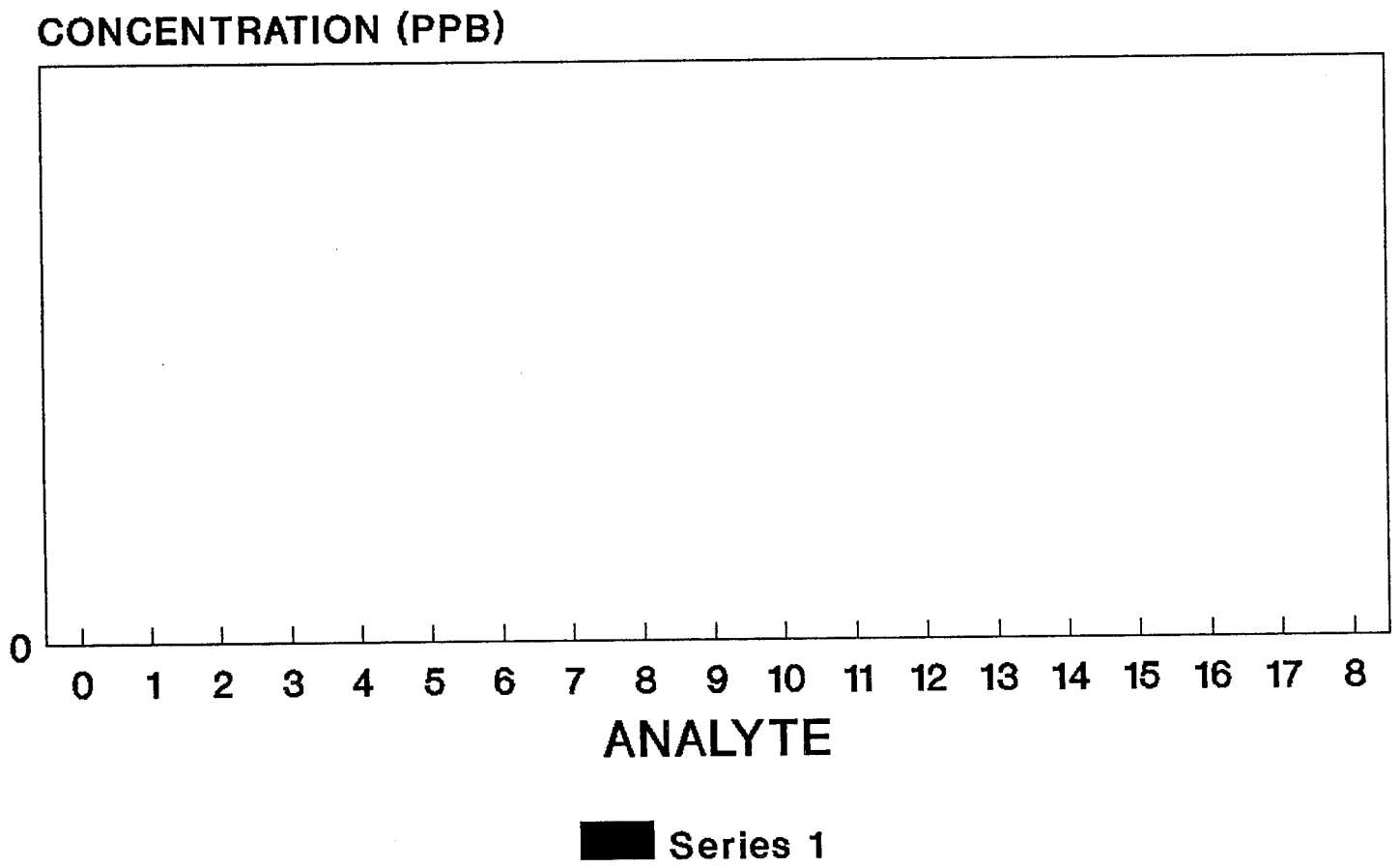
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-22 (10'-12')



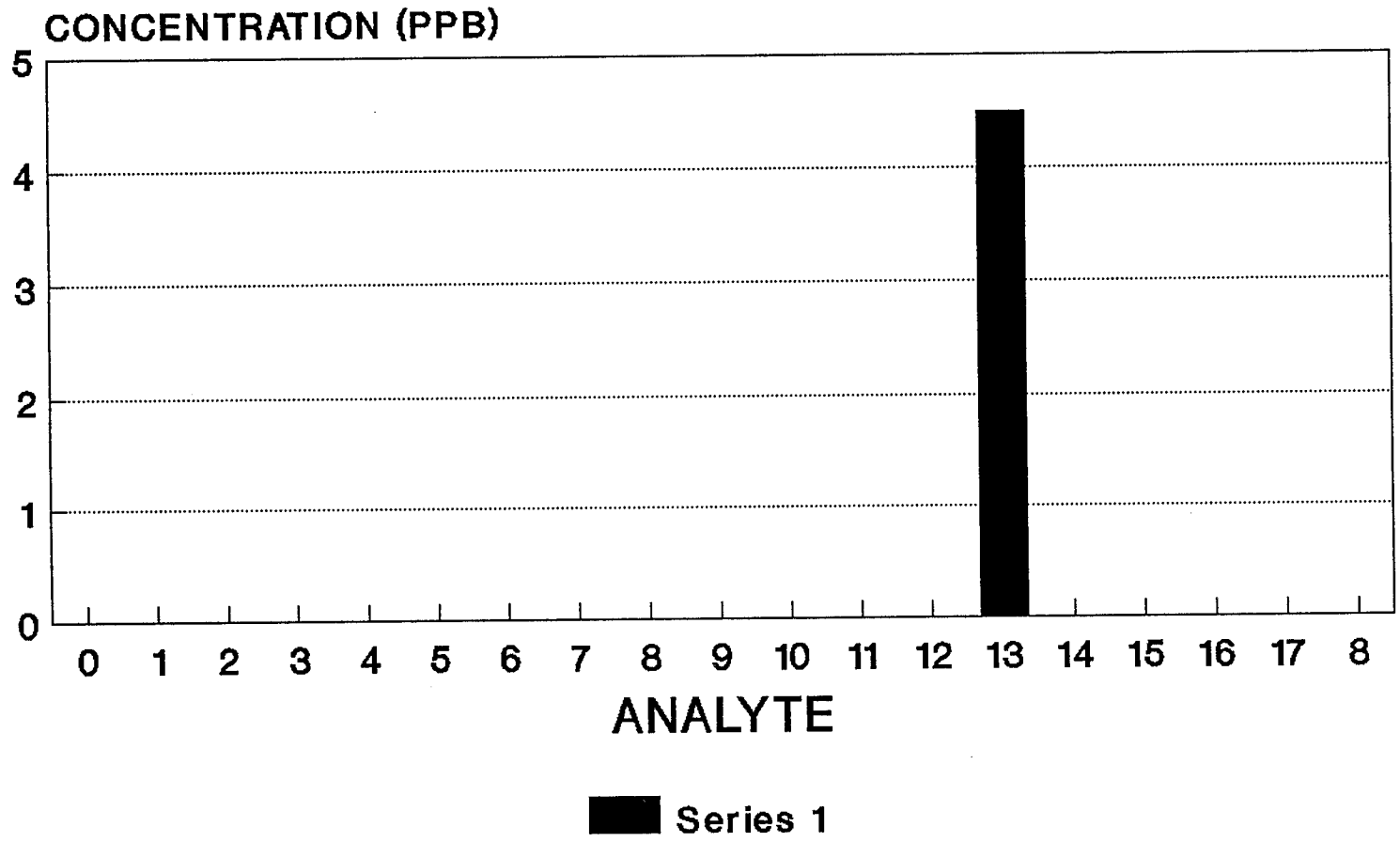
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-22 (23'-25')



