HAZARDOUS WASTE PRELIMINARY SITE INVESTIGATION REPORT
TASK ORDER NUMBER 04-911175-DH
CONTRACT NUMBER 43A0012

SOUTH OAKLAND MAINTENANCE STATION
1112 29th AVENUE
OAKLAND, CALIFORNIA

5-25-99

prepared for

CALIFORNIA DEPARTMENT OF TRANSPORTATION
District 4
111 Grand Avenue
Oakland, California 94623

prepared by

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May 25, 1999
575-9G014

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STATEMENT OF LIMITATIONS AND PROFESSIONAL CERTIFICATION

Information provided in this Site Investigation Report, prepared by Professional Service Industries, Inc. (PSI), is intended exclusively for the use of Caltrans for the evaluation of subsurface conditions as it pertains to the subject site. The professional services provided have been performed in accordance with practices generally accepted by other geologists, hydrologists, hydrogeologists, engineers, and environmental scientists practicing in this field. No other warranty, either expressed or implied, is made. As with all subsurface investigations, there is no guarantee that the work conducted identified any or all sources or locations of contamination.

This report is issued with the understanding that Caltrans is responsible for ensuring that the information contained herein is brought to the attention of the appropriate regulatory agency. This report has been reviewed by a geologist who is registered in the State of California and whose signature and license number appear below.

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Senior Geologist

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1.0 INTRODUCTION

Professional Service Industries, Inc. (PSI) has been retained by the California Department of Transportation (Caltrans), under Task Order Number 04-911175-DH and Contract Number 43A0012, to conduct a hazardous waste site assessment of current soil and groundwater conditions at the South Oakland Maintenance Station at 1112 29th Avenue, Oakland, California (subject site; Figure 1). The scope of work for this investigation included:

- A geophysical investigation to clear borings;
- Installation of six temporary groundwater monitoring wells;
- Collection of soil and groundwater samples to characterize soil and groundwater;
- Preparation of a report detailing the results of the investigation.

1.1 SITE DESCRIPTION

The site is currently used as a maintenance station by Caltrans. The maintenance station includes offices, a repair shop, a sign shop, and several material storage bins. The entire property covers approximately two acres. The site is paved with asphalt and is relatively flat. The Alameda/Oakland Estuary is approximately 0.5 miles southwest of the site.

One 4,000-gallon diesel underground storage tank (UST) and one 2,000-gallon gasoline UST were removed from the site on March 11, 1997. The tank pit was over-excavated and soil samples were collected. Sidewall and bottom samples collected from the excavation contained concentrations of Total Petroleum Hydrocarbons as Gasoline (TPH-G, [as high as 380 milligrams per kilogram (mg/kg)]), and Total Petroleum Hydrocarbons as Diesel (TPH-D, [as high as 21 mg/kg]). Concentrations of Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX), ranged from 0.010 to 48 mg/kg. Methyl Tertiary Butyl Ether (MTBE) concentrations ranged from 0.041 to 9.15 mg/kg. Groundwater samples were not collected (Caltrans, 1999).

1.2 PROJECT OBJECTIVE

The objective of the project is to delineate the extent of hydrocarbon impacted soil and groundwater at the site. Analytical results from the soil and groundwater investigations were examined with respect to regulatory requirements and guidelines.

2.0 PRE-FIELD ACTIVITIES

Prior to initiation of field activities, PSI marked the drilling locations with white paint and contacted Underground Service Alert a minimum of 48-hours prior to beginning work to locate any potential buried utilities.

A site-specific Health and Safety Plan (HSP) was developed in compliance with 29 CFR 1910.120, under the supervision of a Certified Industrial Hygienist. The HSP was designed to address the potential hazardous materials that may be encountered during field activities at the site and to minimize the exposure to potentially hazardous materials and unsafe working conditions to on-site personnel (PSI, 1999).

3.0 SUBSURFACE INVESTIGATION

3.1 GEOPHYSICAL SURVEY

PSI utilized Norcal Geophysical Surveys of Petaluma, California to perform a geophysical survey to clear soil boring locations. Norcal Geophysical completed the geophysical survey using ground-penetrating radar, magnetometry, and electromagnetic line locating.

The geophysical survey found no evidence of subsurface debris or utilities that may have obstructed drilling operations. The geophysical investigation was performed under the supervision of a California Registered Geophysicist (Norcal, 1999).

3.2 SOIL BORINGS

On April 6 and 7, 1999, Borings B1 through B6 were drilled at the site. The boring locations are presented in Figure 2. All of the borings were converted to 1.3 centimeter (cm) (0.5-inch) inside diameter temporary groundwater monitoring wells. Borings were drilled using a Geoprobe 5300 drill rig. Fisch Environmental of Valley Springs, California provided drilling services.

The borings were advanced using a 0.038 meter (1.5-inch) diameter core sampler fitted with a retractable tip and lined with acetate sleeves. Soil samples were collected from each boring at depths of 1.52, 3, and 4.56 meters (5, 10, and 15 feet) below ground surface (bgs).

Soils were logged according to the "Soil and Rock Logging Classification Manual" of the State of California, Department of Transportation. Boring logs are presented in Appendix B. Soils observed during drilling activities consisted primarily of clay and sand mixtures. Groundwater was encountered approximately 1.5 meters (49 feet) below ground surface (bgs).

The soil samples were logged on chain-of-custody records and transported to Pace Analytical of Long Beach, California, a California Department of Health Services certified hazardous materials testing laboratory, following chain-of-custody protocol. The samples were maintained in a cooler with ice, or a refrigerator until transported to the analytical laboratory The analytical results are described in Section 4.

3.3 TEMPORARY MONITORING WELL INSTALLATION AND DEVELOPMENT

Temporary groundwater monitoring wells were constructed in all six of the soil borings. The well casings consisted of 1.3 centimeter (cm) (0.5-inch) inside diameter, Schedule 40 Polyvinyl chloride (PVC) casing with 0.025 cm (0.010-inch) machine-slotted screen from 1.5 to 6 meters (5 to 20 feet) bgs. The temporary wells were installed with a prepackaged sand pack and a sanitary seal. Following groundwater sampling, the casing of the temporary wells was removed and the borings were grouted with neat cement to grade using a tremie pipe.

Following installation, the wells were developed by bailing. The development water was collected in 55-gallon drums for proper disposal. Following completion of the well installation, the newly installed well casings and boring locations were surveyed by a professional Land Surveyor. The surveyor's report is presented in Appendix C. Elevation and location were surveyed to accuracy of at least 0.003 m (0.01 foot) vertically and 0.003 m (0.01 foot) horizontally.

3.4 GROUNDWATER SAMPLING

3.4.1 Groundwater Elevation and Hydraulic Gradient

On April 8, 1999 depth to groundwater measurements were collected from six wells (B1 through B6) at the site. The groundwater depths were measured using a groundwater probe. Based on a lack of product sheen or measurable thickness of product in sampling bailers, floating product was not encountered in any of the wells. The groundwater measurements were converted to groundwater elevation data. The data is presented in Table 1 and Figure 3. The calculated groundwater flow direction is to the east with a hydraulic gradient of 0.053 meter per meter (foot per foot).

Groundwater flow direction was measured to be to the east. Interpretation of the United States Geological Survey's topographic map titled, Oakland West, indicates groundwater would be expected to flow to the southwest, towards the Alameda Channel. The deviation from the expected direction may be due to operation of groundwater extraction well(s) for industrial use, dewatering of underground structures, or localized hydrogeology. It is noted that the highest concentrations of contaminants were reported in the well located south of the former tank pit, consistent with the expected flow direction.

3.4.2 Groundwater Sampling

Groundwater samples were collected from the temporary monitoring wells. Prior to the collection of groundwater samples, the monitoring wells were purged of a minimum of three well volumes of water until pH, conductivity, and temperature stabilized. The wells were allowed to recover to at least 80 percent of their original static groundwater levels prior to sampling.

The following procedures for well monitoring, well purging, and water sampling were implemented while sampling the wells:

1. All equipment was washed prior to entering the well with an Alconox solution, followed by one tap water rinse and a deionized water rinse.

2. Prior to purging the wells, depth-to-water was measured using a groundwater interface probe to an accuracy of 0.003 meters (0.01 foot). The measurements were made to the top of the well casing on the north side.

3. Water samples were collected with a single-use Teflon bailer after the well had been purged and water in the well had equilibrated to approximately 80 percent of the static water level. The water collected was immediately decanted into laboratory supplied vials and bottles. The containers were overfilled, capped, labeled, and placed in a chilled cooler prior to delivery to the laboratory for analysis.

4. Chain-of-custody procedures, including chain-of-custody forms, were used to document water sample handling and transport from collection to delivery to the laboratory for analyses.

5. Groundwater samples were delivered to the State-certified hazardous waste laboratory within approximately 48-hours of collection.

6. Purged water was contained in a DOT approved 55-gallon drum. The drum was labeled with the contents, date, well number, client name, and project number.

4.0 LABORATORY ANALYSIS PROGRAM

The soil and groundwater samples collected during this investigation were submitted to Pace Analytical, a State of California Department of Health Services certified hazardous waste laboratory.

4.1 SOIL AND GROUNDWATER

The following analytical methods were used to analyze soil and groundwater samples:

- EPA Method 8015 modified - Total Petroleum Hydrocarbons as Gasoline (TPH-G);
- EPA Method 8015 modified - Total Petroleum Hydrocarbons as Diesel (TPH-D);
- EPA Method 8260 – Volatile Organic Compounds (VOCs)

5.0 LABORATORY RESULTS

A summary of the analytical results are presented in Tables 2 and 3. A copy of the laboratory reports and chain-of-custody records are included in Appendix D.

5.1 LABORATORY ANALYTICAL RESULTS - SOIL

The soil analytical results are presented in Table 2. TPH-G was detected in one soil sample (B6-10 [13 mg/kg]). None of the soil samples contained detectable concentrations of TPH-D.

MTBE was the only VOC detected in the soil samples analyzed. MTBE was detected in the sample B5-1.5 meters (0.16 mg/kg). No other soil sample contained a detectable concentration of MTBE. The MTBE found in the soil sample collected from Boring B5 at 1.5 meters (5 feet) bgs could be related to the release from the former tank pit. The lack of other contaminants in Boring B5 and the lack of contaminants in any of the other soil samples collected from the borings located adjacent to the former tank pit indicates that soil contamination is limited to the former tank pit.

5.2 LABORATORY ANALYTICAL RESULTS - GROUNDWATER

Groundwater samples from temporary wells B1 through B6 were submitted to the laboratory for analysis. The groundwater analytical results are presented in Table 3

TPH-G was detected in groundwater samples from Wells B3 (520 µg/l) and B4 (520 µg/l). No other groundwater samples contained detectable concentrations of TPH-G. No TPH-D was detected in any of the groundwater samples.

