

September 18, 1992

Mr. Barney Chan
Hazardous Materials Specialist
Hazardous Materials Division
Department of Environmental Health
Alameda County Health Care Services Agency
80 Swan Way
Oakland, California 94621

Reference: Addendum to Phase II Site Investigation
Work Plan, Pacific Dry Dock Yard I,
1441 Embarcadero, Oakland, California;
Versar Project No. 1457-026

Dear Mr. Chan:

The purpose of this letter is to serve as an addendum to the document entitled "Phase II Site Investigation Work Plan, Pacific Dry Dock Yard I, Western Section, 1441 Embarcadero, Oakland, California" (Phase II work plan), which was submitted to the Alameda County Health Care Services Agency (ACHCSA) on March 12, 1992. All work and sampling described in this letter are proposed by Versar Inc. (Versar) on behalf of Crowley Marine Services (Crowley) and are subject to Versar's standard disclaimer, which is included as Exhibit A.

Site History

The Pacific Dry Dock and Repair Yard I (PDDI), which is located at 1441 Embarcadero in Oakland, California, has been used as a boat repair facility by Crowley and other companies since 1935. PDDI is currently operating on a limited basis. The area surrounding PDDI is occupied by light industrial and commercial facilities. PDDI was previously divided into a western section and an eastern section for the purpose of the preliminary environmental investigation. For the purpose of further investigation and remedial activities, the east and west portions of PDDI will be addressed as a single site. This addendum therefore includes the results of additional soils investigation conducted in the eastern portion of PDDI as well as changes and additions to the Phase II work plan. The location and layout of the site are presented in Figures 1 and 2, Attachment I, respectively.

*Barney Chan, Simultaneously
Levels of Air Quality Sampling
Storage Tank Removal*

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Site Background - Eastern Portion

During March 1992, Versar's investigation identified minor areas of subsurface contamination beneath the eastern portion of the site. The results of the March 1992 investigation of the eastern section are included in Versar's Preliminary Investigation and Evaluation Report dated July 24, 1992. Table 1, Attachment II summarizes the March 1992 laboratory analytical results for Total Petroleum Hydrocarbons (TPH), Oil and Grease Hydrocarbons, and benzene, toluene, ethylbenzene, and xylenes (BTEX) in soil.

Following the preliminary investigation, an abandoned *
underground storage tank (UST) was identified near the eastern corner of PDDI. The origin, operational history, size, type, and contents of the UST were not known. The plan for the proposed investigation and removal of the UST is included in this work plan addendum. Because an Underground Storage Tank Unauthorized Release (LEAK)/Contamination Site Report has been submitted for the 1441 Embarcadero site, a new report is not necessary and will not be submitted.

Between August 17 and 18, 1992, Versar conducted a follow-up investigation of the eastern portion of PDDI. The investigation included collecting a sample of the contents of the abandoned UST, coring an additional 16 boreholes, and collecting soil and ground-water samples for laboratory analysis. Figure 3, Attachment I, shows the locations of the UST and the boreholes on the eastern portion of the site. The laboratory analytical results from the investigation are included in Attachment III.

The UST was found to be approximately three feet in diameter with the top of the tank located at about four feet below ground surface. The UST was about half full of water which exhibited a hydrocarbon sheen. No product other than the hydrocarbon sheen was identified in the tank. Laboratory analysis of a sample of the contents identified water with a salinity of 0.86 (a unitless quantity) that contained concentrations of total petroleum hydrocarbons as diesel (TPH-D), total petroleum hydrocarbons as gasoline (TPH-G), and BTEX. Table 2, Attachment II, summarizes the laboratory analytical results for the sample collected from the tank contents.

} Analyte
in UST

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Laboratory analysis of soil samples collected from the eastern portion of PDDI identified several areas of petroleum hydrocarbon soil contamination. Concentrations of TPH-D exceeding 100 milligrams per kilograms (mg/kg) were identified in samples collected from borings BH20E, BH21E, BH26E, BH27E, BH31E, and BH32E. Analysis for semi-volatile organics identified 0.39 mg/kg of bis(2-ethylhexyl)phthalate in one sample (BH19E-5.0). Laboratory analyses for metals did not identify any concentrations of copper, lead, or mercury greater than the Total Threshold Limit Concentration (TTLC). However, California Waste Extraction Test (WET) analysis identified lead at or slightly above the Soluble Threshold Limit Concentration (STLC) in two samples (BH18E-5.0A and BH32E-5.0). Tables 3 through 7, Attachment II, summarize the laboratory analytical results from the soil sampling.

Ground-water samples were collected from three of the boreholes (BH20E, BH27E, and BH32E) for laboratory analysis. Concentrations of up to 0.32 milligrams per liter (mg/L) of TPH-D and up to 17 mg/L of TPH-G were identified in three samples (BH20E-W, BH27E-W, and BH32E-W). Concentrations of toluene, ethylbenzene, and xylenes up to 0.010 mg/L were identified in sample BH20E-W. Semi-volatile organic compounds [bis(2-ethylhexyl)phthalate and fluorene] were identified in sample BH20E-W. Sample BH32E-W contained bis(2-ethylhexyl)phthalate. Tables 7 and 8, Attachment II, summarize the results of laboratory analysis of the ground-water samples.

Immediate Source Removal

In the Phase II work plan, it was proposed that the areas of identified soil contamination in the western section be excavated and the contaminated soil stockpiled pending determination of a remedial process. However, it has since been determined that the remedial process will be on-site thermal treatment (as further explained below) which will be conducted concurrently with the excavation. Figure 4 shows the approximate areas to be excavated and treated on the western section. The anticipated starting date for immediate source removal activities is September 28, 1992. This date is subject to change based on contractor availability and other site work.

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The excavation process is intended to remove soils containing concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) greater than the practical quantitation reporting limits as stated in the Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites; greater than 10 mg/kg total petroleum hydrocarbons (TPH) as gasoline; 100 mg/kg of TPH as diesel; and 1,000 mg/kg of TPH as oil and grease. These stated limits were approved in a letter from ACHCSA addressed to Mr. George Brooks of Crowley and dated March 16, 1992. A copy of this letter is included as Attachment IV.

*as approved
to reuse
conc of
10 mg/kg
Avg & d
& SD for
706*

In order to confirm that the contamination has been removed to comply with the ACHCSA guidelines stated above, confirmatory samples will be collected from the floor and side walls of each excavation for laboratory analysis. Per the telephone conversation conducted between Mr. Barney Chan of ACHCSA, and Mr. Lawrence Kleinecke of Versar, on March 5, 1992, confirmatory samples will be taken at a rate of one side-wall sample collected per 20 lateral feet, and one floor sample collected per 200 square feet uncovered. The excavation will be extended to a depth at which ground water is actively entering the excavation, or until the above-stated analytical criteria are met. A California EPA certified mobile laboratory will be on site during the soil removal portion of the project to perform the required analyses on a rush basis. The laboratory will be capable of analyzing soil and water for TPH-D and TPH-G by EPA Method 8015, BTEX by EPA Method 8020, and Total Oil and Grease by EPA Method 5520 C/D+F.

Ground water entering the excavation will be evacuated and transported to a licensed facility for recycling. Ground water will be evacuated from the excavation and the excavation allowed to recharge a maximum of two times. Ground-water samples will be collected for laboratory analysis following the second recharge.

Underground Storage Tank Removal

As part of the source removal activities, the UST discovered beneath the eastern section of the site will be removed. Following the UST removal, contaminated soils which may exist beneath the tank will be removed to the extent possible and stockpiled on site for future treatment. The stockpiled soil will be placed on and covered with plastic to help prevent

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*What are these
other area w/
metals contem?*

fugitive emissions of hydrocarbons. Soil samples will be collected from the side walls of the UST excavation and analyzed by the on-site mobile laboratory for TPH-G, TPH-D, BTEX, and total oil and grease as previously described. If ground water is found entering the excavation, it will be evacuated and transported to a licensed facility for recycling as previously described for the source removal activities. If ground water is not identified in the excavation, a soil sample will be collected from the floor and analyzed along with the side wall samples. Prior to initiation of tank removal activities, a Tank Removal Report will be submitted to ACHCSA for approval and a permit obtained from the City of Oakland Fire Department.

Ex-Situ Soil Remediation: Thermal Desorption

Soils removed from the excavations will be treated at the site and returned to the excavations. Prior to backfilling, confirmatory samples will be collected from the side walls of the excavation and from the treated soils to ensure that no soil contamination above regulatory limits remains at the excavation site. Soils removed from the excavation which are not immediately treated will be stored on plastic at the site and covered to prevent fugitive emissions.

The removed soils will be treated using a mobile thermal desorption unit (TDU) operated by Western Thermal Soils Co., which will be brought on-site prior to initiation of excavation activities. The TDU can process approximately 25 tons of soil per hour, and achieves a 98 percent or better destruction rate of hydrocarbon contaminants. The TDU will be placed in the central portion of the site, near the machine shop. The TDU operates by heating the entering soil to temperatures in excess of 700 degrees Fahrenheit. The hot gases released from the soil are then further heated, to temperatures in excess of 1,500 degrees Fahrenheit, ensuring that virtually no hydrocarbons are allowed to escape via the exhaust. A permit from the Bay Area Air Quality Management District was obtained for the TDU; a copy of the permit is included as Attachment V.

Treated soils will be analyzed by a California EPA certified laboratory prior to backfilling into the original excavation. Based on ACHCA standards, soils containing less than 1 mg/kg of TPH as gasoline, 10 mg/kg of TPH as diesel, 100 mg/kg of TPH as

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oil and grease will be considered suitable for backfilling. A composite sample will be collected from each 100 cubic yards of treated soil for laboratory analysis.

Remediation Verification Sampling

As previously stated, it is proposed to return the treated soil to the excavation created by the removal of contaminated soil. Based on the above-referenced standard, soil which contains the following levels of hydrocarbons are suitable for backfilling into the original excavation: 1 mg/kg TPH as gasoline, 10 mg/kg TPH as diesel, and 100 mg/kg TPH as oil and grease.

To verify the success of the TDU in reducing levels of the constituents of concern to acceptable levels, Versar will perform verification end-point sampling in the following manner: collect one composite sample for every 10 cubic yards of soil, prior to and following treatment, for the first 50 cubic yards treated by the TDU and analyze these samples for TPH as gasoline, diesel, BTEX, and total oil and grease. If the backfill criteria have been achieved in the samples, Versar will collect one composite sample for every 100 cubic yards of treated soil and analyze the sample by EPA Method 5520 C+F for Total Oil and Grease, with the assumption that all lighter fuel components will have been removed if the heaviest components (oil and grease) have been lowered to acceptable levels. Versar will continue to collect one composite sample from each 100 cubic yards treated and analyze the samples by EPA Method 5520 C/D+F for Total Oil and Grease until all the soil, an estimated 3,500 cubic yards, has been treated. Treated soils will be stockpiled in 100-cubic yard units prior to completion of laboratory analysis and backfilling.

Response to Items Requiring Clarification

Following the completion of the immediate source removal, a series of ground-water monitoring wells will be installed at the site. The rationale and methodology for the monitoring well installation is explained in detail in the Phase II work plan. Well locations and modifications in accordance with your letter of March 16, 1992 to Mr. George Brooks of Crowley will be discussed in an upcoming workplan addendum.

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In addition, your letter of March 16, 1992 requested the rationale for the absence of analyses of samples from borings BH20, BH21, BH23 through BH26, and BH42 through BH45. These samples were collected from locations proposed for exterior building walls of the new construction planned for the site. Headspace analysis of the samples collected did not identify sufficient concentrations of volatile organic compounds to warrant laboratory analysis.

If you have any questions or comments about the contents of this work plan addendum, or require further information, please do not hesitate to contact our Fair Oaks office at (916) 962-1612.

Sincerely,



Lawrence Kleinecke
Hydrogeologist/Chemist

cc: Mr. George Brooks, Crowley
Mr. Dan Schoenholz, Port of Oakland

EXHIBIT A

DISCLAIMER

The purpose of this work plan addendum is only to inform the client of the environmental conditions as they currently exist at the subject site and the methodology to correct the identified environmental impairment. Versar Inc. does not assume responsibility for the discovery and elimination of hazards that could possibly cause accidents, injuries, or damage. Compliance with submitted recommendations and/or suggestions in no way assures elimination of hazards or the fulfillment of a client's obligation under any local, or federal laws or any modifications or changes thereto. In many cases, federal, or local codes require the prompt reporting to relevant authorities if a release occurs. It is the responsibility of the client to comply with requirements to notify authorities of any conditions that are in violation of the current legal standards.