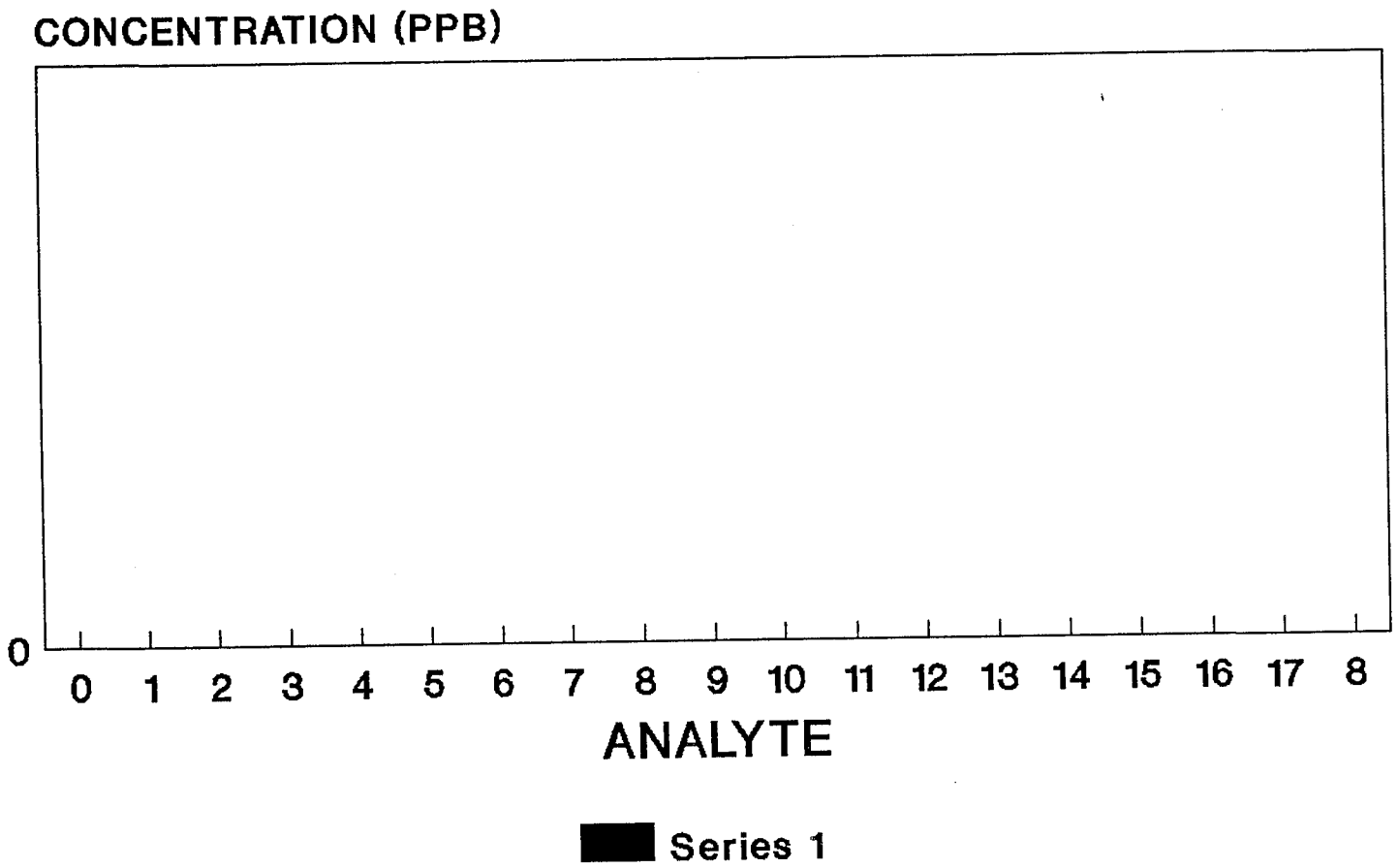
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-23 (6'-8')



OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-23 (16'-18')