Benzene was detected in the water sample from Well Wb3 (6.3 ug/l). MTBE was detected in the samples from Well WB5 (6,600 ug/l) and WB6 (24 ug/l). Concentrations of other gasoline related compounds were detected in samples from Wells WB1, WB3, WB4, and WB5.

Chloroform was detected in water samples from Wells WB4 (2.4 ug/l) and WB6 (2.7 ug/l). Tetrachloroethene (synonym Perchloroethene [PCE]) was detected in the water sample from Well WB6 (12 ug/l)

5.3 COMPARISON OF GROUNDWATER RESULTS WITH REGULATORY CRITERIA

The concentrations of contaminants reported by the analytical laboratory were compared to State of California Primary and Secondary Drinking Water Standards (PDWS and SDWS). The following samples were above their respective PDWS and/or SDWS.

- The benzene concentration detected in Well B3 (6.3 ug/l) exceeded the PDWS (1.0 ug/l).
- The MTBE concentration detected in Wells B5 (6,600 ug/l) and B6 (24 ug/l) exceeded the SDWS (5.0 ug/l).
- The PCE concentration detected in Well B6 (12 ug/l) exceeded the PDWS (5.0 ug/l).

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the information presented in this report, the following conclusions have been reached:

- The groundwater flow direction measured at the site is east with a hydraulic gradient of 0.053 meter per meter (foot per foot). The measured groundwater flow direction is not consistent with the anticipated flow direction interpreted from a topographic map. This anomaly may be due to nearby groundwater extraction or local hydrogeology.
- TPH-G and VOC concentrations were detected in two soil samples at the site. Soil contamination appears to be limited to the tank pit.
- TPH-G concentrations were detected in two of six groundwater samples at low concentrations
- A low concentration of benzene was detected in one groundwater sample.
- A moderate concentration of MTBE was detected in one groundwater sample, and a low concentration was detected in a second sample.
- Gasoline related compounds were reported in four of the six groundwater samples.
- Chloroform and/or PCE were detected in two groundwater samples.

Based on the results presented in this report, PSI recommends additional investigation to better delineate the extent of impacted groundwater. PSI recommends drilling three additional hydropunch borings to the south and east of Boring B5 to determine the extent of the MTBE impacted groundwater.

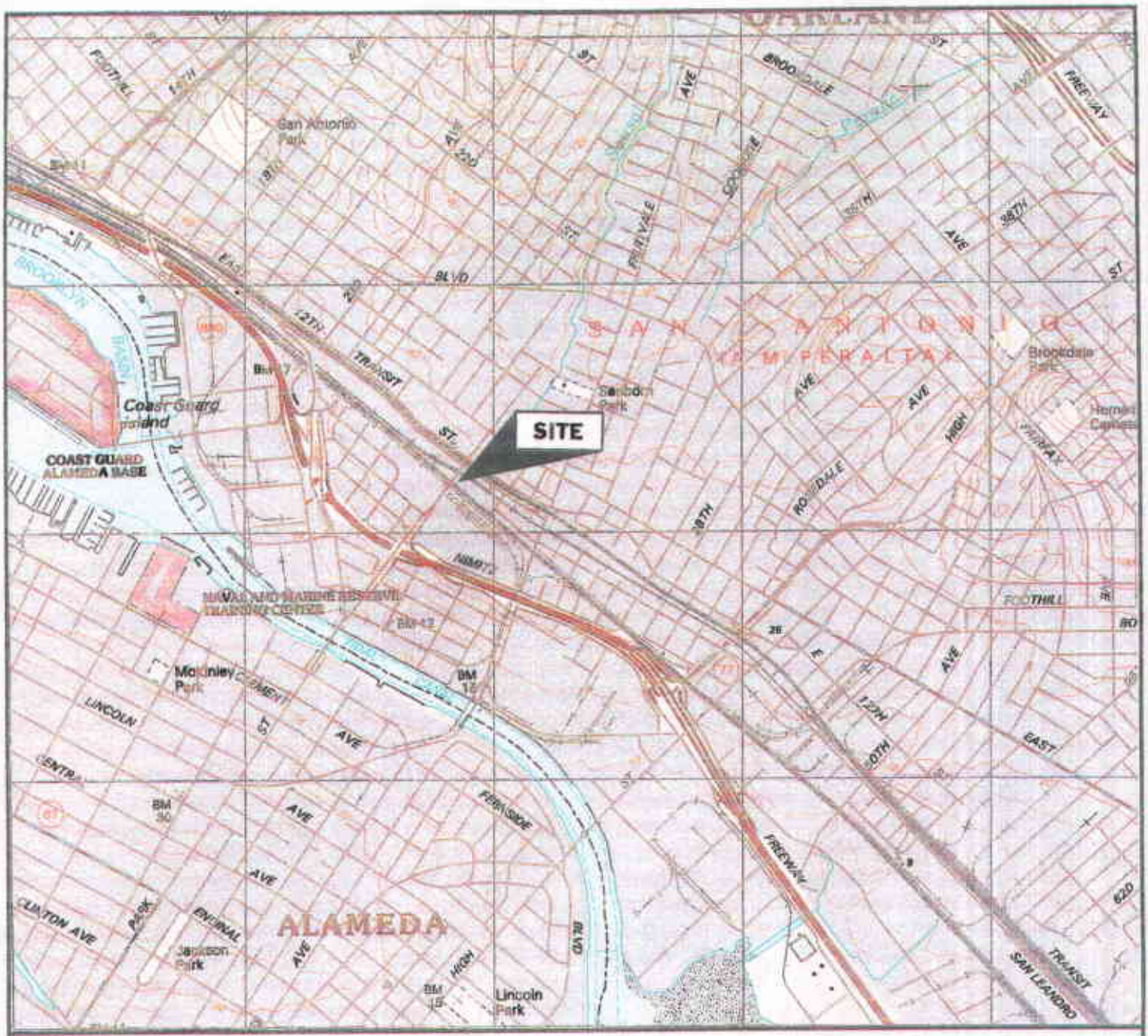
REFERENCES

Caltrans, 1999, Task Order # 04-911175-DH, Hazardous Waste Preliminary Site Investigation, prepared for Caltrans, March 4.

PSI, 1999, Health and Safety Plan, prepared for Caltrans, March 26.

PSI, 1997, Hazardous Waste Preliminary Site Investigation Workplan, prepared for Caltrans, March 26.

Norcal, 1999, Geophysical Results for the South Oakland Maintenance Station, prepared for PSI, April 6.