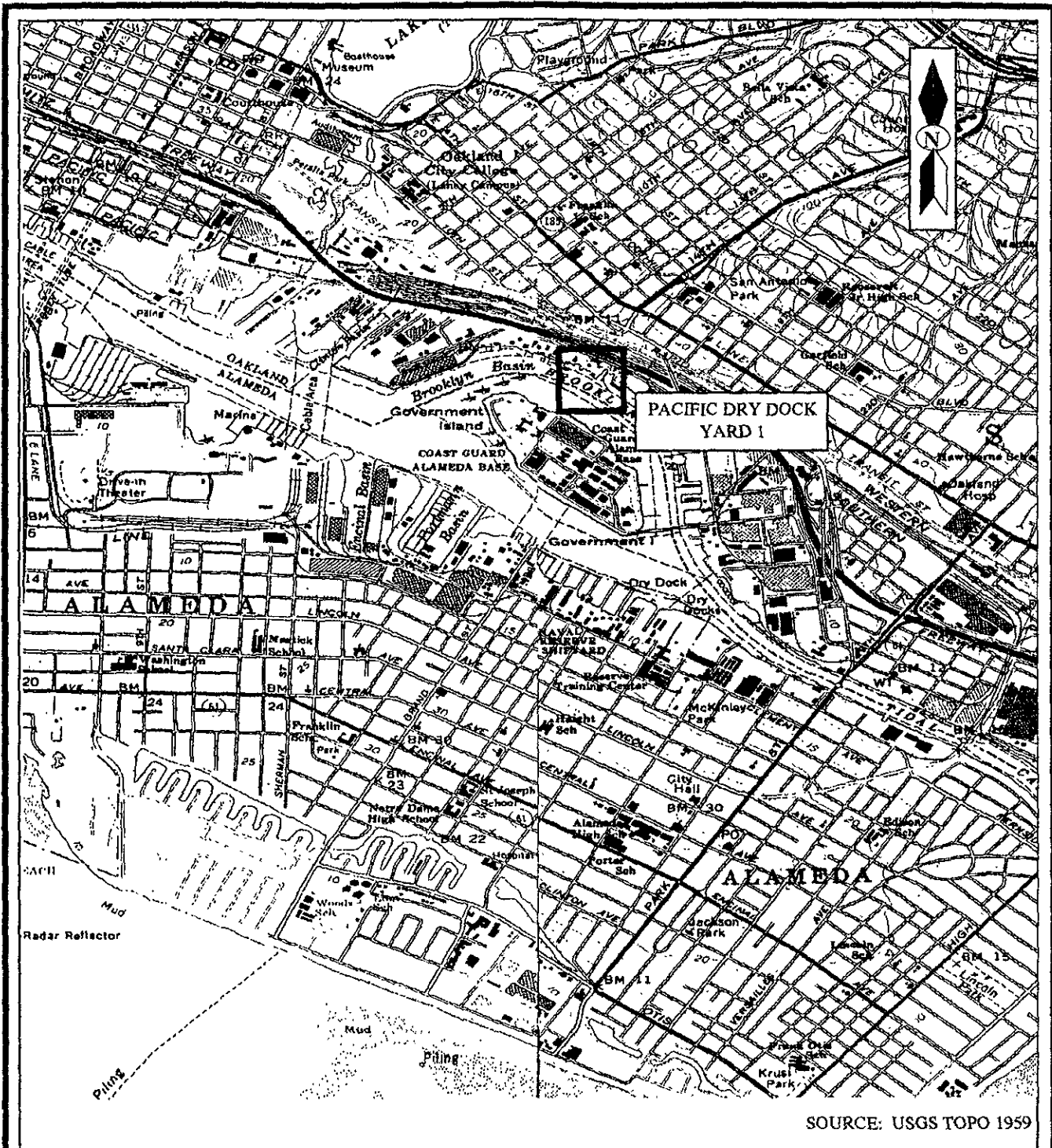
Factual information regarding operations, conditions, and test data was obtained, in part, from the client and have been assumed by Versar to be correct and complete. Since the facts stated in this work plan addendum are subject to professional interpretation, they could result in differing conclusions. In addition, the findings and conclusions contained in this work plan addendum are based on various quantitative and qualitative factors as they existed on or near the date of the investigation. Therefore, if the recommendations made in this work plan addendum are not implemented within a reasonable period of time, there can be no assurances that intervening factors will not arise that will affect the conclusions reached herein.

Versar has prepared this work plan addendum at the request of its client. Versar is responsible for the accuracy of the work plan addendum's contents, subject to what is stated elsewhere in this Disclaimer, but recommends the work plan addendum be used only for the purposes intended by the client and Versar when the work plan addendum was prepared. Versar makes no warranty and assumes no liability with respect to the use of information contained in this work plan addendum. The work plan addendum may be unsuitable for other uses, and Versar assumes no liability for such uses. No changes to its form or content may be made without Versar's express written approval.

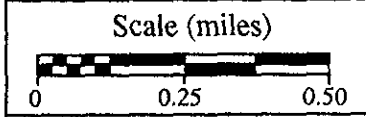
This work plan addendum reflects conditions, operations, and practices as observed during the investigation. Changes or modifications to procedures and/or facilities made after the site visit are not included.

Versar INC. SACRAMENTO

ATTACHMENT I



SOURCE: USGS TOPO 1959



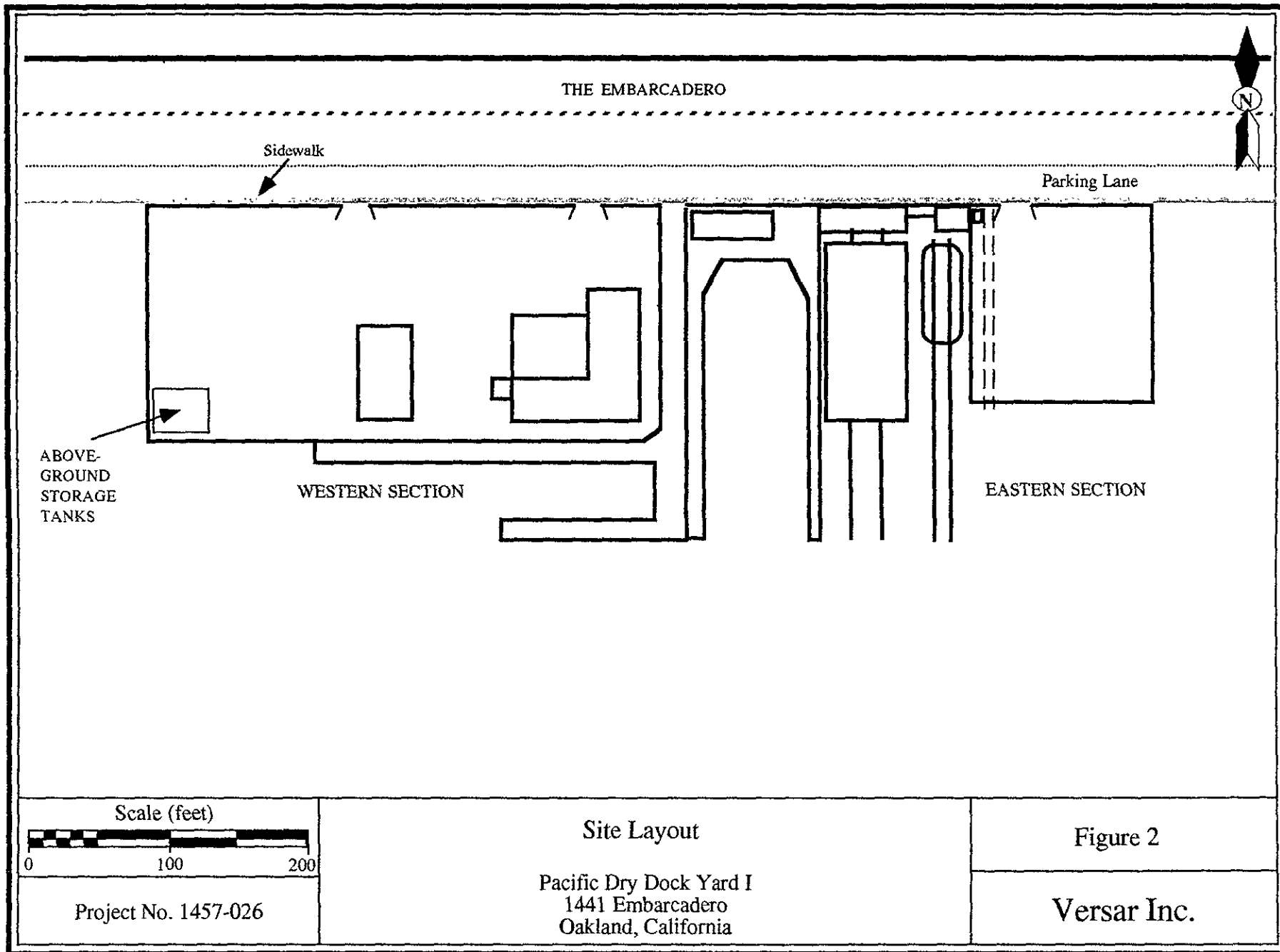
Project No. 1457-026

Site Location

Pacific Dry Dock Yard I
1441 Embarcadero
Oakland, California

Figure 1

Versar Inc.



THE EMBARCADERO

Sidewalk

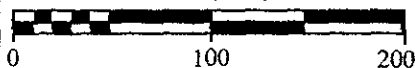
Parking Lane

ABOVE-
GROUND
STORAGE
TANKS

WESTERN SECTION

EASTERN SECTION

Scale (feet)



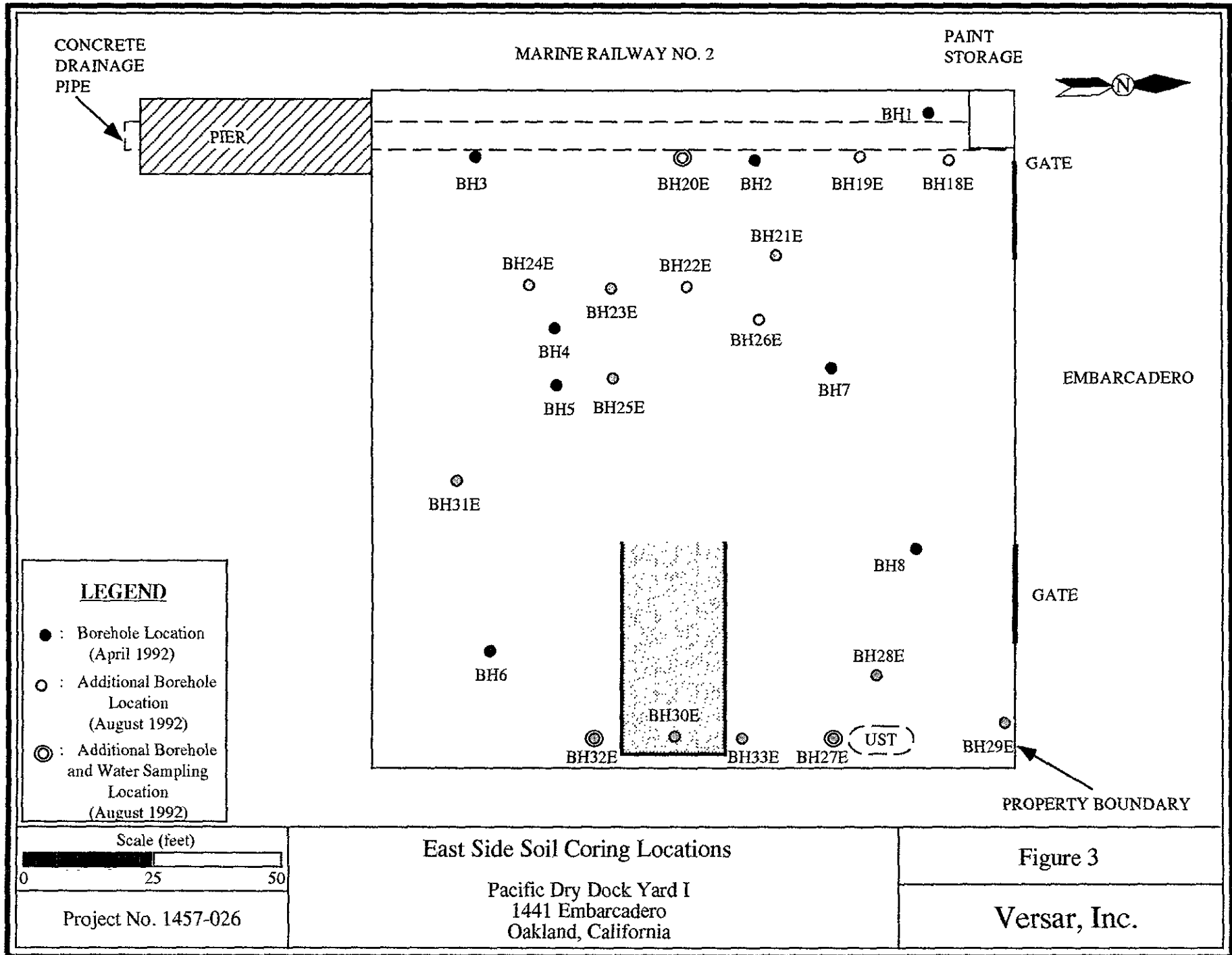
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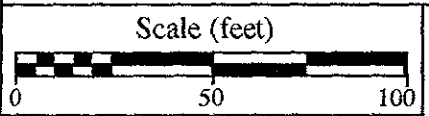
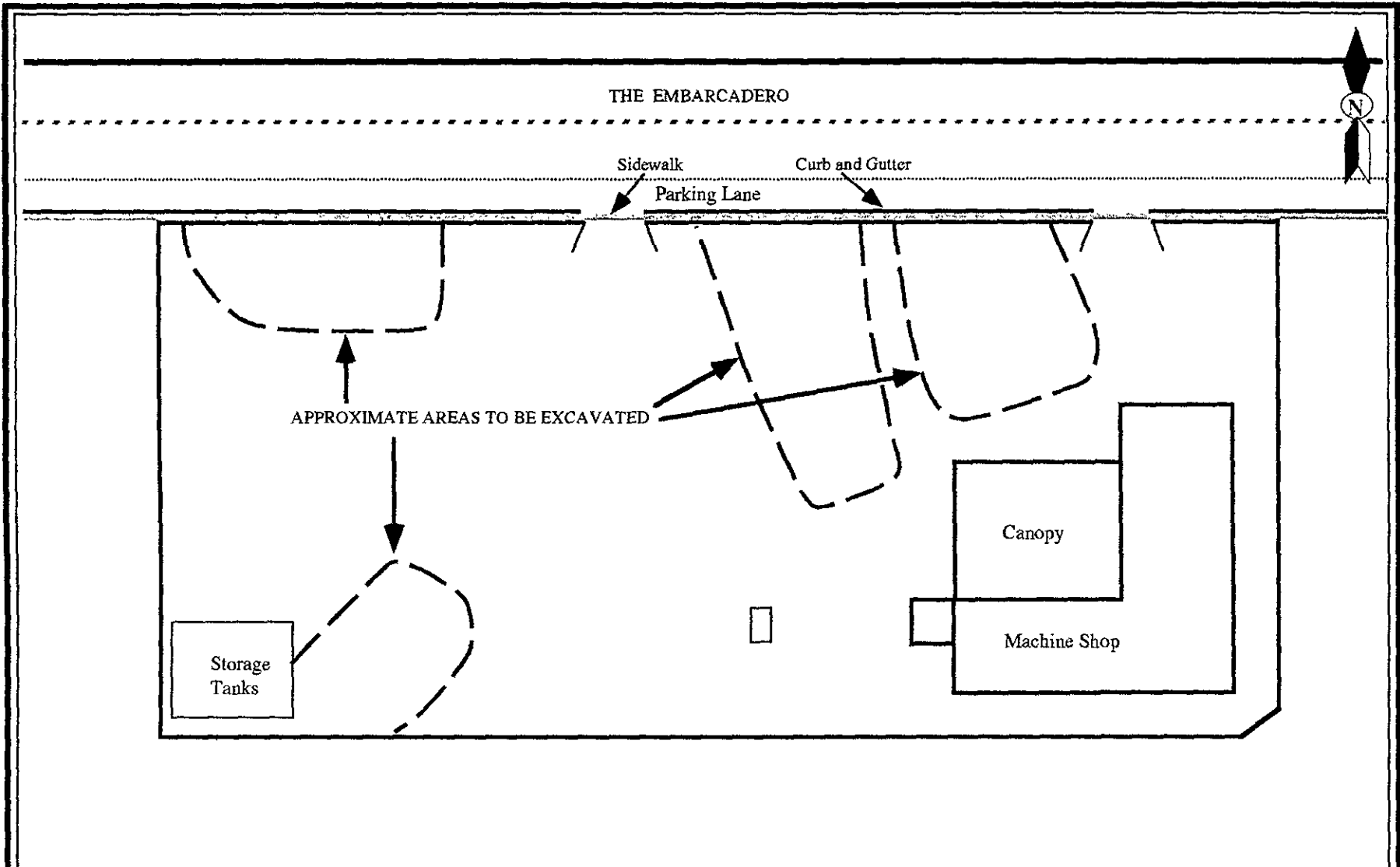
Site Layout