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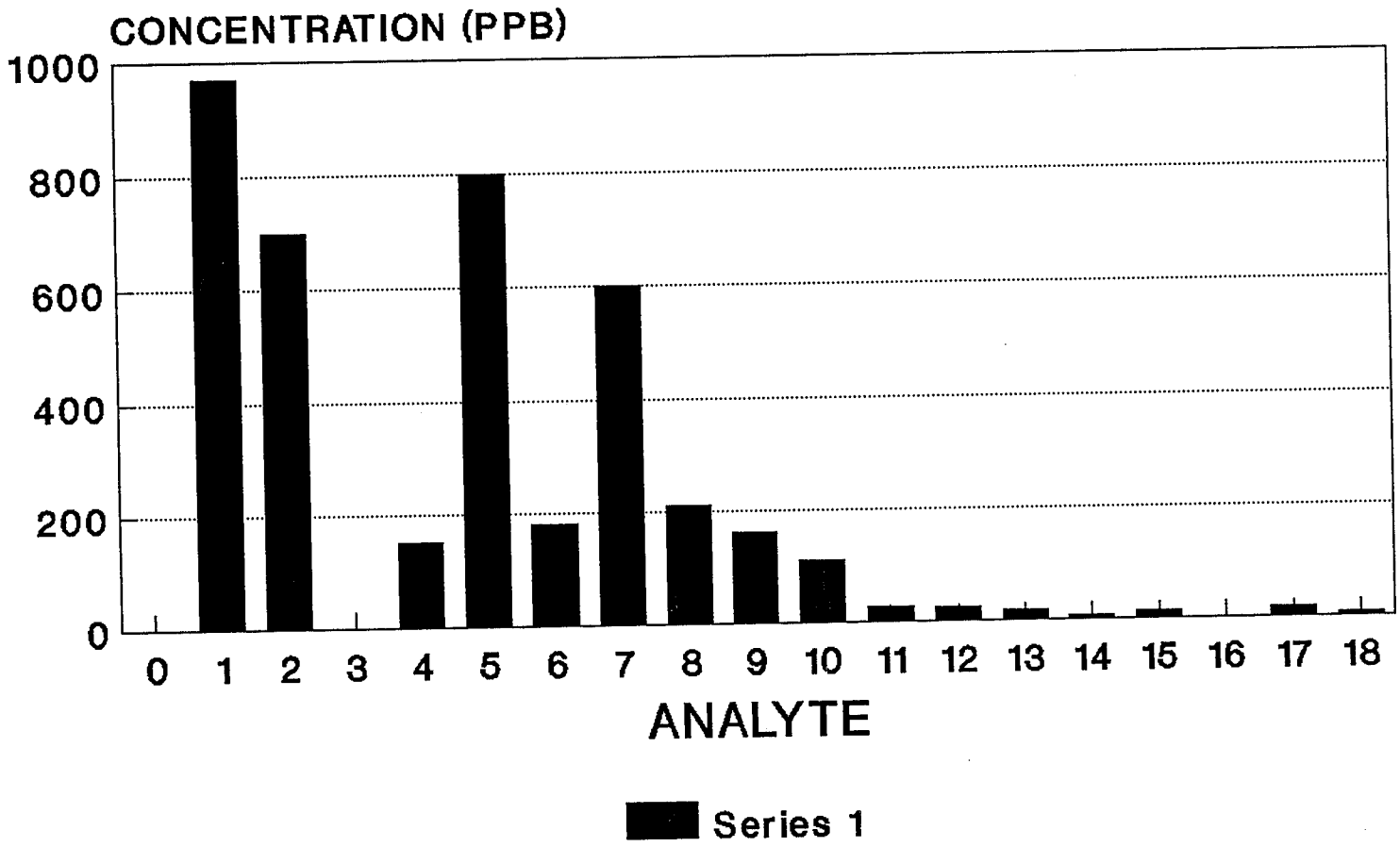
PAH PROFILE MW-24 (8'-10')



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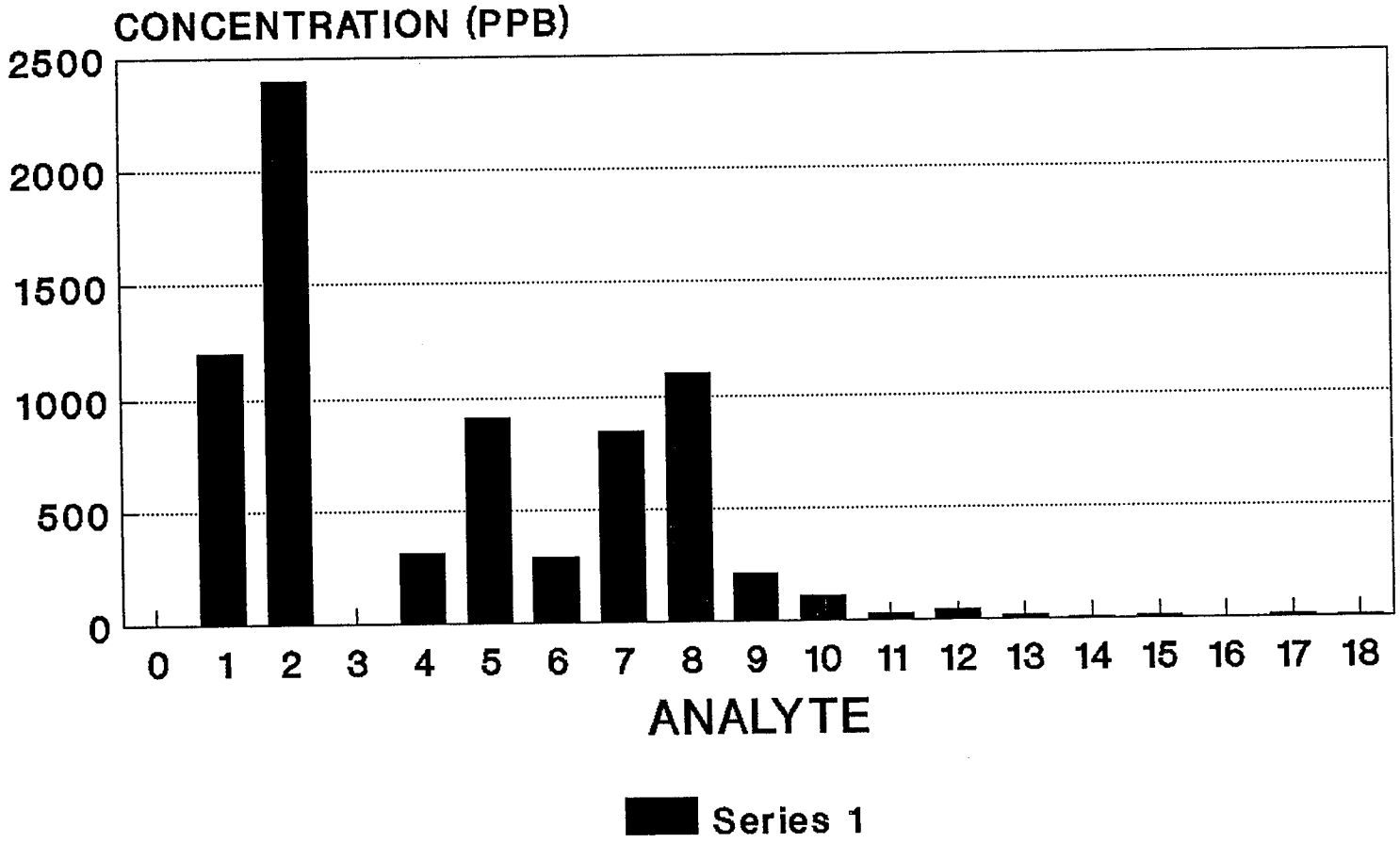
PAH PROFILE MW-24 (10'-12')