0 1/2 1 MILE

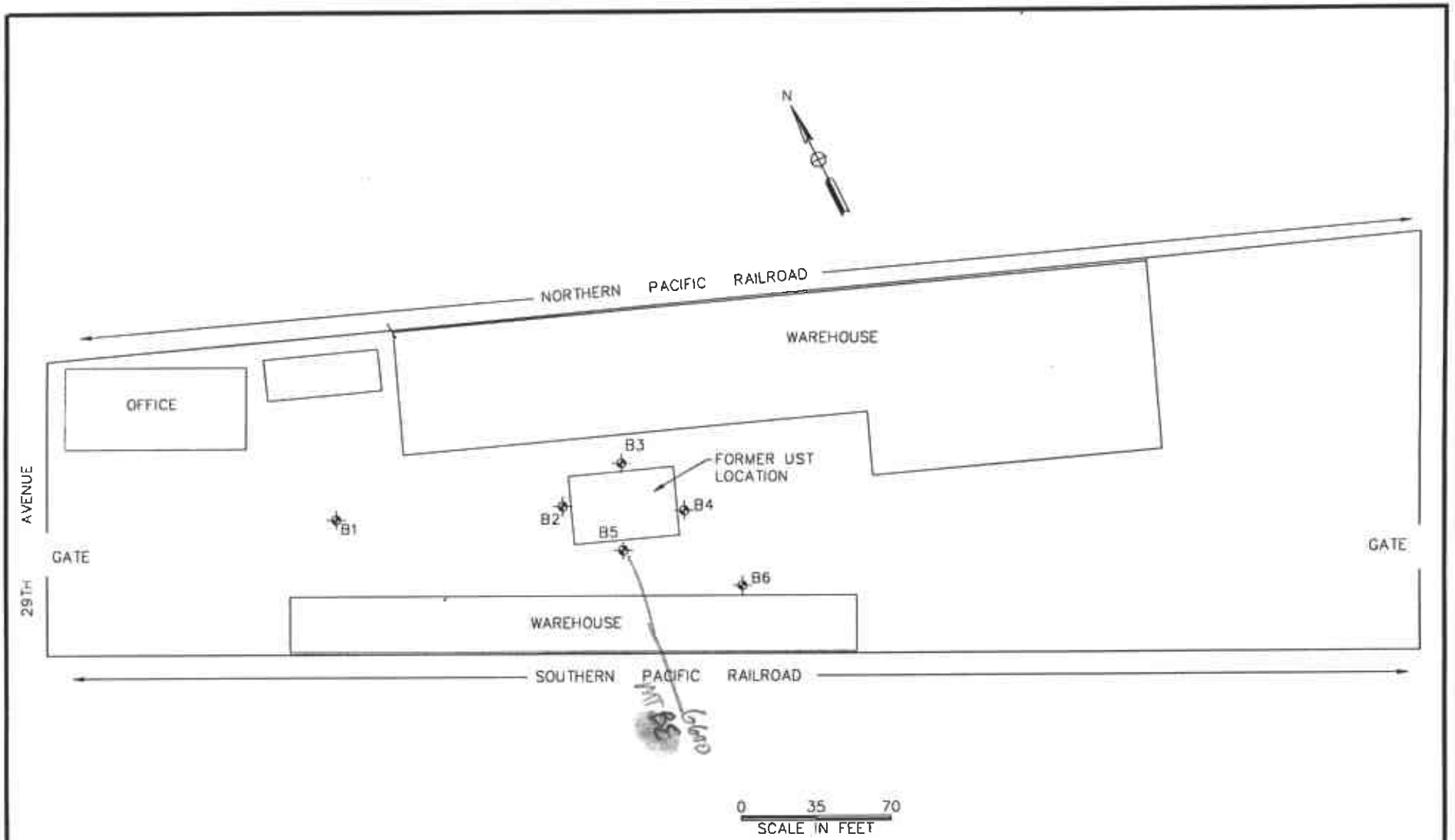
SCALE

REFERENCE:
U.S.G.S. OAKLAND EAST, CALIFORNIA, 1997

psi ENVIRONMENTAL GEOTECHNICAL CONSTRUCTION
CONSULTING • ENGINEERING • TESTING

SITE LOCATION
CALTRANS MAINTENANCE STATION
1112 29TH AVENUE
OAKLAND, CALIFORNIA
PROJECT NUMBER: 575-9G014

DATE: 3/23/99	CKD'D BY:	FIGURE NO.: 1
FILE NO.: 9G014-1		DRAWN BY: S. BOWERS



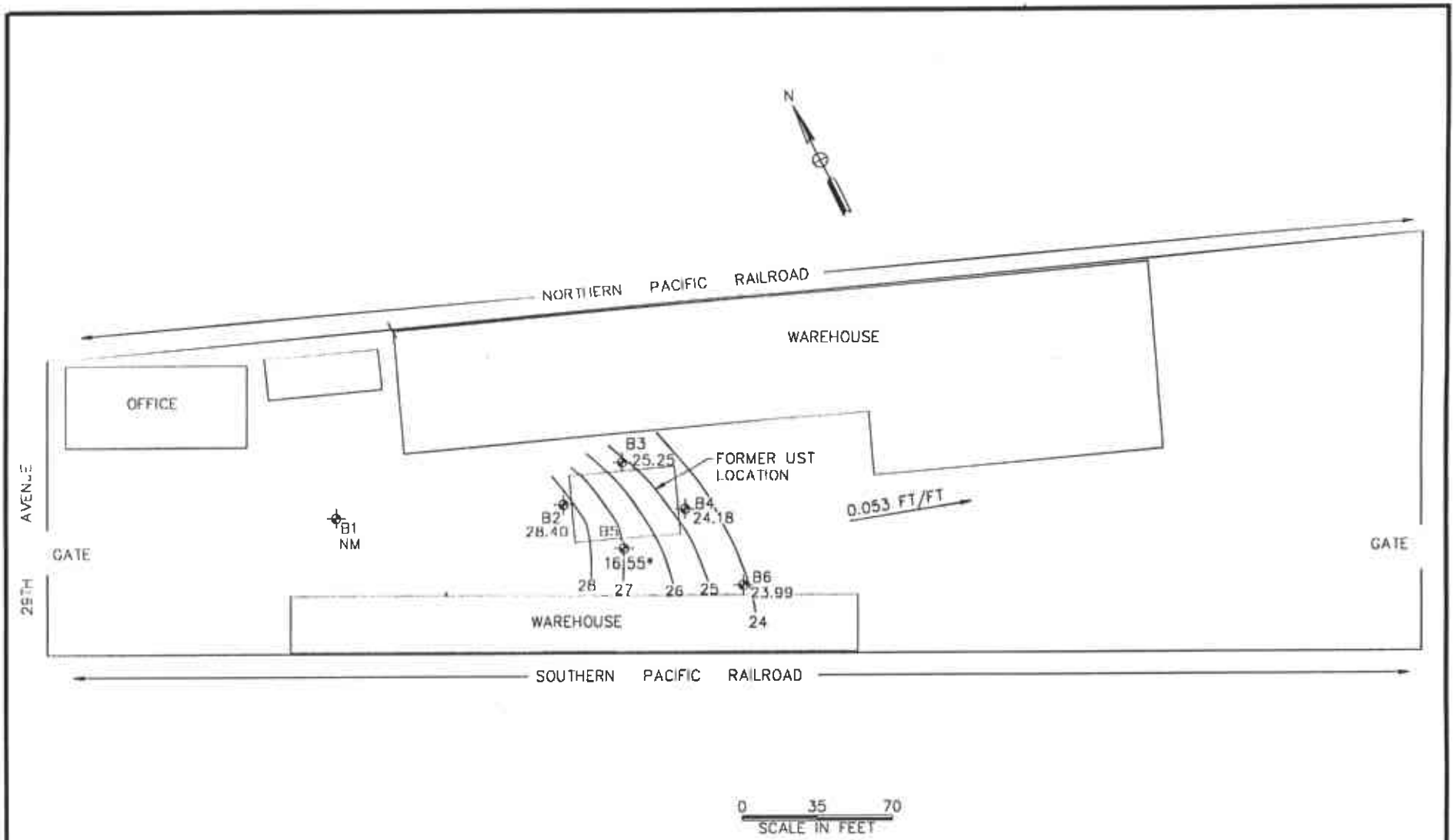
LEGEND

B1 SOIL BORING/TEMPORARY WELL LOCATION

PSI ENVIRONMENTAL GEOTECHNICAL CONSTRUCTION
CONSULTING • ENGINEERING • TESTING

SITE PLAN
CALTRANS MAINTENANCE STATION
1112 29TH AVENUE
OAKLAND, CALIFORNIA
PROJECT NUMBER: 575-9G014

DATE: 4/22/99	CKD BY:	FIGURE NO.: 2
FILE NO: 9G014-2		DRAWN BY: S.BOWERS



LEGEND

B2 SOIL BORING/TEMPORARY WELL LOCATION

28.40 GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL

25 LINE OF EQUAL GROUNDWATER ELEVATION

0.053 FT/FT GROUNDWATER FLOW DIRECTION AND GRADIENT

AN ASTERISK (*) INDICATES DATA NOT USED IN CONTOURING DUE TO ANOMALOUS READING.

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GROUNDWATER ELEVATION MAP: 4/8/99
CALTRANS MAINTENANCE STATION
1112 29TH AVENUE
OAKLAND, CALIFORNIA
PROJECT NUMBER: 575-9G014

DATE: 4/22/99	CKD BY:	FIGURE NO.: 3
FILE NO: 9G014-2		DRAWN BY: S.BOWERS

TABLE 1

GROUNDWATER ELEVATION DATA
SOUTH OAKLAND MAINTENANCE STATION
1112 29TH AVENUE
OAKLAND, CALIFORNIA

TEMPORARY WELL	TOC ELEVATION (feet msl)	DEPTH TO GROUNDWATER	GROUNDWATER ELEVATION
B-1	32.41	NM	---
B-2	32.97	4.57	28.40
B-3	33.52	8.27	25.25
B-4	32.99	8.81	24.18
B-5	33.11	16.56	16.55
B-6	32.59	8.60	23.99

Notes:

Depth to water measurements from 4/8/99.
TOC = Top of Casing.
msl = mean sea level.
All measurments are presented in feet.
NM = Not measured

TABLE 2

ANALYTICAL RESULTS FOR SOIL SAMPLES
SOUTH OAKLAND MAINTENANCE STATION
1112 29TH AVENUE
OAKLAND, CALIFORNIA

Sample I.D.	TPH-G mg/kg	TPH-D mg/kg	MTBE µg/kg	VOCs* µg/kg
B1-5	<1.0	<10	<5	ND
B1-10	<1.0	<10	<5	ND
B2-5	<1.0	<10	<5	ND
B2-10	<1.0	<10	<5	ND
B3-5	<1.0	<10	<5	ND
B3-10	<1.0	<10	<5	ND
B4-5	<1.0	<10	<5	ND
B4-10	<1.0	<10	<5	ND
B5-5	<1.0	<10	160	160
B5-10	<1.0	<10	<5	ND
B6-5	<1.0	<10	<5	ND
B6-10	13	<10	<5	ND

NOTES:

TPH-D = Total Petroleum Hydrocarbons as Diesel by EPA Method 8015M.

TPH-G = Total Petroleum Hydrocarbons as Gasoline by EPA Method 8015M.

MTBE = Methyl Tertiary Butyl Ether

VOCs* reported as the sum of all analytes detected in EPA Method 8260

TABLE 3

ANALYTICAL RESULTS FOR GROUNDWATER SAMPLES
SOUTH OAKLAND MAINTENANCE STATION
1112 29TH AVENUE
OAKLAND, CALIFORNIA

Sample I.D.	TPH-G µg/l	TPH-D mg/l	MTBE µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Total Xylenes µg/l	I-PB µg/l	N-propyl-benzene µg/l	Naph-thalene µg/l	1,2,4-TMB µg/l	1,3,5-TMB µg/l	Chloroform µg/l	PCE µg/l
WB1	<500	<10	<1.0	<0.5	<0.5	<0.5	2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
WB2	<500	<10	<1.0	<0.5	<0.5	<0.5	<1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
WB3	520	<10	<1.0	6.3	2.2	11	40	1.8	5.4	3.5	31.0	12.0	<0.5	<0.5
WB4	520	<10	<1.0	<0.5	<0.5	3.7	7.7	1.3	3.0	2.6	19.0	6.3	2.4	<0.5
WB5	<500	<10	6,600	<0.5	0.6	<0.5	<1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
WB6	<500	<10	24	<0.5	<0.5	<0.5	<1.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	12

NOTES:

TPH-D = Total Petroleum Hydrocarbons as Diesel by EPA Method 8015M.
TPH-G = Total Petroleum Hydrocarbons as Gasoline by EPA Method 8015M.
MTBE = Methyl Tertiary Butyl Ether
1,2,4 TMB = 1,2,4 Trimethylbenzene
1,3,5 TMB = 1,3,5 Trimethylbenzene
I-PB = iso-Propylbenzene
PCE = Tetrachloroethene (Synonym perchloroethen

APPENDIX A

PSI FIELD PROCEDURES

APPENDIX A
FIELD PROCEDURES

I. FIELD DOCUMENTATION OF SAMPLING PROCEDURES

The following outline describes the procedures adhered by PSI for proper sampling documentation.

1. Sampling procedures will be documented in field notes that contain:

    1. Sample collection procedures
    2. Date and time of collection
    3. Date of shipping
    4. Sample collection location
    5. Sample identification number(s)
    6. Intended analysis
    7. Quality control samples
    8. Sample preservation
    9. Name of sampler
    10. Any pertinent observations

2. Samples will be labeled with the following information:

    1. Sample designation number
    2. Date and time sample was collected
    3. Sampler's name
    4. Sample preservatives (if required)

3. The following is the sample designation system for the site:

    For Borings the samples will be labeled B-(Boring Number)-(Depth) (i.e. sample collected from boring 4 at 5 meters (feet) would be B4-5).

4. Handling of the samples will be recorded on a chain of custody form which shall include:

    1. Project name
    2. Site location
    3. Signature of Collector
    4. Date and time of collection
    5. Sample identification number
    6. Number of containers in sample set
    7. Description of sample and container
    8. Name and signature of persons, and the companies or agencies they represent, who are involved in the chain of possession
    9. Inclusive dates and times of possession
    10. Analyses to be completed

II. ADVANCING OF SOIL BORINGS AND COLLECTION OF SOIL SAMPLES

The following procedures were used for advancing soil borings and collecting soil samples at the site:

1. Prior to the commencement of soil boring activities at the site, soil boring locations were marked with white paint. Underground Service Alert (USA) was contacted to identify underground utilities in the vicinity of the soil borings.