Pacific Dry Dock Yard I
1441 Embarcadero
Oakland, California

Figure 2

Versar Inc.





Project No. 1457-026

Proposed Areas of Excavation-Western Section

Pacific Dry Dock Yard I
1441 Embarcadero
Oakland, California

Figure 4

Versar Inc.

ATTACHMENT II

Table 1
Laboratory Analytical Results for Soils
(Organics)

Pacific Dry Dock and Repair Yard I
Eastern Section
Oakland, California

Sample Number	Sample Depth (feet)	Sample Collection Date	Total Petroleum Hydrocarbons ¹		O&G Hydrocarbons ²	Volatile Organics ³			
			Gasoline (mg/kg) ⁴	Diesel (mg/kg)	Oil and Grease (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
BH1-4.5E	4.0-4.5	03/23/92	2.4	1.6	310	<0.005	<0.005	<0.005	0.099
BH2-7.5E	7.0-7.5	03/23/92	250	2,200	9,100	<0.28	<0.26	<0.3	4.4
BH3-7.5E	7.0-7.5	03/23/92	2.1	100	<50	<0.005	<0.005	<0.005	0.078
BH4-7.5E	7.0-7.5	03/23/92	3.2	6.1	<50	<0.005	<0.005	<0.005	0.089
BH5-5E	4.5-5.0	03/23/92	13	43	270	0.012	0.0066	<0.005	0.380
BH6-10E	9.5-10.0	03/23/92	<0.5	<1.0	<50	<0.005	<0.005	<0.005	<0.015
BH7-7.5E	7.0-7.5	03/23/92	<0.5	<1.0	130	<0.005	<0.005	<0.005	<0.015
BH8-7.5E	7.0-7.5	03/23/92	<0.5	<1.0	<50	<0.005	<0.005	<0.005	<0.015
BH9-7.5E	7.0-7.5	03/23/92	0.620	<1.0	1,100	<0.005	0.0067	0.016	0.094
BH10-5E	4.5-5.0	03/24/92	<0.5	<1.0	<50	<0.005	<0.005	<0.005	<0.015
BH11-50E	4.5-5.0	03/23/92	9.4	3.7	<50	<0.005	<0.005	0.087	0.290
BH12-6E	5.5-6.0	03/24/92	15	140	3,400	<0.0056	0.0091	0.075	0.320
BH13-10E	9.5-10.0	03/24/92	<0.5	<1.0	<50	<0.005	<0.005	<0.005	<0.015
BH14-7.5E	7.0-7.5	03/24/92	<0.5	<1.0	<50	<0.005	<0.005	<0.005	<0.015
BH15-5E	4.5-5.0	03/24/92	<0.5	<1.0	<50	<0.005	<0.005	<0.005	<0.015
BH16-7.5E	7.0-7.5	03/24/92	0.970	8	<50	<0.005	<0.005	<0.005	0.082
BH17-7.5E	7.0-7.5	03/24/92	<0.5	<1.0	<50	<0.005	<0.005	<0.005	<0.015

¹ California DHS/LUFT Manual Method

² EPA Method 5220EF

³ EPA Method 8020

⁴ Milligrams per kilogram

Table 2

Laboratory Analytical Results from Underground Storage Tank Sampling

Pacific Dry Dock and Repair Yard I
 Eastern Section
 Oakland, California

*Contents
 of
 UST - mostly
 H₂O*

Sample Number	Sample Collection Date	Total Petroleum Hydrocarbons ¹			Salinity	Volatile Organics ²			
		Gasoline (mg/L) ³	Diesel (mg/L)			Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
UST-E	08/18/92	4,700	2,000		0.86	270	1,100	64	300

¹ California DHS/LUFT Manual Method

² EPA Method 602

³ Milligrams per liter

Table 3
Laboratory Analytical Results for Soils
(Organics)

Pacific Dry Dock and Repair Yard 1
Eastern Section
Oakland, California

Sample Number	Sample Depth (feet)	Sample Collection Date	Total Petroleum Hydrocarbons ¹		O&G Hydrocarbons ²	Volatile Organics ³			
			Gasoline (mg/kg) ⁴	Diesel (mg/kg)	Oil and Grease (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
BH18E-5.0A	4.5-5.0	08/17/92	4.3	11.0	<5.0	0.0051	<0.005 ⁴	<0.005	<0.015
BH19E-5.0	4.5-5.0	08/17/92	<0.5	8.4	120	<0.005	<0.005	<0.005	<0.015
BH20E-7.5	7.0-7.5	08/17/92	<0.5	350	<50	<0.005	<0.005	<0.005	0.017
BH21E-2.5	2.0-2.5	08/17/92	<0.5	530	120	<0.005	<0.005	<0.005	<0.015
BH22E-7.5	7.0-7.5	08/17/92	0.9	16	58	<0.005	<0.005	<0.005	<0.015
BH24E-5.0	4.5-5.0	08/17/92	<0.5	9.2	<50	<0.005	<0.005	<0.005	0.016
BH25E-5.0	4.5-5.0	08/17/92	<0.5	<1.0	<50	<0.005	<0.005	0.018	<0.015
BH26E-7.5	7.0-7.5	08/17/92	4.7	180	280	<0.005	<0.005	<0.005	<0.015
BH27E-5.0	4.5-5.0	08/17/92	2.4	2.5	98	<0.005	<0.005	<0.005	<0.015
BH28E-5.0	4.5-5.0	08/17/92	<0.5	<1.0	<50	<0.005	<0.005	<0.005	<0.015
BH29E-2.5	2.0-2.5	08/17/92	<0.5	<1.0	<50	<0.005	0.0056	<0.005	<0.015
BH29E-5.0	4.5-5.0	08/17/92	<0.5	<1.0	<50	<0.005	<0.005	<0.005	<0.015
BH30E-5.0	4.5-5.0	08/18/92	<0.5	<1.0	<50	<0.005	<0.005	<0.005	<0.015
BH31E-7.5	7.0-7.5	08/18/92	2.8	2,400	380	<0.005	<0.005	0.0095	0.082
BH32E-5.0	4.5-5.0	08/18/92	0.88	160	550	<0.005	<0.005	<0.005	<0.015
BH33E-5.0	4.5-5.0	08/18/92	<0.5	<1.0	<50	<0.005	<0.005	<0.005	<0.015
Method Blank		08/21/92	<0.5	<1.0	<50	<0.005	0.0095	<0.005	<0.015
Method Blank		08/20/92	<0.5	<1.0	<50	0.0059	0.0074	<0.005	<0.015

¹ California DHS/LUFT Manual Method

² EPA Method 5220CF

³ EPA Method 8020 (equivalent to parts per million)

⁴ Milligrams per kilogram

Table 4

Laboratory Analytical Results for Soils
(Semi-Volatile Organics)¹

Pacific Dry Dock and Repair Yard I
Eastern Section
Oakland, California

Sample Number	Sample Depth (feet)	Sample Collection Date	BIS(2-ethylexyl) Phthalate (mg/kg) ²
BH19E-5.0	4.0-4.5	08/17/92	0.390

¹ EPA Method 8270

² Milligrams per kilogram

Table 5
 Laboratory Analytical Results for Soils
 (Total Metals)

Pacific Dry Dock and Repair Yard 1
 Eastern Section
 Oakland, California

Analyte	Sample Number	BH18E-5.0A	BH24E-5.0	BH25E-5.0	BH30E-5.0	BH32E-5.0	BH33E-5.0
	Depth (feet)	4.5-5.0	4.5-5.0	4.5-5.0	4.5-5.0	4.5-5.0	4.5-5.0
	Collection Date	08/17/92	08/17/92	08/17/92	08/18/92	08/18/92	08/18/92
Copper		520	38	22	27	310	17
Lead		120	17	5.2	5.6	760	26
Mercury		4.5	0.310	0.099	0.110	0.730	0.091

Notes: All results reported in milligrams per kilogram.
 None of the results listed exceed Total Threshold Limit Concentration (TTLIC).

Table 6

Laboratory Analytical Results for Soils
(California Waste Extraction Test)

Pacific Dry Dock and Repair Yard I
Eastern Section
Oakland, California

Analyte	Sample Number	BH18E-5.0A	BH24E-5.0	BH25E-5.0	BH30E-5.0	BH32E-5.0	BH33E-5.0
	Depth (feet)	4.5-5.0	4.5-5.0	4.5-5.0	4.5-5.0	4.5-5.0	4.5-5.0
	Collection Date	08/17/92	08/17/92	08/17/92	08/18/92	08/18/92	08/18/92
Copper		0.4	1.1	0.540	0.560	0.940	0.350
Lead		5.6	0.34	<0.10	0.150	5.0	0.40
Mercury		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

Note: All results reported in milligrams per liter

¹ The results listed in bold type meet or exceed Soluble Threshold Limit Concentration (STLC)

Table 7
 Laboratory Analytical Results for Water
 (Organics)
 Pacific Dry Dock and Repair Yard I
 Eastern Section
 Oakland, California

Sample Number	Sample Collection Date	Total Petroleum Hydrocarbons ¹		O&G Hydrocarbons ²	Volatile Organics ³			
		Gasoline (mg/L) ⁴	Diesel (mg/L)	Oil and Grease (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
BH20E-W	08/18/92	0.260	17	19	<0.0009	0.00092	0.0022	0.010
BH27E-W	08/18/92	0.320	16	5.5	<0.0005	<0.0005	<0.0005	<0.0015
BH32E-W	08/18/92	<0.05	2.7	12	<0.0005	<0.0005	<0.0005	<0.0015
Method Blank	08/18/92	<0.05	<0.05	<1.0	<0.0005	0.00059	<0.0005	<0.0015

NEAR
LST

¹ California DHS/LUFT Manual Method

² EPA Method 5220EF

³ EPA Method 602

⁴ Milligrams per liter

Table 8
 Laboratory Analytical Results for Water
 (Semi-Volatile Organics)¹
 Pacific Dry Dock and Repair Yard I
 Eastern Section
 Oakland, California

Sample Number	Sample Depth (feet)	Sample Collection Date	Bis(2-ethylhexyl) Phthalate (mg/L) ²
BH20E-W	08/18/92	0.033	0.018
BH32E-W	08/18/92	0.012	<0.010

¹ EPA Method 8270

² Milligrams per liter

Versar INC. SACRAMENTO

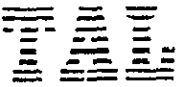
ATTACHMENT III

Trace Analysis Laboratory, Inc.