OSMOSE WOOD PRESERVING, INC.

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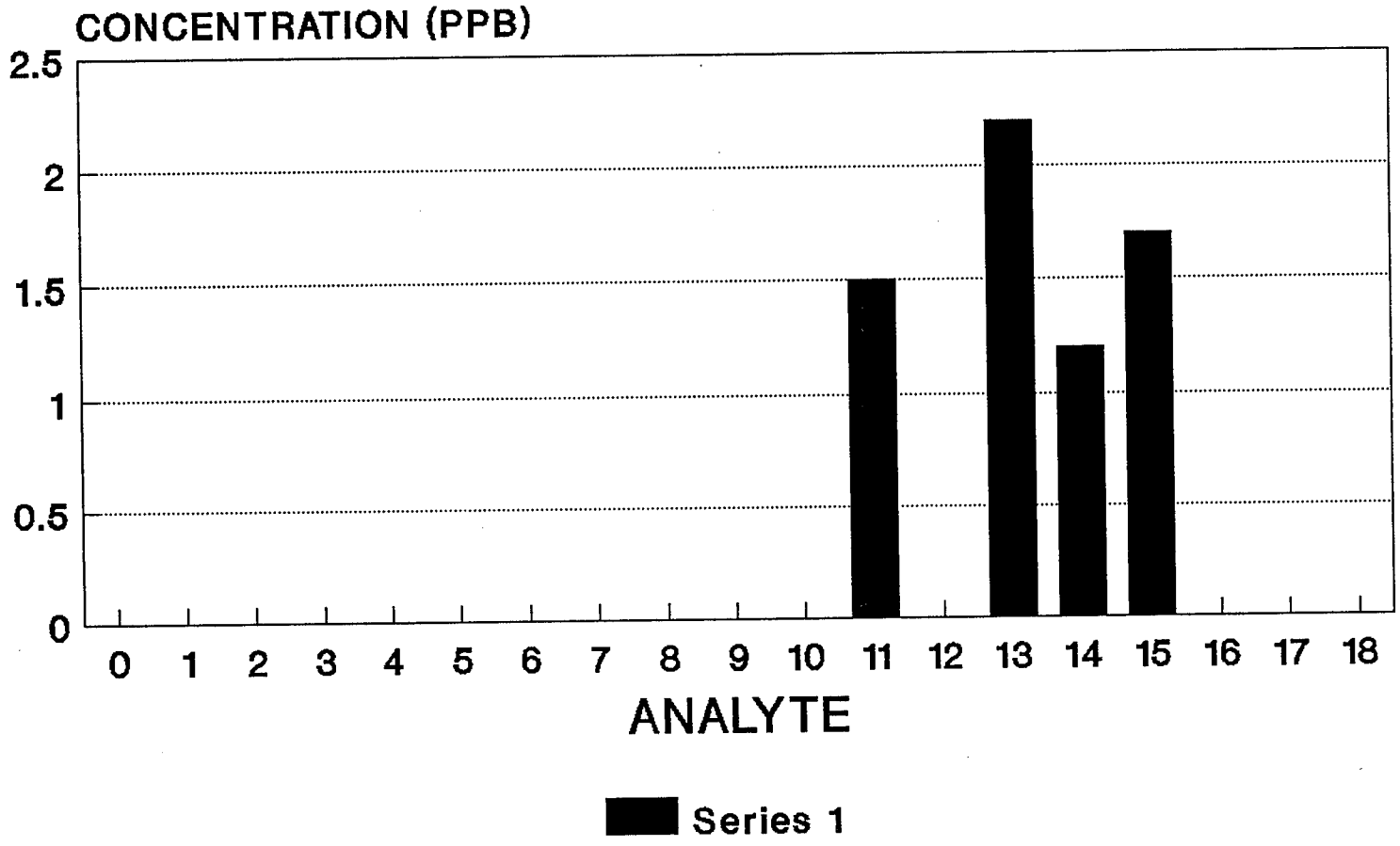
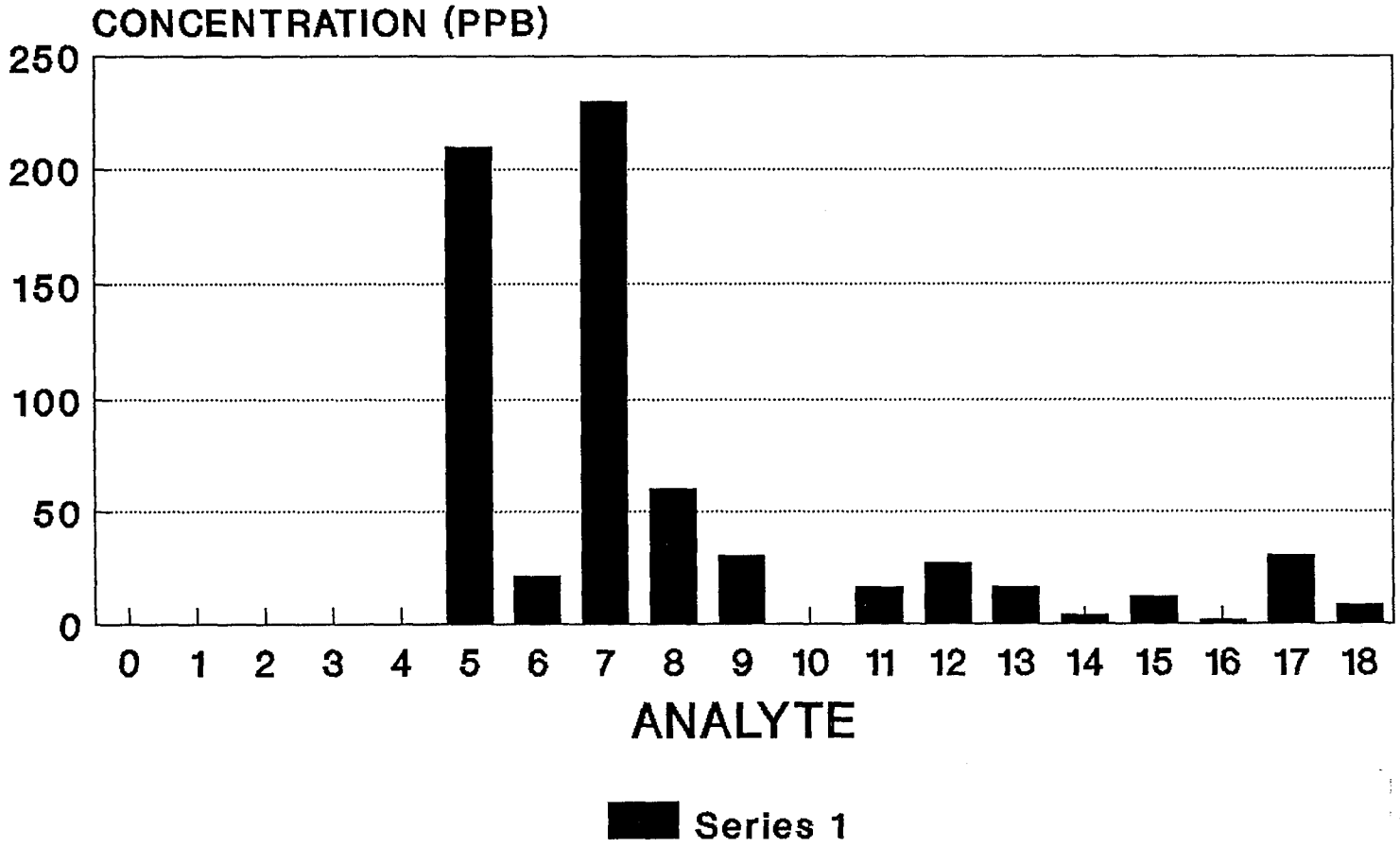