2. Soil boring and sampling activities were conducted by Fisch Environmental of Valley Springs, California. The soil borings were advanced using GeoProbe direct push method. Flush-threaded rods with a stainless steel sampler were advanced into the ground using a hydraulic press and percussion hammer. The opening of the sampler was sealed with a drive tip held in place by a threaded pin.

3. Soil samples were collected using a .45 meter (1.5-foot long), 0.02 meter (1-inch) inside diameter macro-core stainless steel sampler. Soil samplers were washed between sampling intervals with Alconox soap followed by two deionized water rinses. The sampler was lined with clean brass, stainless steel, or acetate sleeves. When the boring was advanced to the desired sampling depth the threaded pin was removed allowing the drive tip to retract as the sampler was advanced 45 meter (1.5-foot long) into native soil using a percussion hammer.

4. After the sampler was retrieved the sleeves were extracted from the sampler without disturbing the sample. The sample was collected for analyses from the lowest tube in the sampler. The ends of the sample were covered with Teflon™ sheets and capped with polyethylene end caps. The sample was labeled and placed in a zip-lock bag in a chilled cooler prior to delivery to the laboratory for analyses.

5. Soil samples were assigned identification numbers such as B1-5, where B1 indicates the boring designation and -5 indicates that the sample was collected at 5 feet bgs. The samples were labeled with the project name, date and time of sample collection, sampling depth, and client name.

6. Chain-of-custody procedures using chain-of-custody records were implemented during handling and transportation of the samples to the laboratory for analyses.

7. Boring logs were prepared for the soil borings under the supervision of a California-Registered Geologist. Soil from each sample was described in accordance with Unified Soil Classification System by a PSI geologist and recorded on a field boring log. The data recorded on the logs were based on examination of soil samples retrieved in the tubes, and drilling conditions observed in the field. Boring logs include information regarding the location of each boring, geologic descriptions of materials encountered, occurrence of groundwater (if applicable) and organic vapor analyzer (OVA) measurements in the soil samples collected.

8. A HNU photoionizer (PID) was used to monitor volatile organic compounds (VOCs) in the ambient air during drilling at the site in accordance with the site health and safety plan. VOC concentrations in the soil were measured at the sampling depths by partially filling a zip-loc bag and closing the top. The components of the soil were allowed to volatilize and fill the head space in the bag for approximately 15 to 30 minutes prior to inserting the OVA probe through the top of the bag and recording the measurements.

9. No soil cuttings were generated during drilling, due to the use of a geoprobe drill rig.

III. BACKFILL OF SOIL BORINGS

The following procedures were used to backfill the soil borings at the site:

1. Soil borings were backfilled to grade with Portland grout slurry. The slurry consisted of neat cement and 5% bentonite powder.

APPENDIX B

BORING LOGS

SOIL BORING LOG

BORING NO:	B1
SHEET 1	OF 2

PROJECT NAME:	Caltrans: South Oakland Maintenance Station		
PROJECT NUMBER:	575-9G014	DATE:	4/6/99
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	Fisch Environmental		
DRILLING METHOD:	Direct Push (Geoprobe)		
BORING DIAMETER:	2 inch	DEPTH:	36 feet

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS
4/6/99	initial	32
4/7/99	stabilized	6.9

DEPTH (FEET)	SAMPLE NO.	RECOVERY (IN)	SAMPLE INTERVAL	BLOW COUNT	DESCRIPTION	PID (PPM)	USCS	REMARKS
0					Silty Clay, low plasticity, brown, damp, no odor.		CL	Asphalt Surface
5		16				0		
9					Clayey Silt, brown, low plasticity, damp, no odor.		ML	
10		14				0		
14								moisture increase.
15		18				0		
20		20			Log continues downward.	0		

REVIEWED BY: Tim O'Brien

LOGGED BY: Scott Bowers

SOIL BORING LOG

BORING NO:	B1
SHEET 2	OF 2

PROJECT NAME:	Caltrans: South Oakland Maintenance Station		
PROJECT NUMBER:	575-9G014	DATE:	4/6/99
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	Fisch Environmental		
DRILLING METHOD:	Direct Push (Geoprobe)		
BORING DIAMETER:	2 inch	DEPTH:	36 feet

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS

DEPTH (FEET)	SAMPLE NO.	RECOVERY (IN)	SAMPLE INTERVAL	BLOW COUNT	DESCRIPTION	PID (PPM)	USCS	REMARKS
20					Clayey Silt as described above.		ML	
24		17			Silty Clay, low to medium plasticity, damp, no odor		CL	
25						0		
29		12						moisture increase.
30						0		
34		20			Silty Sandy Gravel, coarse sand, fine gravel, tan, wet, no odor.		GW	
35						0		
36								Total Depth = 36 feet
37								Boring drilled to sufficient depth for investigation
38								Groundwater stabilized at 6.9 feet bgs.
39								Boring converted to temporary groundwater monitoring well.
40						0		Well grouted by removing casing and tremie placement of neat cement.

REVIEWED BY: Tim O'Brien

LOGGED BY: Scott A. Bowers

SOIL BORING LOG

BORING NO:	B2
SHEET 1	OF 1

PROJECT NAME:	Caltrans: South Oakland Maintenance Station		
PROJECT NUMBER:	575-9G014	DATE:	4/6/99
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	Fisch Environmental		
DRILLING METHOD:	Direct Push (Geoprobe)		
BORING DIAMETER:	2 inch	DEPTH:	20 feet

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS
4/6/99	initial	19
4/6/99	stabilized	5

DEPTH (FEET)	SAMPLE NO.	RECOVERY (IN)	SAMPLE INTERVAL	BLOW COUNT	DESCRIPTION	PID (PPM)	USCS	REMARKS
0					Silty Clay with some fine grained gravel, low to medium		CL	Asphalt surface
1					plasticity, brown, damp, no odor.			
2								
3								
4								
5		17				0		
6								
7								
8								
9								
10		12				0		
11								
12								
13								
14								
15		21				0		
16								Groundwater encountered at 19 feet bgs.
17								
18								Total Depth = 20 feet
19								Boring drilled to sufficient depth for investigation
20		22				0		Groundwater stabilized at 5 feet bgs.
								Boring converted to temporary groundwater monitoring well.
								Well grouted by removing casing and tremie placement of neat cement.

REVIEWED BY: Tim O'Brien

LOGGED BY: Scott Bowers

SOIL BORING LOG

BORING NO:	B3
SHEET 1	OF 1

PROJECT NAME:	Caltrans: South Oakland Maintenance Station		
PROJECT NUMBER:	575-9G014	DATE:	4/6/99
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	Fisch Environmental		
DRILLING METHOD:	Direct Push (Geoprobe)		
BORING DIAMETER:	2 inch	DEPTH:	20 feet

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS
4/6/99	initial	10
4/6/99	stabilized	5

DEPTH (FEET)	SAMPLE NO.	RECOVERY (IN)	SAMPLE INTERVAL	BLOW COUNT	DESCRIPTION	PID (PPM)	USCS	REMARKS
0					Silty Clay with some gravel, fine grained gravel, low to medium plasticity, brown, damp, no odor.		CL	Concrete surface
5		20				0		
10		21				0		Groundwater encountered.
15		24				0		
20		23				0		Total Depth = 20 feet Boring drilled to sufficient depth for investigation Groundwater stabilized at 5 feet bgs. Boring converted to temporary groundwater monitoring well. Well grouted by removing casing and tremie placement of neat cement.

REVIEWED BY: Tim O'Brien

LOGGED BY: Scott Bowers

SOIL BORING LOG

BORING NO:	B4
SHEET 1	OF 1

PROJECT NAME:	Caltrans: South Oakland Maintenance Station		
PROJECT NUMBER:	575-9G014	DATE:	4/6/99
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	Fisch Environmental		
DRILLING METHOD:	Direct Push (Geoprobe)		
BORING DIAMETER:	2 inch	DEPTH:	20 feet

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS
4/6/99	initial	9.5
4/6/99	stabilized	9.5

DEPTH (FEET)	SAMPLE NO.	RECOVERY (IN)	SAMPLE INTERVAL	BLOW COUNT	DESCRIPTION	PID (PPM)	USCS	REMARKS
0					Silty Clay with some gravel, fine grained gravel, low to medium plasticity, brown, damp, no odor.		CL	Asphalt surface
5		10				0		
10		20				0		Groundwater encountered.
15		24				0		
20		24				0		Total Depth = 20 feet Boring drilled to sufficient depth for investigation. Groundwater stabilized at 5 feet bgs. Boring converted to temporary groundwater monitoring well. Well grouted by removing casing and tremie placement of neat cement.

REVIEWED BY: Tim O'Brien

LOGGED BY: Scott Bowers

SOIL BORING LOG

BORING NO:	B5
SHEET 1	OF 1

PROJECT NAME:	Caltrans: South Oakland Maintenance Station		
PROJECT NUMBER:	575-9G014	DATE:	4/7/99
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	Fisch Environmental		
DRILLING METHOD:	Direct Push (Geoprobe)		
BORING DIAMETER:	2 inch	DEPTH:	20 feet

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS
4/7/99	initial	5
4/7/99	stabilized	5

DEPTH (FEET)	SAMPLE NO.	RECOVERY (IN)	SAMPLE INTERVAL	BLOW COUNT	DESCRIPTION	PID (PPM)	USCS	REMARKS
0					Silty Clay with some gravel, fine grained gravel, low to medium plasticity, brown, damp, no odor.		CL	Asphalt surface
5		17				0		Groundwater encountered.
10		12				0		
15		21				0		
20		22				0		Total Depth = 20 feet Boring drilled to sufficient depth for investigation Groundwater stabilized at 5 feet bgs. Boring converted to temporary groundwater monitoring well. Well grouted by removing casing and tremie placement of neat cement.

REVIEWED BY: Tim O'Brien

LOGGED BY: Scott Bowers

SOIL BORING LOG

BORING NO:	**B6**
SHEET 1	OF 1

PROJECT NAME:	Caltrans: South Oakland Maintenance Station		
PROJECT NUMBER:	575-9G014	DATE:	4/7/99
NORTHINGS:		EASTINGS:	
DRILLING COMPANY:	Fisch Environmental		
DRILLING METHOD:	Direct Push (Geoprobe)		
BORING DIAMETER:	2 inch	DEPTH:	20 feet

GROUNDWATER LEVELS

DATE	COMMENTS	DEPTH BGS
4/7/99	initial	8
4/7/99	stabilized	8

DEPTH (FEET)	SAMPLE NO.	RECOVERY (IN)	SAMPLE INTERVAL	BLOW COUNT	DESCRIPTION	PID (PPM)	USCS	REMARKS
0					Silty Clay with some fine grained gravel, low to medium plasticity, brown, damp, no odor.		CL	Asphalt surface
5		17				0		
8								Groundwater encountered.
10		12				17.5		
15		21				0		
20		22				0		Total Depth = 20 feet Boring drilled to sufficient depth for investigation. Groundwater stabilized at 8 feet bgs. Boring converted to temporary groundwater monitoring well. Well grouted by removing casing and tremie placement of neat cement.