3423 Investment Boulevard, #8 • Hayward, California 94545

Telephone (510) 783-6960

Facsimile (510) 783-1512



August 20, 1992

SEARCHED
SERIALIZED
INDEXED
FILED

Ms. Yvonne Lembi
Versar, Inc.
5330 Primrose Drive, Suite 228
Fair Oaks, California 95628

Dear Ms. Lembi:

Trace Analysis Laboratory received seventeen soil and four water samples on August 18, 1992 for your Project No. 1457.027, PDDI East (our custody log number 2413).

These samples were analyzed according to your request. Our analytical report, the completed chain of custody form, and our analytical methodologies are enclosed for your review.

Trace Analysis Laboratory is certified under the California Environmental Laboratory Accreditation Program. Our certification number is 1199.

If you should have any questions or require additional information, please call me.

Sincerely yours,

A handwritten signature in cursive script, appearing to read 'Jennifer Pekol'.

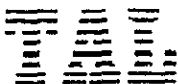
Jennifer Pekol
Project Specialist

Enclosures

Trace Analysis Laboratory, Inc.

3423 Investment Boulevard, #8 • Hayward, California 94545

Telephone (510) 783-6960
Facsimile (510) 783-1512



LOG NUMBER: 2413
DATE SAMPLED: 08/17/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/19/92
DATE ANALYZED: 08/20/92
DATE REPORTED: 08/20/92

CUSTOMER: Versar, Inc.
REQUESTER: Yvonne Lembi
PROJECT: No. 1457-027, PDDI-East

Sample Type: Soil

Method and Constituent:	Units	BH27E-5.0		BH28E-5.0		BH29E-2.5	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit

DHS Method:

Total Petroleum Hydrocarbons as Diesel	ug/kg	2,500	1,000	ND	1,000	ND	1,000
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Method and Constituent:	Units	BH29E-5.0		Method Blank	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit

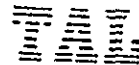
DHS Method:

Total Petroleum Hydrocarbons as Diesel	ug/kg	ND	1,000	ND	1,000
--	-------	----	-------	----	-------

QC Summary:

% Recovery: 164
% RPD: 28

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413
 DATE SAMPLED: 08/17/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/19/92
 DATE ANALYZED: 08/20/92
 DATE REPORTED: 08/20/92
 PAGE: Three

Sample Type: Soil

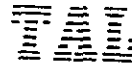
Method and Constituent:	Units	BH27E-5.0		BH28E-5.0		BH29E-2.5	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
DHS Method:							
Total Petroleum Hydro- carbons as Gasoline	ug/kg	2,400	500	ND	500	ND	500
Modified EPA Method 8020 for:							
Benzene	ug/kg	ND	5.0	ND	5.0	ND	5.0
Toluene	ug/kg	ND	5.0	ND	5.0	5.6	5.0
Ethylbenzene	ug/kg	ND	5.0	ND	5.0	ND	5.0
Xylenes	ug/kg	ND	15	ND	15	ND	15

Method and Constituent:	Units	BH29E-5.0		Method Blank	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
DHS Method:					
Total Petroleum Hydro- carbons as Gasoline	ug/kg	ND	500	ND	500
Modified EPA Method 8020 for:					
Benzene	ug/kg	ND	5.0	5.9	5.0
Toluene	ug/kg	ND	5.0	7.4	5.0
Ethylbenzene	ug/kg	ND	5.0	ND	5.0
Xylenes	ug/kg	ND	15	ND	15

QC Summary:

% Recovery: 75
 % RPD: 2.0

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413
DATE SAMPLED: 08/17/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/19/92
DATE ANALYZED: 08/20/92
DATE REPORTED: 08/20/92
PAGE: Five

Sample Type: Soil

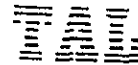
Method and Constituent:	Units	BH27E-5.0		BH28E-5.0		BH29E-2.5	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
Standard Method 5520 EF Hydrocarbons:							
Oil and Grease	ug/kg	98,000	50,000	ND	50,000	ND	50,000

Method and Constituent:	Units	BH29E-5.0		Method Blank	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
Standard Method 5520 EF Hydrocarbons:					
Oil and Grease.	ug/kg	ND	50,000	ND	50,000

QC Summary:

% Recovery: 76
% RPD: 17

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413
 DATE SAMPLED: 08/18/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/18/92
 DATE ANALYZED: 08/20/92
 DATE REPORTED: 08/20/92
 PAGE: Two

Sample Type: Water

Method and Constituent:	Units	BH27E-W		UST-E		Method Blank	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
DHS Method:							
Total Petroleum Hydro- carbons as Diesel	ug/l	16,000	50	2,000,000	19,000	ND	50

QC Summary:

% Recovery: 132
 % RPD: 5.3

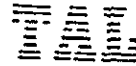
Concentrations reported as ND were not detected at or above the reporting limit.
 These samples contain compounds eluting earlier than the diesel standard.



CHAIN OF CUSTODY RECORD

CGFT Soil
for Yvonne
8/18/92
Page 1 of 2

PROJECT NO.		PROJECT NAME					PARAMETERS							INDUSTRIAL HYGIENE SAMPLE	Y		
1457-027		PDD I - East													N		
SAMPLERS: (Signature) Yvonne Lembi Rick Strider					(Printed) YVONNE LEMBI RICK STRIDER												
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	PARAMETERS							2413			
							TPH-G	BTEX	TPH-D	Oil/Grease (S20)	BZ70	Cu/Pb/Hg/Alc	Salinity				
BH18E-5.0A	8/17/92	1021		X	soil	1	X	X	X	X		X					
BH19E-5.0		1010		X	soil	1	X	X	X	X	X						
BH20E-7.5		1105		X		1	X	X	X	X							
BH21E-2.5		1035		X		1	X	X	X	X							
BH22E-7.5		1115		X		1	X	X	X	X							
BH23E-2.5		1145		X		1	X	X	X	X							
BH23E-7.5		1155		X		1	X	X	X	X					Hold		
BH24E-5.0		1300		X		1	X	X	X	X		X					
BH25E-5.0		1320		X		1	X	X	X	X		X					
BH26E-7.5		1345		X		1	X	X	X	X							
BH27E-5.0		1425		X		1	X	X	X	X					* RUSH - 48 hr TAT		
BH28E-5.0	✓	1450		X	✓	1	X	X	X	X					* RUSH - 48 TAT		
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Relinquished by: (Signature)		Date / Time		Received by: (Signature)					
(Printed)					(Printed)			Yvonne Lembi		8/18/92 / 16:50		(Printed)					
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)			Date / Time		Remarks							
(Printed)					Lucis D. Pius			8/18/92 / 16:50		CALL Yvonne Lembi or Larry Kleinecke 916 962 1612 - VERSAR pick-up of soils = 1-37 ea. y-9 ref.							



LOG NUMBER: 2413
DATE SAMPLED: 08/18/92
DATE RECEIVED: 08/18/92
DATE ANALYZED: 08/19/92
DATE REPORTED: 08/20/92
PAGE: Four

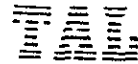
Sample Type: Water

Method and Constituent:	Units	BH27E-W		UST-E		Method Blank	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
DHS Method:							
Total Petroleum Hydro- carbons as Gasoline	ug/l	320	50	4,700,000	1,900	ND	50
Modified EPA Method 8020 for:							
Benzene	ug/l	ND	0.50	270,000	900	ND	0.50
Toluene	ug/l	ND	0.50	1,100,000	950	ND	0.50
Ethylbenzene	ug/l	ND	0.50	64,000	1,400	ND	0.50
Xylenes	ug/l	ND	1.5	300,000	3,600	ND	1.5

QC Summary:

% Recovery: 92
% RPD: 23

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413
DATE SAMPLED: 08/18/92
DATE RECEIVED: 08/18/92
DATE ANALYZED: 08/20/92
DATE REPORTED: 08/20/92
PAGE: Seven

Sample Type: Water

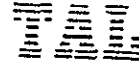
Method and Constituent:	Units	UST-E		Method Blank	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
Standard Method 2520B:					
Salinity	unitless	0.86	0.010	ND	0.010

QC Summary:

% Recovery: 95
% RPD: 0.0

Concentrations reported as ND were not detected at or above the reporting limit.

Louis W. DuPuis
Quality Assurance/Quality Control Manager



LOG NUMBER: 2413
DATE SAMPLED: 08/18/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/18/92
DATE ANALYZED: 08/20/92
DATE REPORTED: 08/20/92
PAGE: Six

Sample Type: Water

<u>Method and Constituent:</u>	<u>Units</u>	<u>BH27E-W</u>		<u>Method Blank</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>
Standard Method 5520 CF Hydrocarbons:					
Oil and Grease	ug/l	5,500	2,000	ND	1,000

QC Summary:

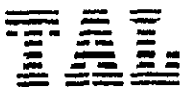
% Recovery: 94
% RPD: 9.6

Concentrations reported as ND were not detected at or above the reporting limit.

Trace Analysis Laboratory, Inc.

3423 Investment Boulevard, #8 • Hayward, California 94545

Telephone (510) 783-6960
Facsimile (510) 783-1512



September 9, 1992

Ms. Yvonne Lembi
Versar, Inc.
5330 Primrose Drive, Suite 228
Fair Oaks, California 95628

Dear Ms. Lembi:

Trace Analysis Laboratory received seventeen soil samples and four water samples on August 18, 1992 for your Project No. 1457-027, PDDI-East (our custody log number 2413A and 2413C).

These samples were analyzed according to your chain of custody and your August 21, 1992 request. Our analytical report, the completed chain of custody form, and our analytical methodologies are enclosed for your review.

Trace Analysis Laboratory is certified under the California Environmental Laboratory Accreditation Program. Our certification number is 1199.

If you should have any questions or require additional information, please call me.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'Jennifer Peko', written in a cursive style.

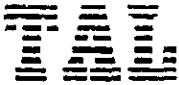
Jennifer Peko
Project Specialist

Enclosures

Trace Analysis Laboratory, Inc.

3423 Investment Boulevard, #8 • Hayward, California 94545

Telephone (510) 783-6960
Facsimile (510) 783-1512



LOG NUMBER: 2413A and 2413C
DATE SAMPLED: 08/17/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/24/92
DATE ANALYZED: 08/27/92
DATE REPORTED: 09/03/92 and 09/09/92

CUSTOMER: Versar, Inc.
REQUESTER: Yvonne Lembi
PROJECT: No. 1457-027, PDDI-East

Sample Type: Soil

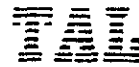
Method and Constituent:	Units	BH18E-5.0A		BH19E-5.0		BH20E-7.5	
		Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Diesel	ug/kg	11,000	1,000	8,400	1,000	350,000	1,000

Method and Constituent:	Units	BH21E-2.5		BH22E-7.5		BH23E-7.5	
		Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Diesel	ug/kg	530,000	1,000	16,000	1,000	21,000	1,000

Method and Constituent:	Units	BH24E-5.0		BH25E-5.0		BH26E-7.5	
		Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Diesel	ug/kg	9,200	1,000	ND	1,000	180,000	1,000

Concentrations reported as ND were not detected at or above the reporting limit.

Samples BH18E-5.0A, BH19E-5.0, BH22E-7.5 and BH24E-5.0 contain compounds eluting later than our diesel standard.



LOG NUMBER: 2413A
 DATE SAMPLED: 08/18/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/24/92
 DATE ANALYZED: 08/27/92 and 08/28/92
 DATE REPORTED: 09/03/92
 PAGE: Two

Sample Type: Soil

Method and Constituent:	Units	BH30E-5.0		BH31E-7.5		BH32E-5.0	
		Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Diesel	ug/kg	ND	1,000	2,400,000	9,000	160,000	1,000

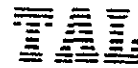
Method and Constituent:	Units	BH33E-5.0		Method Blank	
		Concentration	Reporting Limit	Concentration	Reporting Limit
DHS Method:					
Total Petroleum Hydrocarbons as Diesel	ug/kg	ND	1,000	ND	1,000

QC Summary:

% Recovery: 72
 % RPD: 19

Concentrations reported as ND were not detected at or above the reporting limit.

Samples BH31E-7.5 and BH32E-5.0 contain compounds eluting later than our diesel standard.



LOG NUMBER: 2413A
DATE SAMPLED: 08/18/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/27/92
DATE ANALYZED: 09/01/92
DATE REPORTED: 09/03/92
PAGE: Three

Sample Type: Water

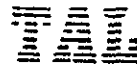
Method and Constituent:	Units	BH20E-W		BH32E-W		Method Blank	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
DHS Method:							
Total Petroleum Hydro- carbons as Diesel	ug/l	17,000	120	2,700	50	ND	50

QC Summary:

% Recovery: 73
% RPD: 0.2

Concentrations reported as ND were not detected at or above the reporting limit.