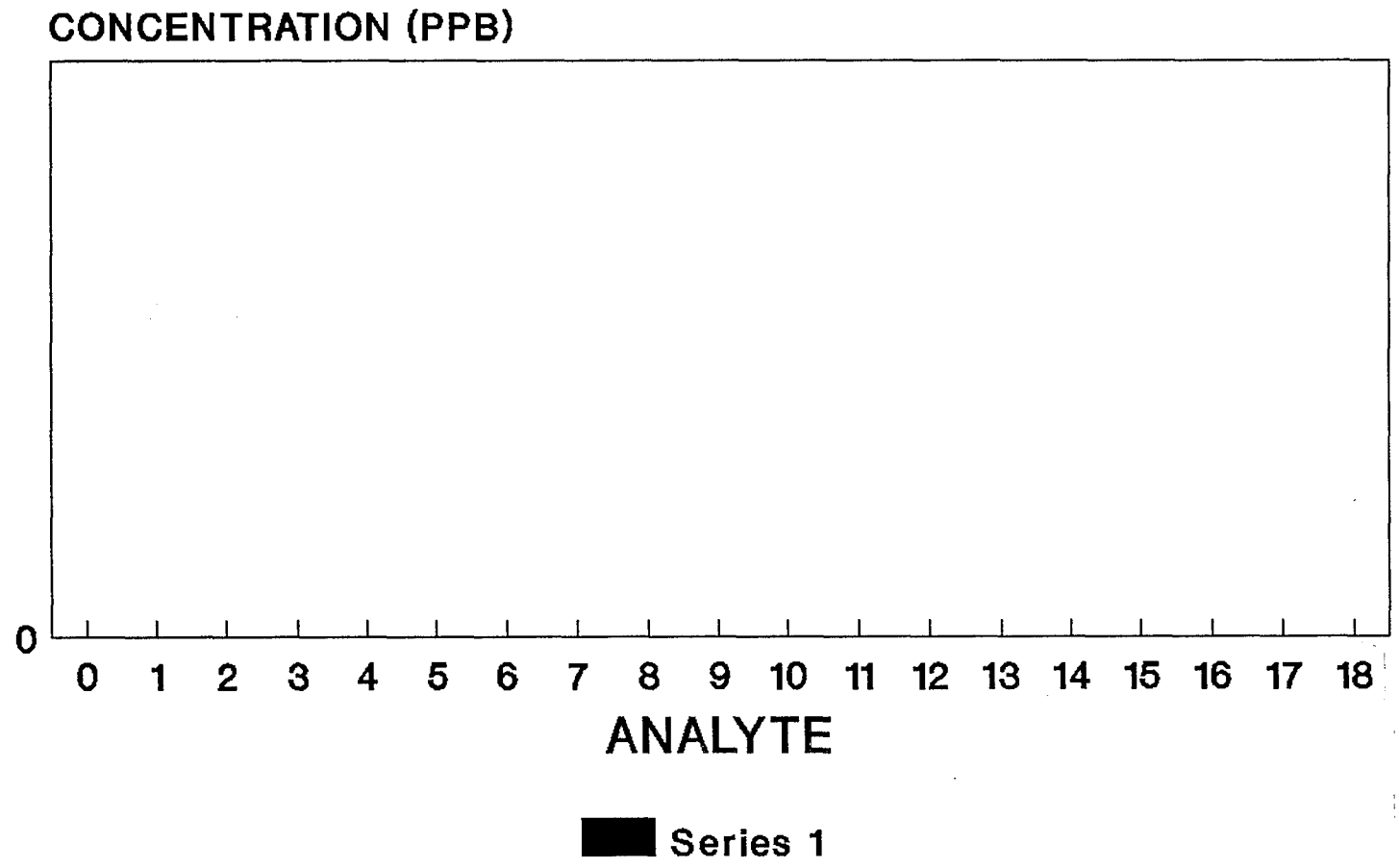
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-26 (8'-10')