REVIEWED BY: Tim O'Brien

LOGGED BY: Scott Bowers

APPENDIX C

SURVEY DATA

GENERAL NOTES:

(1) ALL DISTANCES ARE IN DECIMAL FEET UNLESS OTHERWISE NOTED.

(2) IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL THE UTILITIES MARKED BY THE RESPECTIVE UTILITY COMPANY PRIOR TO CONSTRUCTION.

(3) PRIOR TO ANY DIGGING, CALL U.S.A. (1-800-642-2444) AT LEAST 48

(4) GROUND CONDITIONS SHOWN HEREON REFLECT CONDITIONS ON THE DATE OF THE SURVEY.

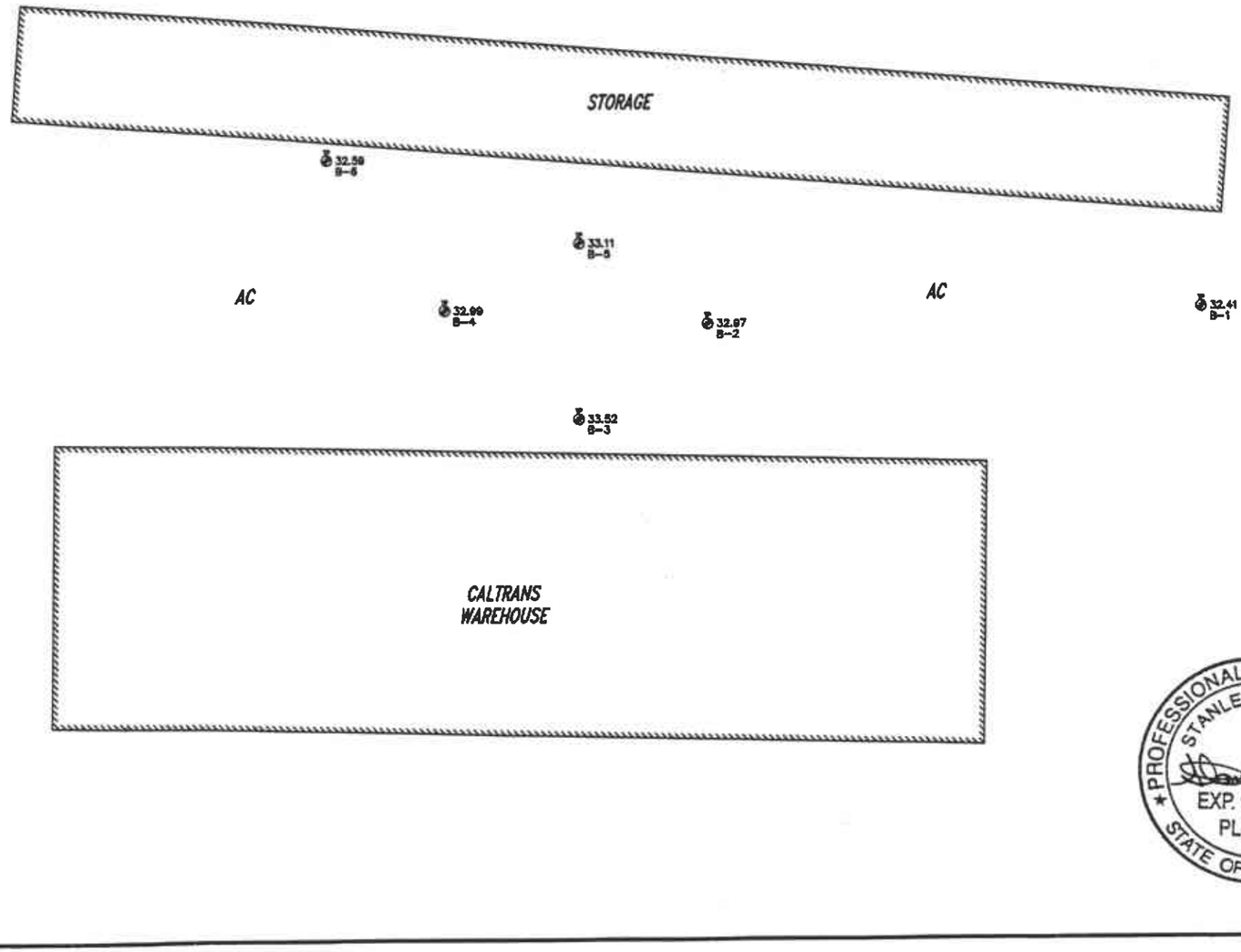
(5) THIS MAP WAS PREPARED FOR THE EXCLUSIVE USE OF PSI ENVIRONMENTAL, INC., USE BY ANY OTHER PARTY FOR ANY PURPOSE WHATSOEVER IS PROHIBITED AND NOT WARRANTED.

(6) ELEVATIONS SHOWN HEREON ARE TOP OF PVC PIPES AT THE NORTHERLY (PROJECT) EDGE.

(6) THIS IS NOT A BOUNDARY SURVEY.

BASIS OF ELEVATION

FOUND STANDARD CITY OF OAKLAND MONUMENT. IN THE EASTERLY SIDEWALK OF 29TH AVENUE, 5.9' SOUTHERLY OF THE SO. RAIL OF S.P.R.R., 7' EASTERLY OF THE EAST CURB OF 29TH AVENUE. EL.= 26.873' NGVD'29 DATUM.



LEGEND

TP TEMPORARY WELL

PROFESSIONAL LAND SURVEYOR
STANLEY T. GRAY
EXP. 9/30/2000
PLS 6784
STATE OF CALIFORNIA

TEMPORARY WELL SURVEY

OF
CALTRANS SO. OAKLAND MAINTENANCE STA.
1112 - 29TH AVENUE
PSI PROJECT NO. 575-9G014
CITY OF OAKLAND
PREPARED AT THE REQUEST OF
PSI ENVIRONMENTAL, INC.

COUNTY OF SAN MATEO — CALIFORNIA
SCALE: 1" = 30' — APRIL, 1999

MERIDIAN SURVEYING ENGINEERING, INC.
1812 UNION STREET
SAN FRANCISCO 94123
(415) 440-4131

100 DRAKES LANDING #164
GREENBRAE, CA 94904
(415) 461-1241

SURVEY	DMD/PC	DATE	04/08/99
DRAWN	DMD	PROJ. NO.	99044
APPROVED	STG	REVISION NO.	ORIGINAL
FILE NAME	99044	SHEET	1 OF 1

APPENDIX D

LABORATORY RESULTS AND CHAIN-OF-CUSTODY RECORDS

Pace Analytical

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815
Tel: 562-498-9515
Fax: 562-597-0786

Client Name: PROFESSIONAL SERVICE INDUSTRIES, INC.
1320 W. WINTON AVE
HAYWARD, CA 94545

Report To: FRANK POSS

Project Name: CALTRANS: S. OAKLAND M.S.
Site Location:

PACE ANALYTICAL Project #: 6029329
PACE ANALYTICAL WO #: 14723A
Client ID #: 575-9G-014

Date: 4/26/99

Pace Analytical Services, Inc. is pleased to provide you with analytical data for your above referenced project. Samples were collected on 04/06/99 and received on 04/08/99. Please refer to the chain of custody included at the end of this report for conditions of the samples upon receipt. In accordance with the chain of custody, the samples were analyzed for the following analytical parameters:

The analysis for 8260 was subcontracted to an outside laboratory with results attached.

Reviewed by,
Lily Bayati, Project Manager

REPORT OF LABORATORY ANALYSIS

Pace Analytical

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815
Tel: 562-498-9515
Fax: 562-597-0786

PACE ANALYTICAL Project#:6029329
PACE ANALYTICAL WO#:14723A
Client ID#:575-9G-014

Analyst: VN

Preparation Method: 5030
Matrix: Soil

ANALYSIS OF VOLATILE ORGANICS BY GAS CHROMATOGRAPHY/FID
GASOLINE (TPH-G) BY DOHS METHOD

Units		TPH Gasoline µg/kg	Surrogate Recovery %	PRL µg/kg	DF
Sample ID	**Analysis Date**				
Method Blank	04/08/99	<1000	88	1000	1
B1-5	04/08/99	<1000	81	1000	1
B1-10	04/08/99	<1000	88	1000	1
B2-5	04/08/99	<1000	88	1000	1
B2-10	04/08/99	<1000	81	1000	1
B3-5	04/08/99	<1000	87	1000	1
B3-10	04/08/99	<1000	84	1000	1
B4-5	04/08/99	<1000	84	1000	1
B4-10	04/08/99	<1000	85	1000	1
B5-5	04/08/99	<1000	84	1000	1
B5-10	04/08/99	<1000	85	1000	1
B6-5	04/08/99	<1000	81	1000	1
B6-10	04/08/99	**13,000**	78	1000	1
B4-10 Duplicate	04/08/99	<1000	83	1000	1
B5-5 Duplicate	04/08/99	<1000	82	1000	1

REPORT OF LABORATORY ANALYSIS

Pace Analytical

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815
Tel: 562-498-9515
Fax: 562-597-0786

PACE ANALYTICAL Project#:6029329
PACE ANALYTICAL WO#:14723A
Client ID#:575-9G-014

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

Analyst: VN

Preparation Method: 5030
Matrix: Soil

ANALYSIS OF VOLATILE ORGANICS BY GAS CHROMATOGRAPHY/FID
GASOLINE (TPH-G) BY DOHS METHOD

	Matrix Spike % REC	Matrix Spike Dup. % REC	Acceptable Range	RPD %	Acceptable Range
Analysis Date:	04/19/99	04/19/99			
Gasoline	98	99	70-130	2.0	0-25

REPORT OF LABORATORY ANALYSIS

Pace Analytical

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815

Tel: 562-498-9515
Fax: 562-597-0786

PACE ANALYTICAL Project#:6029329
PACE ANALYTICAL WO#:14723A
Client ID#:575-9G-014