Sample BH32E-W contain compounds eluting later than the diesel standard.



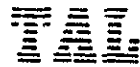
LOG NUMBER: 2413A and 2413C
 DATE SAMPLED: 08/17/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/20/92 and 08/21/92
 DATE ANALYZED: 08/21/92 and 08/25/92
 DATE REPORTED: 09/03/92 and 09/09/92
 PAGE: Four

Sample Type: Soil

<u>Method and Constituent:</u>	<u>Units</u>	<u>BH18E-5.0A</u>		<u>BH19E-5.0</u>		<u>BH20E-7.5</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/kg	4,300	500	ND	500	ND	500
Modified EPA Method 8020 for:							
Benzene	ug/kg	5.1	5.0	ND	5.0	ND	5.0
Toluene	ug/kg	ND	5.4	ND	5.0	ND	5.0
Ethylbenzene	ug/kg	ND	5.0	ND	5.0	ND	5.0
Xylenes	ug/kg	ND	15	ND	15	17	15

<u>Method and Constituent:</u>	<u>Units</u>	<u>BH21E-2.5</u>		<u>BH22E-7.5</u>		<u>BH23E-7.5</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/kg	ND	500	900	500	ND	500
Modified EPA Method 8020 for:							
Benzene	ug/kg	ND	5.0	ND	5.0	ND	5.0
Toluene	ug/kg	ND	5.0	ND	5.0	ND	5.0
Ethylbenzene	ug/kg	ND	5.0	ND	5.0	ND	5.0
Xylenes	ug/kg	ND	15	ND	15	ND	15

Concentrations reported as ND were not detected at or above the reporting limit.



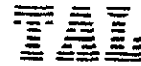
LOG NUMBER: 2413A
 DATE SAMPLED: 08/17/92 and 08/18/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/20/92
 DATE ANALYZED: 08/21/92 and 08/22/92
 DATE REPORTED: 09/03/92
 PAGE: Five

Sample Type: Soil

<u>Method and Constituent:</u>	<u>Units</u>	<u>BH24E-5.0</u>		<u>BH25E-5.0</u>		<u>BH26E-7.5</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/kg	ND	500	ND	500	4,700	500
Modified EPA Method 8020 for:							
Benzene	ug/kg	ND	5.0	ND	5.0	ND	5.0
Toluene	ug/kg	ND	5.0	ND	5.0	ND	5.0
Ethylbenzene	ug/kg	ND	5.0	18	5.0	ND	5.0
Xylenes	ug/kg	16	15	ND	15	ND	15

<u>Method and Constituent:</u>	<u>Units</u>	<u>BH30E-5.0</u>		<u>BH31E-7.5</u>		<u>BH32E-5.0</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/kg	ND	500	2,800	500	880	500
Modified EPA Method 8020 for:							
Benzene	ug/kg	ND	5.0	ND	5.0	5.6	5.0
Toluene	ug/kg	ND	5.0	ND	5.4	ND	5.4
Ethylbenzene	ug/kg	ND	5.0	9.5	5.0	ND	5.0
Xylenes	ug/kg	ND	15	ND	15	ND	15

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413A
 DATE SAMPLED: 08/18/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/20/92
 DATE ANALYZED: 08/22/92
 DATE REPORTED: 09/03/92
 PAGE: Six

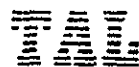
Sample Type: Soil

Method and Constituent:	Units	BH33E-5.0		Method Blank	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
DHS Method:					
Total Petroleum Hydro- carbons as Gasoline	ug/kg	ND	500	ND	500
Modified EPA Method 8020 for:					
Benzene	ug/kg	ND	5.0	ND	5.0
Toluene	ug/kg	ND	5.0	9.5	5.0
Ethylbenzene	ug/kg	ND	5.0	ND	5.0
Xylenes	ug/kg	ND	15	ND	15

QC Summary:

% Recovery: 122 and 118
 % RPD: 12 and 12

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413A
DATE SAMPLED: 08/18/92
DATE RECEIVED: 08/18/92
DATE ANALYZED: 08/20/92
DATE REPORTED: 09/03/92
PAGE: Seven

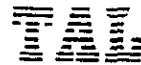
Sample Type: Water

<u>Method and Constituent:</u>	<u>Units</u>	<u>BH20E-W</u>		<u>BH32E-W</u>		<u>Method Blank</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/l	260	50	ND	50	ND	50
Modified EPA Method 8020 for:							
Benzene	ug/l	ND	0.90	ND	0.50	ND	0.50
Toluene	ug/l	0.92	0.95	ND	0.50	0.59	0.50
Ethylbenzene	ug/l	2.2	1.4	ND	0.50	ND	0.50
Xylenes	ug/l	10	3.6	ND	1.5	ND	1.5

QC Summary:

% Recovery: 94
% RPD: 8.2

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413A and 2413C
 DATE SAMPLED: 08/17/92
 DATE RECEIVED: 08/18/92
 DATE ANALYZED: 08/27/92
 DATE EXTRACTED: 08/21/92
 DATE REPORTED: 09/03/92 and 09/09/92
 PAGE: Eight

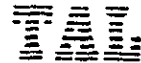
Sample Type: Soil

Method and Constituent:	Units	BH18E-5.0A		BH19E-5.0		BH20E-7.5	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
Standard Method 5520 EF Hydrocarbons:							
Oil and Grease	ug/kg	ND	50,000	120,000	50,000	ND	50,000

Method and Constituent:	Units	BH21E-2.5		BH22E-7.5		BH23E-7.5	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
Standard Method 5520 EF Hydrocarbons:							
Oil and Grease	ug/kg	120,000	50,000	58,000	50,000	ND	50,000

Method and Constituent:	Units	BH24E-5.0		BH25E-5.0		BH26E-7.5	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
Standard Method 5520 EF Hydrocarbons:							
Oil and Grease	ug/kg	ND	50,000	ND	50,000	280,000	50,000

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413A
DATE SAMPLED: 08/18/92
DATE RECEIVED: 08/18/92
DATE ANALYZED: 08/27/92
DATE EXTRACTED: 08/21/92
DATE REPORTED: 09/03/92
PAGE: Nine

Sample Type: Soil

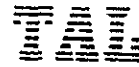
<u>Method and Constituent:</u>	<u>Units</u>	<u>BH30E-5.0</u>		<u>BH31E-7.5</u>		<u>BH32E-5.0</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>
Standard Method 5520 EF Hydrocarbons:							
Oil and Grease	ug/kg	ND	50,000	380,000	50,000	550,000	50,000

<u>Method and Constituent:</u>	<u>Units</u>	<u>BH33E-5.0</u>		<u>Method Blank</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>
Standard Method 5520 EF Hydrocarbons:					
Oil and Grease	ug/kg	ND	50,000	ND	50,000

QC Summary:

% Recovery: 66
% RPD: 6.1

Concentrations reported as ND were not detected at or above the reporting limit.



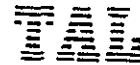
LOG NUMBER: 2413A
 DATE SAMPLED: 08/18/92
 DATE RECEIVED: 08/18/92
 DATE ANALYZED: 09/02/92
 DATE EXTRACTED: 09/02/92
 DATE REPORTED: 09/03/92
 PAGE: Ten

Sample Type: Water

Method and Constituent:	Units	BH20E-W		BH32E-W	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
Standard Method 5520 CF Hydrocarbons:					
Oil and Grease	ug/l	19,000	1,000	12,000	1,000

QC Summary:

% Recovery: 92
 % RPD: 3

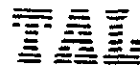


LOG NUMBER: 2413A
DATE SAMPLED: 08/17/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/20/92
DATE ANALYZED: 08/22/92
DATE REPORTED: 09/03/92
PAGE: Eleven

Sample Type: Soil

Method and Constituent:	Units	BH19E-5.0		BH22E-7.5		BH26E-7.5	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 8270:							
N-Nitrosodimethylamine	ug/kg	ND	330	ND	330	ND	330
Phenol	ug/kg	ND	330	ND	330	ND	330
Bis (-2-Chloroethyl) ether	ug/kg	ND	330	ND	330	ND	330
2-Chlorophenol	ug/kg	ND	330	ND	330	ND	330
1,3-Dichlorobenzene	ug/kg	ND	330	ND	330	ND	330
1,4-Dichlorobenzene	ug/kg	ND	330	ND	330	ND	330
1,2-Dichlorobenzene	ug/kg	ND	330	ND	330	ND	330
N-Nitroso-Di-N- Propylamine	ug/kg	ND	330	ND	330	ND	330
Hexachloroethane	ug/kg	ND	330	ND	330	ND	330
Nitrobenzene	ug/kg	ND	330	ND	330	ND	330
Isophorone	ug/kg	ND	330	ND	330	ND	330
2-Nitrophenol	ug/kg	ND	330	ND	330	ND	330
2,4-Dimethylphenol	ug/kg	ND	330	ND	330	ND	330
Bis(-2-Chloroethoxy) Methane	ug/kg	ND	330	ND	330	ND	330
2,4-Dichlorophenol	ug/kg	ND	330	ND	330	ND	330
1,2,4-Trichlorobenzene	ug/kg	ND	330	ND	330	ND	330
Naphthalene	ug/kg	ND	330	ND	330	ND	330

Concentrations reported as ND were not detected at or above the reporting limit.

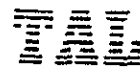


LOG NUMBER: 2413A
DATE SAMPLED: 08/17/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/20/92
DATE ANALYZED: 08/22/92
DATE REPORTED: 09/03/92
PAGE: Twelve

Sample Type: Soil

Method and Constituent:	Units	BH19E-5.0		BH22E-7.5		BH26E-7.5	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 8270 (Continued):							
Hexachlorobutadiene	ug/kg	ND	330	ND	330	ND	330
4-Chloro-3-Methyl- phenol	ug/kg	ND	330	ND	330	ND	330
Hexachlorocyclo- pentadiene	ug/kg	ND	330	ND	330	ND	330
2,4,6-Trichlorophenol	ug/kg	ND	330	ND	330	ND	330
2-Chloronaphthalene	ug/kg	ND	330	ND	330	ND	330
Dimethyl Phthalate	ug/kg	ND	330	ND	330	ND	330
Acenaphthylene	ug/kg	ND	330	ND	330	ND	330
Acenaphthene	ug/kg	ND	330	ND	330	ND	330
2,4-Dinitrophenol	ug/kg	ND	330	ND	330	ND	330
4-Nitrophenol	ug/kg	ND	330	ND	330	ND	330
2,4-Dinitrotoluene	ug/kg	ND	330	ND	330	ND	330
2,6-Dinitrotoluene	ug/kg	ND	330	ND	330	ND	330
Diethylphthalate	ug/kg	ND	330	ND	330	ND	330
4-Chlorophenylphenyl Ether	ug/kg	ND	330	ND	330	ND	330
Fluorene	ug/kg	ND	330	ND	330	ND	330
N-Nitrosodiphenylamine	ug/kg	ND	330	ND	330	ND	330
4-Bromophenylphenyl Ether	ug/kg	ND	330	ND	330	ND	330
Hexachlorobenzene	ug/kg	ND	330	ND	330	ND	330
Pentachlorophenol	ug/kg	ND	330	ND	330	ND	330
Phenanthrene	ug/kg	ND	330	ND	330	ND	330
Anthracene	ug/kg	ND	330	ND	330	ND	330

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413A
 DATE SAMPLED: 08/17/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/20/92
 DATE ANALYZED: 08/22/92
 DATE REPORTED: 09/03/92
 PAGE: Thirteen

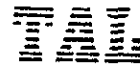
Sample Type: Soil

Method and Constituent:	Units	BH19E-5.0		BH22E-7.5		BH26E-7.5	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 8270 (Continued):							
Di-N-Butylphthalate	ug/kg	ND	330	ND	330	ND	330
Fluoranthene	ug/kg	ND	330	ND	330	ND	330
Benzidine	ug/kg	ND	330	ND	330	ND	330
Pyrene	ug/kg	ND	330	ND	330	ND	330
Butylbenzylphthalate	ug/kg	ND	330	ND	330	ND	330
3,3'-Dichlorobenzidine	ug/kg	ND	330	ND	330	ND	330
Benzo(a)Anthracene	ug/kg	ND	330	ND	330	ND	330
Bis(2-Ethylhexyl) Phthalate	ug/kg	390	330	ND	330	ND	330
Chrysene	ug/kg	ND	330	ND	330	ND	330
Di-N-Octyl Phthalate	ug/kg	ND	330	ND	330	ND	330
Benzo(b)Fluoranthene	ug/kg	ND	330	ND	330	ND	330
Benzo(k)Fluoranthene	ug/kg	ND	330	ND	330	ND	330
Benzo(a)Pyrene	ug/kg	ND	330	ND	330	ND	330
Indeno(1,2,3-cd)Pyrene	ug/kg	ND	330	ND	330	ND	330
Dibenzo(a,h)Anthracene	ug/kg	ND	330	ND	330	ND	330
Benzo(g,h,i)Perylene	ug/kg	ND	330	ND	330	ND	330

Surrogate % Recovery:

Pentafluorophenol	122	108	105
4-Fluoroaniline	118	106	104
Decafluorobiphenyl	84	95	105

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413A
DATE SAMPLED: 08/17/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/20/92
DATE ANALYZED: 08/22/92
DATE REPORTED: 09/03/92
PAGE: Fourteen

Sample Type: Soil

<u>Method and Constituent:</u>	<u>Units</u>	<u>Method Blank</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>
EPA Method 8270:			
N-Nitrosodimethylamine	ug/kg	ND	330
Phenol	ug/kg	ND	330
Bis (-2-Chloroethyl) ether	ug/kg	ND	330
2-Chlorophenol	ug/kg	ND	330
1,3-Dichlorobenzene	ug/kg	ND	330
1,4-Dichlorobenzene	ug/kg	ND	330
1,2-Dichlorobenzene	ug/kg	ND	330
N-Nitroso-Di-N- Propylamine	ug/kg	ND	330
Hexachloroethane	ug/kg	ND	330
Nitrobenzene	ug/kg	ND	330
Isophorone	ug/kg	ND	330
2-Nitrophenol	ug/kg	ND	330
2,4-Dimethylphenol	ug/kg	ND	330
Bis(-2-Chloroethoxy) Methane	ug/kg	ND	330
2,4-Dichlorophenol	ug/kg	ND	330
1,2,4-Trichlorobenzene	ug/kg	ND	330
Naphthalene	ug/kg	ND	330

Concentrations reported as ND were not detected at or above the reporting limit.