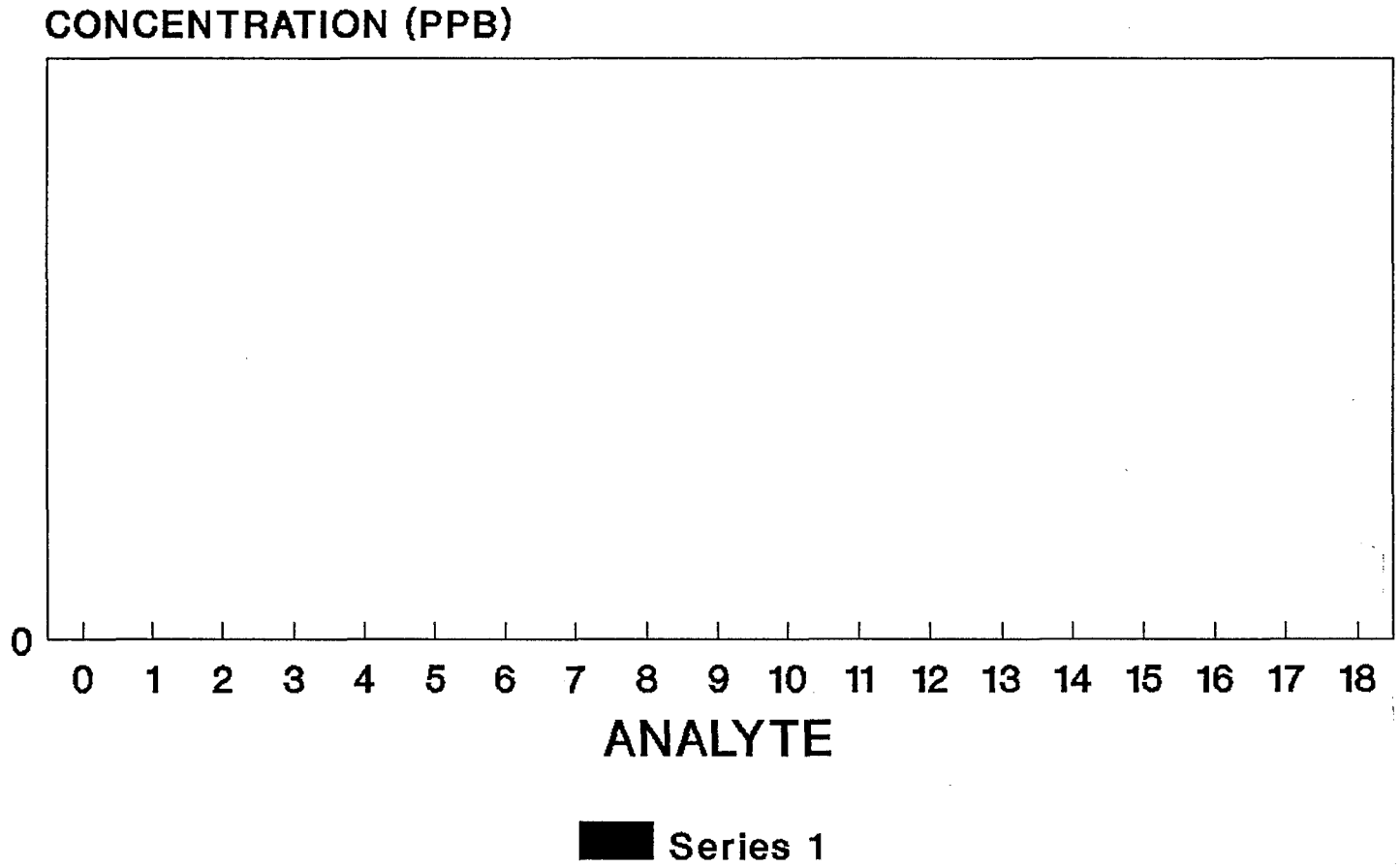
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-26 (10'-12')