Analyst: WK
Preparation Analyst: WK

Matrix: Soil

ANALYSIS OF TOTAL PETROLEUM HYDROCARBONS - DIESEL
EPA 8015 Modified

Units			TPH Diesel mg/Kg	PRL mg/Kg	DF
Sample ID	**Preparation Date**	**Analysis Date**			
Method Blank	4/9/99	4/9/99	<10	10	1
B1-5	4/9/99	4/9/99	<10	10	1
B1-10	4/9/99	4/9/99	<10	10	1
B2-5	4/9/99	4/9/99	<10	10	1
B2-10	4/9/99	4/9/99	<10	10	1
B3-5	4/9/99	4/9/99	<10	10	1
B3-10	4/9/99	4/9/99	<10	10	1
B4-5	4/9/99	4/9/99	<10	10	1
B4-10	4/9/99	4/9/99	<10	10	1
B5-5	4/9/99	4/9/99	<10	10	1
B5-10	4/9/99	4/9/99	<10	10	1
B6-5	4/9/99	4/9/99	<10	10	1
B6-10	4/9/99	4/9/99	<10	10	1
B1-10 Duplicate	4/9/99	4/9/99	<10	10	1
B6-5 Duplicate	4/9/99	4/9/99	<10	10	1

REPORT OF LABORATORY ANALYSIS

Pace Analytical

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815
Tel: 562-498-9515
Fax: 562-597-0786

PACE ANALYTICAL Project#:6029329
PACE ANALYTICAL WO#:14723A
Client ID#:575-9G-014

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

Analyst: WK
Preparation Analyst: WK

Matrix: Soil

ANALYSIS OF TOTAL PETROLEUM HYDROCARBONS - DIESEL
EPA 8015 Modified

	Matrix Spike % REC	Matrix Spike Dup. % REC	Acceptable Range	RPD %	Acceptable Range
Analysis Date:	4/9/99	4/9/99			
TPH-Diesel	118	115	61-127	2.6	0-25

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815
Tel: 562-498-9515
Fax: 562-597-0786

Pace Analytical

List of Abbreviations and Definitions

SM	=	Standard Methods for the examination of water and waste water
EPA	=	EPA approved methodology, 40 CFR Part 136
SW	=	EPA SW 846, Test Methods for Evaluating Solid Wastes
TCLP	=	Toxicity Characteristic Leaching Procedure
STLC	=	Soluble Threshold Limit Concentration
mg/L	=	milligrams per liter, parts per million (ppm), unit of measurement for a liquid
mg/Kg	=	milligrams per kilogram, parts per million (ppm), unit of measurement for a solid
µg/L	=	micrograms per liter, parts per billion (ppb), unit of measurement for a liquid
µg/Kg	=	micrograms per kilogram, parts per billion (ppb), unit of measurement for a solid
MDL	=	Laboratory Method Detection Limit, minimum level of detection derived from actual laboratory data
DF	=	Dilution Factor, the magnitude in which a sample must be diluted to eliminate matrix interference and/or to bring the sample concentration within the linear calibration range
RPD	=	Relative Percent Difference, measure of precision
% REC	=	Percent Recovery, measure of accuracy
<	=	less than, analyte of interest below stated numerical value
NA	=	Not Applicable
LCS	=	Laboratory Control Sample
DOHS	=	Department of Health Services
ELAP	=	Environmental Laboratory Accreditation Program
PRL	=	Pace Reporting Limit

REPORT OF LABORATORY ANALYSIS

Centrum Analytical Laboratories, Inc.

CERTIFIED HAZARDOUS WASTE TESTING LABORATORY • CHEMICAL AND BIOLOGICAL ANALYSES

Client: Pace Analytical
3960 E. Gilman Street
Long Beach, CA 90815

Date Sampled: 04/06/99
Date Received: 04/09/99
Job Number: 14729

Project: Caltrans: S. Oakland

CASE NARRATIVE

The following information applies to samples which were received on 04/09/99 :

The samples were received at the laboratory chilled and sample containers were intact.

Unless otherwise noted below, the Quality Control acceptance criteria were met for all samples for every analysis requested.

Report approved by:

Robert R. Clark, Ph.D.
Laboratory Director

ELAP # 1184

DL : Detection Limit -- The lowest level at which the compound can reliably be detected under normal laboratory conditions.
ND : Not Detected -- The compound was analyzed for but was not found to be present at or above the detection limit.
NA : Not Analyzed -- Per client request, this analyte was not on the list of compounds to be analyzed for.

Centrum
(800) 798-9336

EPA 8260 - Volatile Organics

Client: Pace Analytical
Project: Caltrans: S. Oakland
Job No.: 14729
Matrix: Soil
Analyst: JMR

Date Sampled: 04/06/99
Date Received: 04/09/99
Date Analyzed: 04/12-13/99
Batch Number: 8260S1642
8260S1644

	Sample ID:	Blank	B1-5	B1-10	B2-5	B2-10	B3-5
Compounds	DL	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Acetone	0.05	ND	ND	ND	ND	ND	ND
Benzene	0.001	ND	ND	ND	ND	ND	ND
Bromobenzene	0.005	ND	ND	ND	ND	ND	ND
Bromochloromethane	0.005	ND	ND	ND	ND	ND	ND
Bromodichloromethane	0.001	ND	ND	ND	ND	ND	ND
Bromoform	0.005	ND	ND	ND	ND	ND	ND
Bromomethane	0.005	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	0.01	ND	ND	ND	ND	ND	ND
n-Butylbenzene	0.002	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	0.002	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	0.002	ND	ND	ND	ND	ND	ND
Carbon disulfide	0.01	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	0.001	ND	ND	ND	ND	ND	ND
Chlorobenzene	0.001	ND	ND	ND	ND	ND	ND
Chloroethane	0.005	ND	ND	ND	ND	ND	ND
Chloroform	0.002	ND	ND	ND	ND	ND	ND
Chloromethane	0.001	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	0.002	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	0.002	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.002	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	0.002	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	0.01	ND	ND	ND	ND	ND	ND
Dibromomethane	0.001	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.001	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.002	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.002	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.005	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.001	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.001	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	0.005	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	0.002	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.002	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	0.001	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	0.001	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	0.001	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	0.001	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.001	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.001	ND	ND	ND	ND	ND	ND

EPA 8260 - Volatile Organics

Client:	Pace Analytical	Date Sampled:	04/06/99
Project:	Caltrans: S. Oakland	Date Received:	04/09/99
Job No.:	14729	Date Analyzed:	04/12-13/99
Matrix:	Soil	Batch Number:	8260S1642
Analyst:	JMR		8260S1644

	Sample ID:	Blank	B1-5	B1-10	B2-5	B2-10	B3-5
Compounds	DL	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Ethylbenzene	0.001	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.001	ND	ND	ND	ND	ND	ND
2-Hexanone	0.01	ND	ND	ND	ND	ND	ND
Isopropylbenzene	0.001	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	0.002	ND	ND	ND	ND	ND	ND
Methylene chloride	0.01	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	0.01	ND	ND	ND	ND	ND	ND
Methyl-tert-butyl ether (MtBE)	0.005	ND	ND	ND	ND	ND	ND
Napthalene	0.002	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.001	ND	ND	ND	ND	ND	ND
Styrene	0.001	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.001	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.002	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.001	ND	ND	ND	ND	ND	ND
Toluene	0.001	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	0.002	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.002	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.001	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.003	ND	ND	ND	ND	ND	ND
Trichloroethene	0.001	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	0.003	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	0.001	ND	ND	ND	ND	ND	ND
Trichlorotrifluoroethane	0.005	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	0.001	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	0.001	ND	ND	ND	ND	ND	ND
Vinyl chloride	0.002	ND	ND	ND	ND	ND	ND
Xylenes (total)	0.003	ND	ND	ND	ND	ND	ND

Surrogates (% recovery) Limits: 80 - 130

Sample ID:	Blank	B1-5	B1-10	B2-5	B2-10	B3-5
Dibromofluoromethane	108	107	111	107	107	104
Toluene-d8	98	98	102	99	99	96
Bromofluorobenzene	107	99	105	103	102	95

Centrum
(800) 798-9336

EPA 8260 - Volatile Organics

Client:	Pace Analytical	Date Sampled:	04/06/99
Project:	Caltrans: S. Oakland	Date Received:	04/09/99
Job No.:	14729	Date Analyzed:	04/12-13/99
Matrix:	Soil	Batch Number:	8260S1642
Analyst:	JMR		8260S1644

	Sample ID:	B3-10	B4-5	B4-10	B5-5	B5-10	B6-5
Compounds	DL	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Acetone	0.05	ND	ND	ND	ND	ND	ND
Benzene	0.001	ND	ND	ND	ND	ND	ND
Bromobenzene	0.005	ND	ND	ND	ND	ND	ND
Bromochloromethane	0.005	ND	ND	ND	ND	ND	ND
Bromodichloromethane	0.001	ND	ND	ND	ND	ND	ND
Bromoform	0.005	ND	ND	ND	ND	ND	ND
Bromomethane	0.005	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	0.01	ND	ND	ND	ND	ND	ND
n-Butylbenzene	0.002	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	0.002	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	0.002	ND	ND	ND	ND	ND	ND
Carbon disulfide	0.01	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	0.001	ND	ND	ND	ND	ND	ND
Chlorobenzene	0.001	ND	ND	ND	ND	ND	ND
Chloroethane	0.005	ND	ND	ND	ND	ND	ND
Chloroform	0.002	ND	ND	ND	ND	ND	ND
Chloromethane	0.001	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	0.002	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	0.002	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.002	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	0.002	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	0.01	ND	ND	ND	ND	ND	ND
Dibromomethane	0.001	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.001	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.002	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.002	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.005	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.001	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.001	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	0.005	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	0.002	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.002	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	0.001	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	0.001	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	0.001	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	0.001	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.001	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.001	ND	ND	ND	ND	ND	ND

EPA 8260 - Volatile Organics

Client:	Pace Analytical	Date Sampled:	04/06/99
Project:	Caltrans: S. Oakland	Date Received:	04/09/99
Job No.:	14729	Date Analyzed:	04/12-13/99
Matrix:	Soil	Batch Number:	8260S1642
Analyst:	JMR		8260S1644

	Sample ID:	B3-10	B4-5	B4-10	B5-5	B5-10	B6-5
Compounds	**DL**	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Ethylbenzene	0.001	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.001	ND	ND	ND	ND	ND	ND
2-Hexanone	0.01	ND	ND	ND	ND	ND	ND
Isopropylbenzene	0.001	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	0.002	ND	ND	ND	ND	ND	ND
Methylene chloride	0.01	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	0.01	ND	ND	ND	ND	ND	ND
Methyl-tert-butyl ether (MtBE)	0.005	ND	ND	ND	0.16	ND	ND
Napthalene	0.002	ND	ND	ND	ND	ND	ND
n-Propylbenzene	0.001	ND	ND	ND	ND	ND	ND
Styrene	0.001	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.001	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.002	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.001	ND	ND	ND	ND	ND	ND
Toluene	0.001	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	0.002	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.002	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.001	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.003	ND	ND	ND	ND	ND	ND
Trichloroethene	0.001	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	0.003	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	0.001	ND	ND	ND	ND	ND	ND
Trichlorotrifluoroethane	0.005	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	0.001	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	0.001	ND	ND	ND	ND	ND	ND
Vinyl chloride	0.002	ND	ND	ND	ND	ND	ND
Xylenes (total)	0.003	ND	ND	ND	ND	ND	ND