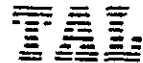


LOG NUMBER: 2413A
DATE SAMPLED: 08/17/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/20/92
DATE ANALYZED: 08/22/92
DATE REPORTED: 09/03/92
PAGE: Fifteen

Sample Type: Soil

<u>Method and Constituent:</u>	<u>Units</u>	<u>Method Blank</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>
EPA Method 8270 (Continued):			
Hexachlorobutadiene	ug/kg	ND	330
4-Chloro-3-Methyl- phenol	ug/kg	ND	330
Hexachlorocyclo- pentadiene	ug/kg	ND	330
2,4,6-Trichlorophenol	ug/kg	ND	330
2-Chloronaphthalene	ug/kg	ND	330
Dimethyl Phthalate	ug/kg	ND	330
Acenaphthylene	ug/kg	ND	330
Acenaphthene	ug/kg	ND	330
2,4-Dinitrophenol	ug/kg	ND	330
4-Nitrophenol	ug/kg	ND	330
2,4-Dinitrotoluene	ug/kg	ND	330
2,6-Dinitrotoluene	ug/kg	ND	330
Diethylphthalate	ug/kg	ND	330
4-Chlorophenylphenyl Ether	ug/kg	ND	330
Fluorene	ug/kg	ND	330
N-Nitrosodiphenylamine	ug/kg	ND	330
4-Bromophenylphenyl Ether	ug/kg	ND	330
Hexachlorobenzene	ug/kg	ND	330
Pentachlorophenol	ug/kg	ND	330
Phenanthrene	ug/kg	ND	330
Anthracene	ug/kg	ND	330

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413A
DATE SAMPLED: 08/17/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/20/92
DATE ANALYZED: 08/22/92
DATE REPORTED: 09/03/92
PAGE: Sixteen

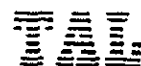
Sample Type: Soil

<u>Method and</u> <u>Constituent:</u>	<u>Units</u>	<u>Method Blank</u>	
		<u>Concen-</u> <u>tration</u>	<u>Reporting</u> <u>Limit</u>
EPA Method 8270 (Continued):			
Di-N-Butylphthalate	ug/kg	ND	330
Fluoranthene	ug/kg	ND	330
Benzidine	ug/kg	ND	330
Pyrene	ug/kg	ND	330
Butylbenzylphthalate	ug/kg	ND	330
3,3'-Dichlorobenzidine	ug/kg	ND	330
Benzo(a)Anthracene	ug/kg	ND	330
Bis(2-Ethylhexyl) Phthalate	ug/kg	ND	330
Chrysene	ug/kg	ND	330
Di-N-Octyl Phthalate	ug/kg	ND	330
Benzo(b)Fluoranthene	ug/kg	ND	330
Benzo(k)Fluoranthene	ug/kg	ND	330
Benzo(a)Pyrene	ug/kg	ND	330
Indeno(1,2,3-cd)Pyrene	ug/kg	ND	330
Dibenzo(a,h)Anthracene	ug/kg	ND	330
Benzo(g,h,i)Perylene	ug/kg	ND	330

Surrogate % Recovery:

Pentafluorophenol	101
4-Fluoroaniline	103
Decafluorobiphenyl	86

Concentrations reported as ND were not detected at or above the reporting limit.

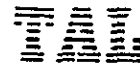


LOG NUMBER: 2413A
DATE SAMPLED: 08/18/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/19/92
DATE ANALYZED: 08/21/92
DATE REPORTED: 09/03/92
PAGE: Seventeen

Sample Type: Water

<u>Method and Constituent:</u>	<u>Units</u>	<u>BH20E-W</u>		<u>BH32E-W</u>		<u>Method Blank</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>
EPA Method 8270:							
N-Nitrosodimethylamine	ug/l	ND	10	ND	10	ND	10
Phenol	ug/l	ND	10	ND	10	ND	10
Bis (-2-Chloroethyl) ether	ug/l	ND	10	ND	10	ND	10
2-Chlorophenol	ug/l	ND	10	ND	10	ND	10
1,3-Dichlorobenzene	ug/l	ND	10	ND	10	ND	10
1,4-Dichlorobenzene	ug/l	ND	10	ND	10	ND	10
1,2-Dichlorobenzene	ug/l	ND	10	ND	10	ND	10
N-Nitroso-Di-N- Propylamine	ug/l	ND	10	ND	10	ND	10
Hexachloroethane	ug/l	ND	10	ND	10	ND	10
Nitrobenzene	ug/l	ND	10	ND	10	ND	10
Isophorone	ug/l	ND	10	ND	10	ND	10
2-Nitrophenol	ug/l	ND	10	ND	10	ND	10
2,4-Dimethylphenol	ug/l	ND	10	ND	10	ND	10
Bis(-2-Chloroethoxy) Methane	ug/l	ND	10	ND	10	ND	10
2,4-Dichlorophenol	ug/l	ND	10	ND	10	ND	10
1,2,4-Trichlorobenzene	ug/l	ND	10	ND	10	ND	10
Naphthalene	ug/l	ND	10	ND	10	ND	10

Concentrations reported as ND were not detected at or above the reporting limit.

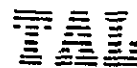


LOG NUMBER: 2413A
DATE SAMPLED: 08/18/92
DATE RECEIVED: 08/18/92
DATE EXTRACTED: 08/19/92
DATE ANALYZED: 08/21/92
DATE REPORTED: 09/03/92
PAGE: Eighteen

Sample Type: Water

Method and Constituent:	Units	BH20E-W		BH32E-W		Method Blank	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 8270 (Continued):							
Hexachlorobutadiene	ug/l	ND	10	ND	10	ND	10
4-Chloro-3-Methyl- phenol	ug/l	ND	10	ND	10	ND	10
Hexachlorocyclo- pentadiene	ug/l	ND	10	ND	10	ND	10
2,4,6-Trichlorophenol	ug/l	ND	10	ND	10	ND	10
2-Chloronaphthalene	ug/l	ND	10	ND	10	ND	10
Dimethyl Phthalate	ug/l	ND	10	ND	10	ND	10
Acenaphthylene	ug/l	ND	10	ND	10	ND	10
Acenaphthene	ug/l	ND	10	ND	10	ND	10
2,4-Dinitrophenol	ug/l	ND	10	ND	10	ND	10
4-Nitrophenol	ug/l	ND	10	ND	10	ND	10
2,4-Dinitrotoluene	ug/l	ND	10	ND	10	ND	10
2,6-Dinitrotoluene	ug/l	ND	10	ND	10	ND	10
Diethylphthalate	ug/l	ND	10	ND	10	ND	10
4-Chlorophenylphenyl Ether	ug/l	ND	10	ND	10	ND	10
Fluorene	ug/l	18	10	ND	10	ND	10
N-Nitrosodiphenylamine	ug/l	ND	10	ND	10	ND	10
4-Bromophenylphenyl Ether	ug/l	ND	10	ND	10	ND	10
Hexachlorobenzene	ug/l	ND	10	ND	10	ND	10
Pentachlorophenol	ug/l	ND	10	ND	10	ND	10
Phenanthrene	ug/l	ND	10	ND	10	ND	10
Anthracene	ug/l	ND	10	ND	10	ND	10

Concentrations reported as ND were not detected at or above the reporting limit.



LOG NUMBER: 2413A
 DATE SAMPLED: 08/18/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/19/92
 DATE ANALYZED: 08/21/92
 DATE REPORTED: 09/03/92
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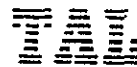
Sample Type: Water

Method and Constituent:	Units	BH20E-W		BH32E-W		Method Blank	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 8270 (Continued):							
Di-N-Butylphthalate	ug/l	ND	10	ND	10	ND	10
Fluoranthene	ug/l	ND	10	ND	10	ND	10
Benzidine	ug/l	ND	10	ND	10	ND	10
Pyrene	ug/l	ND	10	ND	10	ND	10
Butylbenzylphthalate	ug/l	ND	10	ND	10	ND	10
3,3'-Dichlorobenzidine	ug/l	ND	10	ND	10	ND	10
Benzo(a)Anthracene	ug/l	ND	10	ND	10	ND	10
Bis(2-Ethylhexyl) Phthalate	ug/l	34	10	12	10	ND	10
Chrysene	ug/l	ND	10	ND	10	ND	10
Di-N-Octyl Phthalate	ug/l	ND	10	ND	10	ND	10
Benzo(b)Fluoranthene	ug/l	ND	10	ND	10	ND	10
Benzo(k)Fluoranthene	ug/l	ND	10	ND	10	ND	10
Benzo(a)Pyrene	ug/l	ND	10	ND	10	ND	10
Indeno(1,2,3-cd)Pyrene	ug/l	ND	10	ND	10	ND	10
Dibenzo(a,h)Anthracene	ug/l	ND	10	ND	10	ND	10
Benzo(g,h,i)Perylene	ug/l	ND	10	ND	10	ND	10

Surrogate % Recovery:

Pentafluorophenol	108	118	119
4-Fluoroaniline	105	113	113
Decafluorobiphenyl	78	85	88

Concentrations reported as ND were not detected at or above the reporting limit.



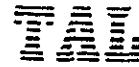
LOG NUMBER: 2413A
 DATE SAMPLED: 08/17/92 and 08/18/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/28/92, 08/31/92 and 09/01/92
 DATE ANALYZED: 09/01/92
 DATE REPORTED: 09/03/92
 PAGE: Twenty

Sample Type: Waste Extraction Test
 Extract of Soil

Method and Constituent:	Units	BH18E-5.0A		BH24E-5.0		BH25E-5.0	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 7210: Copper	ug/l	400	200	1,100	200	540	200
EPA Method 7420: Lead	ug/l	5,600	100	340	100	ND	100
EPA Method 7471: Mercury	ug/l	ND	2.0	ND	2.0	ND	2.0

Method and Constituent:	Units	BH30E-5.0		BH32E-5.0		BH33E-5.0	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 7210: Copper	ug/l	560	200	940	200	350	200
EPA Method 7420: Lead	ug/l	150	100	5,000	100	400	100
EPA Method 7471: Mercury	ug/l	ND	2.0	ND	2.0	ND	2.0

Concentrations reported as ND were not detected at or above the reporting limit.



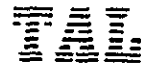
LOG NUMBER: 2413A
 DATE SAMPLED: 08/17/92 and 08/18/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/28/92, 08/31/92 and 09/01/92
 DATE ANALYZED: 09/01/92
 DATE REPORTED: 09/03/92
 PAGE: Twenty One

Waste Extraction Test
 Sample Type: Extract of Soil

Method and Constituent:	Units	Method Blank		QC Summary	
		Concen- tration	Reporting Limit	% Recovery	% RPD
EPA Method 7210: Copper	ug/l	ND	200	102	*
EPA Method 7420: Lead	ug/l	ND	100	94	*
EPA Method 7471: Mercury	ug/l	ND	2.0	105	*

Concentrations reported as ND were not detected at or above the reporting limit.

* The RPD is not reportable since the sample prepared in duplicate was not detectable.

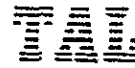


LOG NUMBER: 2413A
 DATE SAMPLED: 08/17/92 and 08/18/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/20/92
 DATE ANALYZED: 08/21/92 and 08/25/92
 DATE REPORTED: 09/03/92
 PAGE: Twenty Two

Sample Type: Soil

Method and Constituent:	Units	BH18E-5.0A		BH24E-5.0		BH25E-5.0	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 7210:							
Copper	ug/kg	520,000	5,000	38,000	5,000	22,000	5,000
EPA Method 7420:							
Lead	ug/kg	120,000	2,500	17,000	2,500	5,200	2,500
EPA Method 7471:							
Mercury	ug/kg	4,500	50	310	50	99	50
Method and Constituent:	Units	BH30E-5.0		BH32E-5.0		BH33E-5.0	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 7210:							
Copper	ug/kg	27,000	5,000	310,000	5,000	17,000	5,000
EPA Method 7420:							
Lead	ug/kg	5,600	2,500	760,000	2,500	26,000	2,500
EPA Method 7471:							
Mercury	ug/kg	110	50	730	50	91	50

Concentrations reported as ND were not detected at or above the reporting limit.