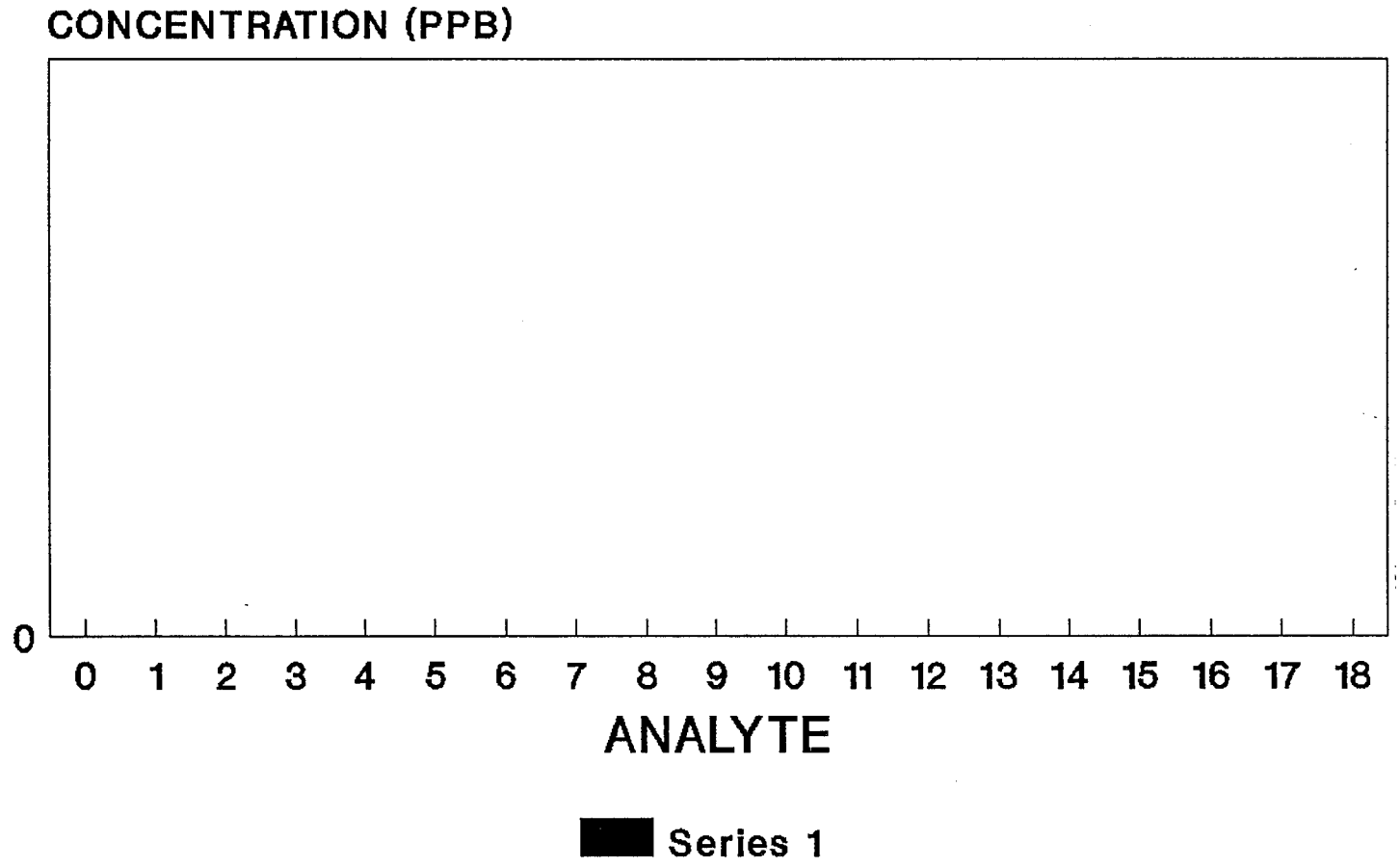
OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-26 (18'-20')



OSMOSE WOOD PRESERVING, INC.

PAH PROFILE MW-26 (18'-20')



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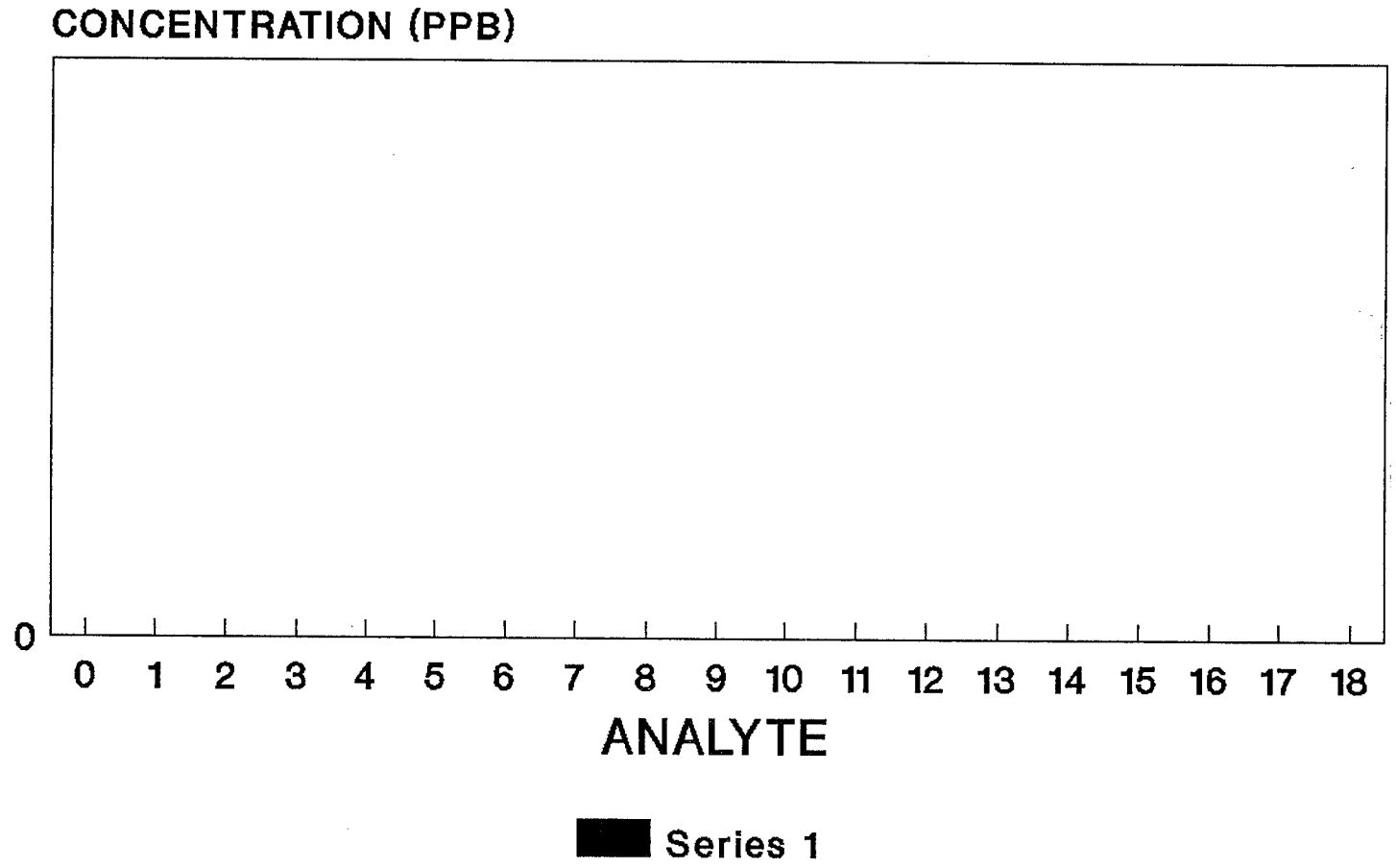
PAH PROFILE MW-27 (7'-8')