Surrogates (% recovery) Limits: 80 - 130

Sample ID:	B3-10	B4-5	B4-10	B5-5	B5-10	B6-5
Dibromofluoromethane	111	100	109	104	108	106
Toluene-d8	100	98	99	101	99	98
Bromofluorobenzene	106	97	100	100	102	99

EPA 8260 - Volatile Organics

Client:	Pace Analytical	Date Sampled:	04/06/99
Project:	Caltrans: S. Oakland	Date Received:	04/09/99
Job No.:	14729	Date Analyzed:	04/12-13/99
Matrix:	Soil	Batch Number:	8260S1642
Analyst:	JMR		8260S1644

	Sample ID:	B6-10
Compounds	**DL**	mg/Kg
Acetone	0.05	ND
Benzene	0.001	ND
Bromobenzene	0.005	ND
Bromochloromethane	0.005	ND
Bromodichloromethane	0.001	ND
Bromoform	0.005	ND
Bromomethane	0.005	ND
2-Butanone (MEK)	0.01	ND
n-Butylbenzene	0.002	ND
sec-Butylbenzene	0.002	ND
tert-Butylbenzene	0.002	ND
Carbon disulfide	0.01	ND
Carbon tetrachloride	0.001	ND
Chlorobenzene	0.001	ND
Chloroethane	0.005	ND
Chloroform	0.002	ND
Chloromethane	0.001	ND
2-Chlorotoluene	0.002	ND
4-Chlorotoluene	0.002	ND
Dibromochloromethane	0.002	ND
1,2-Dibromoethane	0.002	ND
1,2-Dibromo-3-chloropropane	0.01	ND
Dibromomethane	0.001	ND
1,2-Dichlorobenzene	0.001	ND
1,3-Dichlorobenzene	0.002	ND
1,4-Dichlorobenzene	0.002	ND
Dichlorodifluoromethane	0.005	ND
1,1-Dichloroethane	0.001	ND
1,2-Dichloroethane	0.001	ND
1,1-Dichloroethene	0.005	ND
cis-1,2-Dichloroethene	0.002	ND
trans-1,2-Dichloroethene	0.002	ND
1,2-Dichloropropane	0.001	ND
1,3-Dichloropropane	0.001	ND
2,2-Dichloropropane	0.001	ND
1,1-Dichloropropene	0.001	ND
cis-1,3-Dichloropropene	0.001	ND
trans-1,3-Dichloropropene	0.001	ND

Centrum
(800) 798-9336

EPA 8260 - Volatile Organics

Client:	Pace Analytical	Date Sampled:	04/06/99
Project:	Caltrans: S. Oakland	Date Received:	04/09/99
Job No.:	14729	Date Analyzed:	04/12-13/99
Matrix:	Soil	Batch Number:	8260S1642
Analyst:	JMR		8260S1644

	Sample ID:	B6-10
Compounds	**DL**	**mg/Kg**
Ethylbenzene	0.001	ND
Hexachlorobutadiene	0.001	ND
2-Hexanone	0.01	ND
Isopropylbenzene	0.001	ND
p-Isopropyltoluene	0.002	ND
Methylene chloride	0.01	ND
4-Methyl-2-pentanone	0.01	ND
Methyl-tert-butyl ether (MtBE)	0.005	ND
Napthalene	0.002	ND
n-Propylbenzene	0.001	ND
Styrene	0.001	ND
1,1,1,2-Tetrachloroethane	0.001	ND
1,1,2,2-Tetrachloroethane	0.002	ND
Tetrachloroethene	0.001	**0.003**
Toluene	0.001	ND
1,2,3-Trichlorobenzene	0.002	ND
1,2,4-Trichlorobenzene	0.002	ND
1,1,1-Trichloroethane	0.001	ND
1,1,2-Trichloroethane	0.003	ND
Trichloroethene	0.001	ND
1,2,3-Trichloropropane	0.003	ND
Trichlorofluoromethane	0.001	ND
Trichlorotrifluoroethane	0.005	ND
1,2,4-Trimethylbenzene	0.001	ND
1,3,5-Trimethylbenzene	0.001	ND
Vinyl chloride	0.002	ND
Xylenes (total)	0.003	ND

Surrogates (% recovery) Limits: 80 - 130

Sample ID:	B6-10
Dibromofluoromethane	115
Toluene-d8	92
Bromofluorobenzene	88

Centrum
(800) 798-9336

QC Sample Report - EPA Method 8260

Matrix: Soil
Batch #: 8260S1642

Batch Accuracy Results

Sample ID: Laboratory Control Sample

Analyte	Spike Concentration mg/Kg	% Recovery LCS	Acceptance Limits % Recovery	Pass/Fail
1,1-Dichloroethene	0.020	**92**	59 - 172	**Pass**
Benzene	0.020	**97**	66 - 142	**Pass**
Trichloroethene	0.020	**97**	71 - 137	**Pass**
Toluene	0.020	**97**	59 - 139	**Pass**
Chlorobenzene	0.020	**99**	60 - 133	**Pass**

Analytical Notes:

Batch Precision Results

MS/MSD Sample ID: B2-10

Analyte	Spike Sample Recovery mg/Kg	Spike Duplicate Recovery mg/Kg	Relative Percent Difference (RPD)	Upper Control Limit RPD	Pass/Fail
1,1-Dichloroethene	0.0182	0.0211	**15%**	22%	**Pass**
Benzene	0.0189	0.0217	**14%**	21%	**Pass**
Trichloroethene	0.0193	0.0210	**8%**	24%	**Pass**
Toluene	0.0184	0.0207	**12%**	21%	**Pass**
Chlorobenzene	0.0191	0.0221	**15%**	21%	**Pass**

Analytical Notes:

MS: Matrix Spike Sample
MSD: Matrix Spike Duplicate

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(800) 798-9336

QC Sample Report - EPA Method 8260

Matrix: Soil
Batch #: 8260S1644

Batch Accuracy Results

Sample ID: Laboratory Control Sample

Analyte	Spike Concentration mg/Kg	% Recovery LCS	Acceptance Limits % Recovery	Pass/Fail
1,1-Dichloroethene	0.020	**95**	59 - 172	**Pass**
Benzene	0.020	**99**	66 - 142	**Pass**
Trichloroethene	0.020	**96**	71 - 137	**Pass**
Toluene	0.020	**92**	59 - 139	**Pass**
Chlorobenzene	0.020	**97**	60 - 133	**Pass**

Analytical Notes:

Batch Precision Results

MS/MSD Sample ID: Laboratory Control Samples

Analyte	Spike Sample Recovery mg/Kg	Spike Duplicate Recovery mg/Kg	Relative Percent Difference (RPD)	Upper Control Limit RPD	Pass/Fail
1,1-Dichloroethene	0.0190	0.0202	**6%**	22%	**Pass**
Benzene	0.0199	0.0202	**2%**	21%	**Pass**
Trichloroethene	0.0191	0.0208	**8%**	24%	**Pass**
Toluene	0.0186	0.0194	**4%**	21%	**Pass**
Chlorobenzene	0.0195	0.0203	**4%**	21%	**Pass**

Analytical Notes:

MS: Matrix Spike Sample
MSD: Matrix Spike Duplicate

Centrum Analytical Laboratories, Inc.

290 TENNESSEE STREET
REDLANDS, CA 92373

(909) 798-9336 • (800) 798-9336
FAX (909) 793-1559

Chain of Custody Record

Centrum Job # 14723A
6029329

Analyses Requested 2999

Project No.:	Project Name:
575-9G014	Caltrans: S. Oakland M.S.
Project Manager: Frank Poss	**Phone:** (510) 785-1111 **Fax:** (510) 785-1197
Client Name: (Company) PSI	**Address:** 1320 W. Winton Ave., Hayward, CA

Turn-around time
- ☐ 24 Hr. RUSH*
- ☐ 48 Hr. RUSH*
- ☒ Normal TAT

* Requires prior approval, additional charges apply

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Date sampled	Time sampled	Sample matrix	Site location	Containers: # and type	GCMS: 8260 ~~8240 Gas/BTEX~~	8080: Pesticides PCBs Pest/PCB	8015M: Diesel ~~Fuel~~	8015M: Gasoline ~~8020/Gas/BTEX~~	418.1 (TRPH)	Semivolatiles: 8270 625	Metals: TTLC(CAM) PP RCRA	Lead Only	pH TDS TSS Conductivity COD	Flashpoint Fluoride Hex Chrome	Remarks/ Special Instructions
	B1-5	4/6/99	900	S		Acetate Sleeve	X		X	X							~~494155~~ 6029329
	B1-10	↓	915	↓		↓	↓		↓	↓							602494163
	B2-5		1215														602494171
	B2-10		1230														602494189
	B3-5		1310														602494197
	B3-10		1320														602494205
	B4-5		1450														602494213
	B4-10	↓	1500														602494270
	B5-5	4/7/99	845														602494288
	B5-10	↓	900	↓		↓	↓		↓	↓							602494296

Relinquished by: (Sampler's Signature)	Date	Time	Relinquished by:	Date	Time
	4/7/99	1700			
Received by:	Date	Time	Received by:	Date	Time
	4/8/99				
			Relinquished by:	Date	Time
			Received for Laboratory by:	Date	Time

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

To be completed by laboratory personnel:
- Samples chilled? ☒ Yes ☐ No 3°C
- Custody seals? ☒ Yes ☐ No
- All sample containers intact? ☒ Yes ☐ No
- ☐ Courier ☒ UPS/Fed Ex ☐ Hand carried

Sample Disposal
- ☐ Client will pick up
- ☐ Return to client
- ☐ Lab disposal fee $5

Laboratory Notes: * Include oxygenates in 8260 analysis

Sample Locator No.