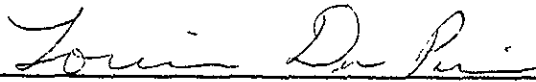


LOG NUMBER: 2413A
 DATE SAMPLED: 08/17/92 and 08/18/92
 DATE RECEIVED: 08/18/92
 DATE EXTRACTED: 08/20/92
 DATE ANALYZED: 08/21/92 and 08/25/92
 DATE REPORTED: 09/03/92
 PAGE: Twenty Three

Sample Type: Soil

Method and Constituent:	Units	Method Blank		QC Summary	
		Concen- tration	Reporting Limit	% Recovery	% RPD
EPA Method 7210: Copper	ug/kg	ND	5,000	81	0.0
EPA Method 7420: Lead	ug/kg	ND	2,500	92	11
EPA Method 7471: Mercury	ug/kg	ND	50	101	0.0

Concentrations reported as ND were not detected at or above the reporting limit.


 Louis W. DuPuis
 Quality Assurance/Quality Control Manager

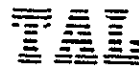
PROJECT NO.		PROJECT NAME		PARAMETERS										INDUSTRIAL HYGIENE SAMPLE		Y			
1457-027		PDDI - East														N			
SAMPLERS: (Signature) <i>Yvonne Lembi</i> Rick Strider				(Printed) Yvonne Lembi Rick Strider				NO. OF CONTAINERS TPH-G BTEX TPH-D OIL & GREASE (S770) (PF) B270 CUPBILITY TRC Salinity										REMARKS A A	
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION														
BH29E-7.5	8/17/92	1520		X	Soil	1	X	X	X	X							* RUSH: 48 hr TAT		
BH29E-5.0	↓	1535		X		1	X	X	X	X	X						* RUSH: 48 hr TAT		
BH30E-5.0	8/18/92	0755		X		1	X	X	X	X	X						A		
BH31E-7.5		0840		X		1	X	X	X	X									
BH32F-5.0		0910		X		1	X	X	X	X	X								
BH33E-5.0	↓	1010		X	↓	1	X	X	X	X	X								
BH27E-W	8/18/92	1123		X	Water	6	X	X	X	X	X						* RUSH: 48hr TAT		
BH20E-W		0929		X		6	X	X	X	X	X								
BH32E-W		1410		X		6	X	X	X	X	X								
LST-E	↓	0830		X	↓	5	X	X	X			X					* RUSH: 48hr TAT		

Relinquished by: (Signature) <i>[Signature]</i>	Date / Time	Received by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature) <i>Yvonne Lembi</i>	Date / Time 8/18/92/1650	Received by: (Signature)
(Printed)		(Printed)	(Printed)		(Printed)
Relinquished by: (Signature)	Date / Time	Received for Lab (Signature) <i>[Signature]</i>	Remarks Call Yvonne Lembi or Karry Kleinecke 916 962 1612 VERSAR picked up - water 5: 3-VOA; with HCL ex TP40 = 1-1.70r capres 260 = 1-1.70r ml c add HCL added A 146		
(Printed)		(Printed) <i>Laci</i>			



CHAIN OF CUSTODY RECORD

PROJECT NO.		PROJECT NAME				PARAMETERS							INDUSTRIAL HYGIENE SAMPLE	Y N
1457-027		PDD I - East												
SAMPLERS: (Signature) <i>Yvonne Lembi</i> <i>Rick Strider</i>					(Printed) YVONNE LEMBI RICK STRIDER					REMARKS log 2413				
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TPH-G	BTEX	TPH-D					
BH13E-5.0A	8/17/92	1021		X	soil	1	X	X	X	X	X			
BH19E-5.0		1010		X	soil	1	X	X	X	X	X			
BH20E-7.5		1015		X		1	X	X	X	X				
BH21E-2.5		1035		X		1	X	X	X	X				
BH22E-7.5		1115		X		1	X	X	X	X				
BH23E-2.5		1145		X		1	X	X	X	X				
BH23E-7.5		1155		X		1	X	X	X	X			(Hold) 8/21/92 analyze this sample per Yvonne Lembi	
BH24E-5.0		1300		X		1	X	X	X	X	X			
BH25E-5.0		1320		X		1	X	X	X	X	X			
BH26E-7.5		1345		X		1	X	X	X	X				
BH27E-5.0		1425		X		1	X	X	X	X			* RUST - 48 hi TAT	
BH28E-5.0	↓	1450		X	↓	1	X	X	X				* RUST - 48 TAT	
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)	
								<i>Yvonne Lembi</i>			8/18/92 / 1650			
(Printed)					(Printed)			(Printed)					(Printed)	
					YVONNE LEMBI									
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)			Date / Time		Remarks				
					<i>Louis D. Patis</i>			8/18/92 / 16:50		CALL Yvonne Lembi or Larry Klemm 916 962 1612 - VERSAR			• pick-up • soils = 1-B7 ea • Y-9 ref. 70	
(Printed)					(Printed)									



TOTAL PETROLEUM HYDROCARBONS AS DIESEL, KEROSENE, JET FUEL OR MOTOR OIL FOR SOIL

Method:

This method is based on the "Leaking Underground Fuel Tank (Luft) Field Manual," May 1988, prepared by the State of California. This method uses an alternative column and flow rate as specified below.

Sample Preparation:

Approximately 50 grams of soil are extracted with 80 ml of solvent on a mechanical shaker for 4 hours. The extract is filtered and dried with anhydrous sodium sulfate. It is then concentrated using a Kuderna-Danish apparatus and brought to 10ml.

Sample Introduction:

The extracts are analyzed by direct injection into a gas chromatograph (GC).

Gas Chromatography Analysis:

The extractable hydrocarbons are separated on a 6-ft by 2 mm I.D. gas chromatography column packed with 10% SP-2100 on Supelcoport and then detected by a flame ionization detector (FID).

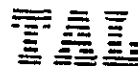
Gas Chromatograph Conditions:

CARRIER GAS:	Nitrogen
FLOW RATE:	30 ml/min.
INJECTOR TEMPERATURE:	250° C
DETECTOR TEMPERATURE:	300° C
INITIAL TEMPERATURE:	40° C
Hold for 4 minutes	
PROGRAM RATE:	10° C/min.
FINAL TEMPERATURE:	265° C
Hold for 10 minutes	

Calculation:

Total Petroleum Hydrocarbons as Diesel is quantified by comparing the sum of the area of peaks from the sample, that elute in the same time range as the standard, to the sum of the area of peaks in the standard. The standard may be diesel, kerosene, jet fuel, or other compounds depending on the source of the sample.

2/20/91



TOTAL PETROLEUM HYDROCARBONS AS DIESEL, KEROSENE, OR JET FUEL FOR WATER

Method:

This method is based on the "Leaking Underground Fuel Tank (Luft) Field Manual," May 1988, prepared by the State of California, and on the "Regional Board Staff Recommendations," May 1989, by the North Coast, San Francisco, and Central Valley Regional Water Quality Control Boards. This method uses an alternative column and flow rate as specified below.

Sample Preparation:

EPA Method 3510 (separatory funnel liquid-liquid extraction) is used to prepare water samples. The sample is extracted with methylene chloride three times. The extracts are combined, then filtered and dried with anhydrous sodium sulfate. It is then concentrated using a Kuderna-Danish apparatus and brought to 10ml.

Sample Introduction:

The extracts are analyzed by direct injection into a gas chromatograph (GC).

Gas Chromatography Analysis:

The extractable hydrocarbons are separated on a 6-ft by 2 mm I.D. gas chromatography column packed with 10% SP-2100 on Supelcoport and then detected by a flame ionization detector (FID).

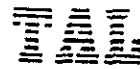
Gas Chromatograph Conditions:

CARRIER GAS:	Nitrogen
FLOW RATE:	30 ml/min.
INJECTOR TEMPERATURE:	250 ⁰ C
DETECTOR TEMPERATURE:	300 ⁰ C
INITIAL TEMPERATURE:	40 ⁰ C
	Hold for 4 minutes
PROGRAM RATE:	10 ⁰ C/min.
FINAL TEMPERATURE:	265 ⁰ C
	Hold for 10 minutes

Calculation:

Total Petroleum Hydrocarbons as Diesel is quantified by comparing the sum of the area of peaks from the sample, that elute in the same time range as the standard, to the sum of the area of peaks in the standard. The standard may be diesel, kerosene, jet fuel, or other compounds depending on the source of the sample.

1/2/90



TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (TPH-G) FOR SOIL,
BY PURGE AND TRAP

Method:

This method is based on the "Leaking Underground Fuel Tank (Luft) Field Manual," May 1988, prepared by the State of California, and on the "Regional Board Staff Recommendations," May 1989, by the North Coast, San Francisco, and Central Valley Regional Water Quality Control Boards. This method uses an alternative column, flow rate, and temperature program as specified below.

Sample Preparation:

Approximately 15 grams of the soil sample are added to 10 ml of methanol. The sample is extracted by agitation.

Sample Introduction:

Methanol extracts are introduced to the gas chromatograph (GC) by EPA Method 5030, Purge and Trap.

Gas Chromatography Analysis:

The volatile organics are separated on a 6-ft x 2 mm I.D. gas chromatography column packed with 5% SP-1200/1.75% Bentone-34 on Supelcoport. A flame ionization detector (FID) is used to detect total petroleum hydrocarbons as gasoline (TPH-G). The FID is preceded by a photoionization detector (PID).

Gas Chromatograph Conditions:

CARRIER GAS:	Nitrogen
FLOW RATE:	30 ml/min.
INJECTOR TEMPERATURE:	240 ^o C
DETECTOR TEMPERATURE:	270 ^o C
INITIAL TEMPERATURE:	50 ^o C
	Hold for 2 minutes
PROGRAM RATE:	6 ^o C/min.
FINAL TEMPERATURE:	90 ^o C
	Hold for 17 minutes

Calculation:

Total Petroleum Hydrocarbons as Gasoline is quantified by comparing the sum of the area of peaks from the sample to the sum of the area of peaks in the gasoline standard.

3/13/91



BENZENE, TOLUENE, XYLENES, AND ETHYLBENZENE (BTXE) FOR SOIL,
BY PURGE AND TRAP

Method:

This method is EPA Method 8020 as referenced in the "Leaking Underground Fuel Tank (Luft) Field Manual," May 1988, prepared by the State of California, and on the "Regional Board Staff Recommendations," May 1989, by the North Coast, San Francisco, and Central Valley Regional Water Quality Control Boards. This method uses an alternative carrier gas as specified below.

Sample Preparation:

Approximately 15 grams of the soil sample are added to 10 ml of methanol. The sample is extracted by agitation.

Sample Introduction:

Methanol extracts are introduced to the gas chromatograph (GC) by EPA Method 5030, Purge and Trap.

Gas Chromatography Analysis:

The volatile organics are separated on a 6-ft x 2 mm I.D. gas chromatography column packed with 5% SP-1200/1.75% Bentone-34 on Supelcoport. A photoionization detector (PID) is used to detect BTXE. The PID is followed by a flame ionization detector (FID).

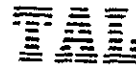
Gas Chromatograph Conditions:

CARRIER GAS:	Nitrogen
FLOW RATE:	30 ml/min.
INJECTOR TEMPERATURE:	240° C
DETECTOR TEMPERATURE:	270° C
INITIAL TEMPERATURE:	50° C
	Hold for 2 minutes
PROGRAM RATE:	6° C/min.
FINAL TEMPERATURE:	90° C
	Hold for 17 minutes

Calculation:

BTXE are identified by comparing the retention times of the sample peaks to those of the standards. BTXE are quantified by comparing the area of the sample peaks to those of the standards. If BTX or E is present and Total petroleum Hydrocarbons as Gasoline (TPH-G) is not, the analysis is confirmed by using a second column or a gas chromatograph mass spectrometer (GC/MS).

3/13/91



TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (TPH-G) FOR WATER,
BY PURGE AND TRAP

Method:

This method is based on the "Leaking Underground Fuel Tank (Luft) Field Manual," May 1988, prepared by the State of California, and on the "Regional Board Staff Recommendations," May 1989, by the North Coast, San Francisco, and Central Valley Regional Water Quality Control Boards. This method uses an alternative column, flow rate, and temperature program as specified below.

Sample Preparation:

There is no sample preparation other than dilution.

Sample Introduction:

Water samples are introduced to the gas chromatograph (GC) by EPA Method 5030, Purge and Trap. Up to 5 ml of sample is purged by this method.

Gas Chromatography Analysis:

The volatile organics are separated on a 6-ft x 2 mm I.D. gas chromatography column packed with 5% SP-1200/1.75% Bentone-34 on Supelcoport. A flame ionization detector (FID) is used to detect total petroleum hydrocarbons as gasoline (TPH-G). The FID is preceded by a photoionization detector (PID).