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HYDROCARBON MASS ESTIMATE - ASSUMPTIONS

Liquid Phase

1) LNAPL thickness was assumed to average 0.02 feet across the area shown in Figure 9. True LNAPL thickness is very hard to estimate from monitoring well observations.

Adsorbed Phase

2) Across the area shown in Figure 15, adsorbed PAHs were approximated by zones of 400 ppm from 6 to 7 feet below grade, 750 ppm from 7 to 10 feet below grade, and 100 ppm from 10 to 12 feet below grade.

3) A second zone of lower concentration soils surrounding the area described above was included in the calculation, extending beyond the area shown in Figure 15 to the north and south to surround monitoring wells CW-2, MW-15, and MW-17. This zone was defined as containing 50 ppm PAHs from 6 to 7 feet below grade, and 100 ppm PAHs from 7 to 12 feet below grade.

4) Volatile compounds in soils were approximated by two zones across the entire area described above in #2 and #3: one from 6 to 7 feet below grade (1.5 ppm volatiles), and one from 7 to 10 feet below grade (5 ppm volatiles).

Dissolved Phase

5) Dissolved-phase hydrocarbon mass was estimated by assigning an average concentration of 15 ppm total hydrocarbons to the area within the 10 ppm contour on Figure 10, and an average concentration of 5 ppm total hydrocabons to the area within the 1 ppm contour but outside the 10 ppm contour. These concentrations were assumed to apply to the upper 5 feet of the aquifer.

6) Volatile concentrations in groundwater were much lower than PAH concentrations; therefore volatile and PAH concentrations were combined in the calculation.

General

7) Hydrocarbon concentrations below 10 ppm in soils and below 1 ppm in groundwater were not included in the calculation, since the amount of hydrocarbon mass they represent is small.

8) An average soil porosity of 0.40 was chosen, based upon the predominant soil type in the impacted zone (a fairly uniform silt with some fine sand).

9) An average soil density of 2 g/cc was chosen, once again based upon the soil type.

OSMOSE WOOD PRESERVING
MASS BALANCE ESTIMATE

LIQUID PHASE HYDROCARBONS

Percent of Total = 55.48%

Area	Area (ft*ft)	Thickness (ft)	Volume (ft*ft*ft)	Porosity	Pore Volume (ft*ft*ft)	Volume (gallons)	Hydrocarbons (lbs.)	
L-1	6,450	0.02	129	0.4	52	386	3222.8	creosote = 8.35 lbs/gal
Totals	6,450		129		52	386	3223	

DISSOLVED PHASE HYDROCARBONS

Percent of Total = 0.33%

Area	Area (ft*ft)	Thickness (ft)	Volume (ft*ft*ft)	Porosity	Pore Volume (ft*ft*ft)	Volume (liters)	HC conc. (mg/l)	Hydrocarbons (mg)	Hydrocarbons (lbs.)	
D-1	8,900	5	44,500	0.4	17,800	504,025	15.000	7,560,372	16.7	Volatiles and PAHs
D-2	3,700	5	18,500	0.4	7,400	209,538	5.000	1,047,692	2.3	Volatiles and PAHs
Totals	12,600		63,000		25,200	713,563			19	

UNSATURATED ADSORBED PHASE HYDROCARBONS

Percent of Total = 6.00%

Area	Area (ft*ft)	Thickness (ft)	Volume (ft*ft*ft)	Volume (cc)	Soil Density (g/cc)	Soil Wt. (g)	HC conc. (mg/kg)	Hydrocarbons (mg)	Hydrocarbons (lbs.)	
U-1	6,450	1	6,450	182,644,753	1.99	363,463,059	400	145,385,224	321	Area 2, 6'-7', (400 ppm)
U-2	3,800	1	3,800	107,604,661	1.99	214,133,275	50	10,706,664	24	Expanded Area 2, 50 ppm, 6'-7'
U-3	10,250	1	10,250	290,249,414	1.99	577,596,334	1.5	866,395	1.9	Volatiles, expanded area 2, 6'-7', 1.5 ppm
U-4	400	2	800	22,653,613	1.99	45,080,689	25	1,127,017	2.5	Area 1, 2'-4', 25 ppm
Totals	4,521,541		21,300						349	

SATURATED ADSORBED PHASE HYDROCARBONS

Percent of Total = 38.19%

Area	Area (ft*ft)	Thickness (ft)	Volume (ft*ft*ft)	Volume (cc)	Soil Density (g/cc)	Soil Wt. (g)	HC conc. (mg/kg)	Hydrocarbons (mg)	Hydrocarbons (lbs.)	
S-1	6,450	3	19,350	547,934,260	1.99	1,090,389,177	750	817,791,882	1,803	Area 2 soils, 7'-10', 750 ppm
S-2	6,450	2	12,900	365,289,506	1.99	726,926,118	100	72,692,612	160	Area 2, 100 ppm soils 10'-12'
S-3	3,800	5	19,000	538,023,304	1.99	1,070,666,375	100	107,066,637	236	Wider area, 100 ppm, 7'-12'
S-4	10250	3	30,750	870,748,242	1.99	1,732,789,002	5	8,663,945	19	Volatiles (entire area, 7'-10'), 5 ppm
Totals	26,950		82,000						2,219	

TOTAL 5809 lbs.

OSMOSE WOOD PRESERVING

Hydrocarbon Mass Distribution