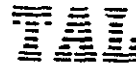
Gas Chromatograph Conditions:

CARRIER GAS:	Nitrogen
FLOW RATE:	30 ml/min.
INJECTOR TEMPERATURE:	240 ^o C
DETECTOR TEMPERATURE:	270 ^o C
INITIAL TEMPERATURE:	50 ^o C
Hold for 2 minutes	
PROGRAM RATE:	6 ^o C/min.
FINAL TEMPERATURE:	90 ^o C
Hold for 17 minutes	

Calculation:

Total Petroleum Hydrocarbons as Gasoline is quantified by comparing the sum of the area of peaks from the sample, to the sum of the area of peaks in the gasoline standard.

1/2/90



BENZENE, TOLUENE, XYLENES, AND ETHYLBENZENE (BTXE) FOR WATER,
BY PURGE AND TRAP

Method:

This method is EPA Method 8020 as referenced in the "Leaking Underground Fuel Tank (Luft) Field Manual," May 1988, prepared by the State of California, and on the "Regional Board Staff Recommendations," May 1989, by the North Coast, San Francisco, and Central Valley Regional Water Quality Control Boards. This method uses an alternative carrier gas as specified below.

Sample Preparation:

There is no sample preparation other than dilution.

Sample Introduction:

Water samples are introduced to the gas chromatograph (GC) by EPA Method 5030, Purge and Trap.

Gas Chromatography Analysis:

The volatile organics are separated on a 6-ft x 2 mm I.D. gas chromatography column packed with 5% SP-1200/1.75% Bentone-34 on Supelcoport. A photoionization detector (PID) is used to detect BTXE. The PID is followed by a flame ionization detector (FID).

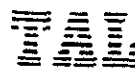
Gas Chromatograph Conditions:

CARRIER GAS:	Nitrogen
FLOW RATE:	30 ml/min.
INJECTOR TEMPERATURE:	240 ^o C
DETECTOR TEMPERATURE:	270 ^o C
INITIAL TEMPERATURE:	50 ^o C
Hold for 2 minutes	
PROGRAM RATE:	6 ^o C/min.
FINAL TEMPERATURE:	90 ^o C
Hold for 17 minutes	

Calculation:

BTXE are identified by comparing the retention times of the sample peaks to those of the standards. BTXE are quantified by comparing the area of the sample peaks to those of the standards. If BTX or E is present and Total petroleum Hydrocarbons as Gasoline (TPH-G) is not, the analysis is confirmed by using a second column or a gas chromatograph mass spectrometer (GC/MS).

1/2/90



EPA METHOD 8270, SEMIVOLATILE ORGANICS FOR SOIL

Method:

This is EPA Method 8270 from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846," 2nd edition, by the U.S. Environmental Protection Agency.

Sample Preparation:

Sample preparation is by EPA Method 3550, solvent extraction with sonication. Methylene chloride is the solvent used. The extraction is followed by a concentration process using a Kuderna-Danish apparatus.

Sample Introduction:

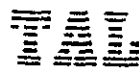
Samples are introduced by direct injection.

Gas Chromatography Analysis:

The semivolatile organics are separated on a capillary gas chromatography column. A mass spectrometer is used to detect the compounds.

Calculation:

Compounds are identified by comparing ion spectra with the ion spectra of the 8270 compounds in our standards. The compounds are quantified by using the internal standard method of calibration.



EPA METHOD 8270, SEMIVOLATILE ORGANICS FOR WATER

Method:

This is EPA Method 8270 from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846," 2nd edition, by the U.S. Environmental Protection Agency.

Sample Preparation:

Sample preparation is by EPA Method 3510, liquid-liquid extraction with a separatory funnel. Methylene chloride is the solvent used. The extraction is followed by a concentration process using a Kuderna-Danish apparatus.

Sample Introduction:

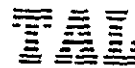
Samples are introduced by direct injection.

Gas Chromatography Analysis:

The semivolatile organics are separated on a capillary gas chromatography column. A mass spectrometer is used to detect the compounds.

Calculation:

Compounds are identified by comparing ion spectra with the ion spectra of the 8270 compounds in our standards. The compounds are quantified by using the internal standard method of calibration.



EPA METHOD 7210 - COPPER (Cu) BY FLAME

Method:

This method is from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846," 2nd Edition, by the U.S. Environmental Protection Agency.

Sample Preparation:

Water samples are prepared by EPA Method 3010, which is a digestion using acid and heat.

Soil samples are prepared by EPA Method 3050. The sample is dried, sifted, and digested with acid, hydrogen peroxide, and heat.

Atomic Absorption Conditions:

Lamp:	Copper
Wavelength:	324.8 nm
Heat Source:	Acetylene-Air flame

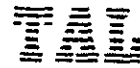
Atomic Absorption Analysis:

The sample is directly aspirated into the flame. The element entering the flame absorbs energy from the lamp. The atomic absorption unit will then display the concentration of the sample aspirated into the flame.

Calculation:

The concentration displayed is adjusted to account for the amount of sample used and the subsequent dilution of the sample.

1/2/90



EPA METHOD 7420 - LEAD (Pb) BY FLAME

Method:

This method is from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846," 2nd Edition, by the U.S. Environmental Protection Agency.

Sample Preparation:

Water samples are prepared by EPA Method 3010, which is a digestion using acid and heat.

Soil samples are prepared by EPA Method 3050. The sample is dried, sifted, and digested with acid, hydrogen peroxide, and heat.

Atomic Absorption Conditions:

Lamp:	Lead
Wavelength:	283.3 nm
Heat Source:	Acetylene-Air flame

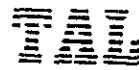
Atomic Absorption Analysis:

The sample is directly aspirated into the flame. The element entering the flame absorbs energy from the lamp. The atomic absorption unit then displays the concentration of the sample aspirated into the flame.

Calculation:

The concentration displayed is adjusted to account for the amount of sample used and the subsequent dilution of the sample.

1/2/90



EPA METHODS 7470 and 7471 - MERCURY (Hg) BY COLD VAPOR

Method:

This method is from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846," 2nd Edition, by the U.S. Environmental Protection Agency.

Sample Preparation:

Water samples are prepared by EPA Method 7470. The sample is digested with acid, potassium permanganate, and heat.

Soil samples are prepared by EPA Method 7471. The sample is dried, sifted, and digested with aqua regia, potassium permanganate, and heat.

Atomic Absorption Conditions:

Lamp:	Mercury
Wavelength:	253.7
Heat Source:	None

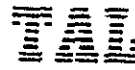
Atomic Absorption Analysis:

The sample is placed into a reaction vessel. A metal hydride gas is formed. The element absorbs energy from the lamp. The magnitude of the absorbance is displayed and also recorded on a strip chart recorder.

Calculation:

The concentration is quantified by comparing the magnitude of absorbance of the sample to the absorbance of standards. The calculation considers the amount of sample used and the subsequent dilution of the sample.

1/2/90



WASTE EXTRACTION TEST FOR SOIL

Method:

This method is from California Title 22, section 66700. The Waste Extraction Test (WET) is used to determine Soluble Threshold Limit Concentrations (STLC).

Procedure:

Soil is passed through a seive. 50 grams of sample is added to a glass container. 500 ml of a citric acid solution of pH 5 is added to the container. The sample is then extracted for 48 hours on a rotary extractor. The extract is filtered and preserved.

Analysis:

The analysis for the compounds of interest is the same as for a water sample.

7/18/90

Versar INC. SACRAMENTO

ATTACHMENT IV

Mr. George Brooks
Pacific Dry Dock, Yard I Western Section
March 16, 1992
STID 1420
Page 2.

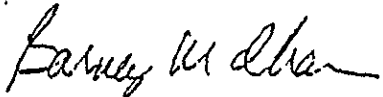
2. It was noticed that a number of borings were not run for any hydrocarbons analysis. The borings include BH42-BH45, BH20-BH21 and BH23-BH26. It is assumed that these samples did not show field observations which may have indicated potential contamination and were therefore not run. Please explain the reasoning for the absence of these analyses.

3. The proposed monitoring well locations are acceptable with the condition that after ground water gradient has been determined, a monitoring well should be located downgradient to all significant water or soil contaminant locations.

It was suggested that soil and ground water samples, which depict the estuary water and soil, be analyzed similarly for the parameters found on this site. In addition, total dissolved solids should be run in an attempt to establish the current water quality and likely long term affect of any residual hydrocarbon contamination left on site.

Upon clarification of the above items, you may proceed with the proposed Phase II Site Investigation. Please contact me at (510) 271-4320 should you have any questions.

Sincerely,



Barney M. Chan
Hazardous Materials Specialist

cc: M. Thomson, Alameda County District Attorney Office
R. Hiett, RWQCB
L. Kleinecke, Versar Inc.
H. Hatayama, DOHS
D. Schoenholtz, Port of Oakland

PhaseIII1441

Versar INC. SACRAMENTO

ATTACHMENT V



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

ALAMEDA COUNTY
Edward A. Campbell
Loni Hancock
Greg Harper
Frank H. Ogawa

August 13, 1992

CONTRA COSTA COUNTY
Paul L. Coeber
Sunna Wright McPeak
Tom Powers

Mr. George Cosby
CalMat Company
3200 San Fernando Road
Los Angeles, CA 90065

MARIN COUNTY
Al Aramouri

NAPA COUNTY
Paul Batsli
(Secretary)

Application Number: 8799
Equipment Location:
1441 Embarcadero
Oakland, CA

SAN FRANCISCO COUNTY
Roberta Achtenberg
Harry G. Britt

SAN MATEO COUNTY
Anna Sano
Chairperson;

Gentlemen:

Attached is your Permit to Operate the following:

SANTA CLARA COUNTY
Marina Clavenger
Rod Dindon
Joe Head
Dianne McKenna

S-1 Soil Extraction Treatment System, Rotary Thermal Desorber with Vapors controlled by a Thermal Oxidizer

SOLANO COUNTY
Gaby Davis

All Permits should be posted in a clearly visible and accessible place on or near the equipment to be operated, or kept available for inspection at any time.

SONOMA COUNTY
Jim Harderson
Patricia Milligoss
(Vice-Chairperson)

Operation of this equipment in violation of District Regulations or any permit conditions is subject to penalty action.

In the absence of specific permit conditions to the contrary, the throughputs, fuel and material consumptions, capacities and hours of operation described in your permit application will be considered maximum allowable limits. A new permit will be required before any increase in these parameters, or change in raw material handled may be made.

Please include your permit number with any correspondence with the District. If you have any questions on this matter, please call Brenton Smith, Air Quality Engineer Assistant at (415) 749-4690.

Very truly yours,

Milton Feldstein
Air Pollution Control Officer

by 
Permit Services Division

JAS:EGS:mag
Attachment



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

PERMIT TO OPERATE NO. 8799

PLANT NO. 8029

CALMAT PROPERTIES CO

IS HEREBY GRANTED A PERMIT TO OPERATE THE FOLLOWING EQUIPMENT: SOURCE NO. 1

Soil Extraction Treatment System, rotary thermal desorber with vapors controlled by a Thermal Oxidizer

LOCATED AT: 1441 EMBARCADERO

OAKLAND, CA

CONDITIONS: YES NO

SEE ATTACHED CONDITION #7697

MILTON FELDSTEIN
AIR POLLUTION CONTROL OFFICER

DATE August 13, 1992

BY John A. Swanson
PERMIT SERVICES DIVISION

EXPIRATION DATE: August 13, 1993

THIS PERMIT DOES NOT AUTHORIZE ANY VIOLATION OF THE RULES AND REGULATIONS OF THE BAAQMD OR THE HEALTH & SAFETY CODE OF THE STATE OF CALIFORNIA.

COND 7697

Conditions for S-1

1. This source shall be abated by A-3, Thermal Oxidizer, during all periods of operation.
2. The Precursor Organic Compound (POC) destruction efficiency of A-3, Thermal Oxidizer shall be maintained at a minimum of 99.0% by weight.
3. The Thermal Oxidizer, A-3, shall be properly maintained and kept in good operating condition at all times. In no event shall the minimum operating temperature of the thermal oxidizer be less than 1400 degrees F. The foreign object screen shall have particulate emissions abated by an aqueous mist when necessary. At no time shall particulate emissions exceed 0.5 on the Ringlemann Chart. Conveyed materials must be covered at all times.

To determine compliance with Condition Number 3, the thermal oxidizer, A-3, shall be equipped with continuous temperature measuring and recording instrumentation consisting of at least 1 temperature probe in the thermal incinerator and at least one recording device, which will continuously record temperature.

The temperature measuring and recording instrumentation to be installed and the specific placement within the thermal oxidizer of each of the temperature probes specified in Condition Number 4 shall be subject to the prior approval of the Source Test Section of the District Technical Division.

The temperature data collected from the temperature recorder shall be maintained in a file which shall be available for District inspection for a period of at least two (2) years following the last date of entry.

Within ten (10) days of start-up, the operator of this source shall conduct an efficiency test to determine the weight percent reduction of POC emissions through the Thermal Oxidizer, A-3. All test results shall be provided to the District within 30 days after testing has occurred. All source test methods shall be subject to the prior approval of the Source Test Section of the District's Technical Division.

The operator of this source shall maintain the following records for each day of operation of the source:

- a. The hours and time of operation.
- b. Each emission test or analysis result logged in for the day of operation they were taken.

These records shall be retained for at least two years from date of entry and be made available to BAAQMD

staff upon request.

9. Upon final completion of the remediation project the operator of S-6 shall notify the District at least two weeks after decommissioning the operation.