White Copy - Original (Accompanies Samples) Yellow Copy - Centrum Files Pink Copy - Client Copy

Centrum Analytical Laboratories, Inc.
290 TENNESSEE STREET
REDLANDS, CA 92373
(909) 798-9336 • (800) 798-9336
FAX (909) 793-1559

Centrum Job # 14723A

Chain of Custody Record

Analyses Requested 2999

Project No.:	Project Name:
575-9G014	Caltrans: S. Oakland M.S.
Project Manager:	Phone: Fax:
Client Name: (Company) PSI	Address:

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Date sampled	Time sampled	Sample matrix	Site location	Containers: # and type	GCMS: 8260 ~~8240/8260/624~~	8080: Pesticides PCBs Pest/PCB	8015M: Diesel ~~Fuel Scan~~	8015M: Gasoline ~~8020/8021/BTEX~~	418.1 (TRPH)	Semivolatiles: 8270 625	Metals: TTLC(CAM) PP RCRA	Lead Only	pH TDS TSS Conductivity COD	Flashpoint Fluoride Hex Chrome			Remarks/ Special Instructions
	B6-5	4/7/99	1020	S		Acetate Sleeve	X		X	X									602494304
	B6-10	4/7/99	1030	S		↓	X		X	X									602494312

Turn-around time
- ☐ 24 Hr. RUSH*
- ☐ 48 Hr. RUSH*
- ☒ ~~Normal~~ TAT
  * Requires prior approval, additional charges apply

Relinquished by: (Sampler's Signature)	Date 4/7/99	Time 1700	Relinquished by:	Date	Time
Received by:	Date 4/8	Time	Received by:	Date	Time
			Relinquished by:	Date	Time
			Received for Laboratory by:	Date	Time

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

To be completed by laboratory personnel:
- Samples chilled? ☐ Yes ☐ No
- Custody seals? ☐ Yes ☐ No
- All sample containers intact? ☐ Yes ☐ No
- ☐ Courier ☐ UPS/Fed Ex ☐ Hand carried

Sample Disposal
- ☐ Client will pick up
- ☐ Return to client
- ☐ Lab disposal fee $5

Laboratory Notes: * Include oxygenates in 8260 analysis.

Sample Locator No.

White Copy - Original (Accompanies Samples) Yellow Copy - Centrum Files Pink Copy - Client Copy

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815
Tel: 562-498-9515
Fax: 562-597-0786

Pace Analytical

Client Name: PROFESSIONAL SERVICE INDUSTRIES, INC.
1320 W. WINTON AVE
HAYWARD, CA 94545

Report To: FRANK POSS

Project Name: CALTRANS: S. OAKLAND M.S.
Site Location:

PACE ANALYTICAL Project #: 6029331
PACE ANALYTICAL WO #: 14738A
Client ID #: 575-9G-014

Date: 4/30/99

Pace Analytical Services, Inc. is pleased to provide you with analytical data for your above referenced project. Samples were collected on 04/08/99 and received on 04/09/99. Please refer to the chain of custody included at the end of this report for conditions of the samples upon receipt. In accordance with the chain of custody, the samples were analyzed for the following analytical parameters:

The analysis for 8260 was subcontracted to an outside laboratory with results attached.

Lily Bayati

Reviewed by:
Lily Bayati, Project Manager

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815
Tel: 562-498-9515
Fax: 562-597-0786

Pace Analytical

PACE ANALYTICAL Project#:6029331
PACE ANALYTICAL WO#:14738A
Client ID#:575-9G-014

Analyst: VN

Preparation Method: 5030
Matrix: Water

ANALYSIS OF VOLATILE ORGANICS BY GAS CHROMATOGRAPHY/FID
GASOLINE (TPH-G) BY DOHS METHOD

Sample ID	Analysis Date	TPH Gasoline µg/L	Surrogate Recovery %	PRL µg/L	DF
Units					
Method Blank	04/16/99	<500	106	500	1
WB1	04/16/99	<500	108	500	1
WB2	04/16/99	<500	105	500	1
WB3	04/16/99	520	130	500	1
WB4	04/16/99	520	136	500	1
WB5	04/16/99	<500	87	500	1
WB6	04/16/99	<500	98	500	1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815
Tel: 562-498-9515
Fax: 562-597-0786

Pace Analytical

PACE ANALYTICAL Project#:6029331
PACE ANALYTICAL WO#:14738A
Client ID#:575-9G-014

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

Analyst: VN

Preparation Method: 5030
Matrix: Water

ANALYSIS OF VOLATILE ORGANICS BY GAS CHROMATOGRAPHY/FID
GASOLINE (TPH-G) BY DOHS METHOD

	Matrix Spike % REC	Matrix Spike Dup. % REC	Acceptable Range	RPD %	Acceptable Range
Analysis Date:	04/16/99	04/16/99			
Gasoline	95	95	70-130	0.0	0-25

REPORT OF LABORATORY ANALYSIS

Pace Analytical

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815

Tel: 562-498-9515
Fax: 562-597-0786

PACE ANALYTICAL Project#:6029331
PACE ANALYTICAL WO#:14738A
Client ID#:575-9G-014

Analyst: WK
Preparation Analyst: WK

Matrix: Water

ANALYSIS OF TOTAL PETROLEUM HYDROCARBONS - DIESEL
EPA 8015 Modified

Units			TPH Diesel mg/L	PRL mg/L	DF
Sample ID	Preparation Date	Analysis Date			
Method Blank	4/16/99	4/16/99	<10	10	1
WB1	4/16/99	4/16/99	<10	10	1
WB2	4/16/99	4/16/99	<10	10	1
WB3	4/16/99	4/16/99	<10	10	1
WB4	4/16/99	4/16/99	<10	10	1
WB6	4/16/99	4/16/99	<10	10	1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815
Tel: 562-498-9515
Fax: 562-597-0786

Pace Analytical

PACE ANALYTICAL Project#:6029331
PACE ANALYTICAL WO#:14738A
Client ID#:575-9G-014

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

Analyst: WK
Preparation Analyst: WK

Matrix: Water

ANALYSIS OF TOTAL PETROLEUM HYDROCARBONS - DIESEL
EPA 8015 Modified

	Matrix Spike % REC	Matrix Spike Dup. % REC	Acceptable Range	RPD %	Acceptable Range
Analysis Date:	4/16/99	4/16/99			
TPH-Diesel	106	104	61-127	1.9	0-25

REPORT OF LABORATORY ANALYSIS

Pace Analytical

Pace Analytical Services, Inc.
3970 Gilman St.
Long Beach, CA 90815
Tel: 562-498-9515
Fax: 562-597-0786

PACE ANALYTICAL Project#:6029331
PACE ANALYTICAL WO#:14738A
Client ID#:575-9G-014

List of Abbreviations and Definitions

SM	=	Standard Methods for the examination of water and waste water
EPA	=	EPA approved methodology, 40 CFR Part 136
SW	=	EPA SW 846, Test Methods for Evaluating Solid Wastes
TCLP	=	Toxicity Characteristic Leaching Procedure
STLC	=	Soluble Threshold Limit Concentration
mg/L	=	milligrams per liter, parts per million (ppm), unit of measurement for a liquid
mg/Kg	=	milligrams per kilogram, parts per million (ppm), unit of measurement for a solid
µg/L	=	micrograms per liter, parts per billion (ppb), unit of measurement for a liquid
µg/Kg	=	micrograms per kilogram, parts per billion (ppb), unit of measurement for a solid
MDL	=	Laboratory Method Detection Limit, minimum level of detection derived from actual laboratory data
DF	=	Dilution Factor, the magnitude in which a sample must be diluted to eliminate matrix interference and/or to bring the sample concentration within the linear calibration range
RPD	=	Relative Percent Difference, measure of precision
% REC	=	Percent Recovery, measure of accuracy
<	=	less than, analyte of interest below stated numerical value
NA	=	Not Applicable
LCS	=	Laboratory Control Sample
DOHS	=	Department of Health Services
ELAP	=	Environmental Laboratory Accreditation Program
PRL	=	Pace Reporting Limit

REPORT OF LABORATORY ANALYSIS

Centrum Analytical Laboratories, Inc.

CERTIFIED HAZARDOUS WASTE TESTING LABORATORY • CHEMICAL AND BIOLOGICAL ANALYSES

Client: Pace Analytical
3960 E. Gilman Street
Long Beach, CA 90815

Date Sampled: 04/06/99
Date Received: 04/09/99
Job Number: 14730

Project: Caltrans: S. Oakland

CASE NARRATIVE

The following information applies to samples which were received on 04/09/99 :

The samples were received at the laboratory chilled and sample containers were intact.

Unless otherwise noted below, the Quality Control acceptance criteria were met for all samples for every analysis requested.

Report approved by:

Robert R. Clark, Ph.D.
Laboratory Director

ELAP # 1184

DL : Detection Limit – The lowest level at which the compound can reliably be detected under normal laboratory conditions.
ND : Not Detected – The compound was analyzed for but was not found to be present at or above the detection limit.
NA : Not Analyzed – Per client request, this analyte was not on the list of compounds to be analyzed for.

EPA 8260 - Volatile Organics

Client: Pace Analytical
Project: Caltrans: S. Oakland
Job No.: 14730
Matrix: Water
Analyst: JMR

Date Sampled: 04/06/99
Date Received: 04/09/99
Date Analyzed: 04/12-13/99
Batch Number: 8260W1641

Sample ID:	Blank	WB1	WB2	WB3	WB4	WB5
Compounds	DL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Acetone	50	ND	ND	ND	ND	ND	ND
Benzene	0.5	ND	ND	ND	6.3	ND	ND
Bromobenzene	1.0	ND	ND	ND	ND	ND	ND
Bromochloromethane	1.0	ND	ND	ND	ND	ND	ND
Bromodichloromethane	0.5	ND	ND	ND	ND	ND	ND
Bromoform	0.5	ND	ND	ND	ND	ND	ND
Bromomethane	0.5	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	10	ND	ND	ND	ND	ND	ND
n-Butylbenzene	0.5	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	0.5	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	0.5	ND	ND	ND	ND	ND	ND
Carbon disulfide	10	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	0.5	ND	ND	ND	ND	ND	ND
Chlorobenzene	0.5	ND	ND	ND	ND	ND	ND
Chloroethane	0.5	ND	ND	ND	ND	ND	ND
Chloroform	0.5	ND	ND	ND	ND	2.4	ND
Chloromethane	0.5	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	0.5	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	0.5	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.5	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	0.5	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	10	ND	ND	ND	ND	ND	ND
Dibromomethane	0.5	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.5	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.5	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.5	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	0.5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.5	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.5	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	0.5	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	0.5	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.5	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	0.5	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	0.5	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	0.5	ND	ND	ND	ND	ND	ND
1,1-Dichloropropene	0.5	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.5	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.5	ND	ND	ND	ND	ND	ND

EPA 8260 - Volatile Organics

Client:	Pace Analytical	Date Sampled:	04/06/99
Project:	Caltrans: S. Oakland	Date Received:	04/09/99
Job No.:	14730	Date Analyzed:	04/12-13/99
Matrix:	Water	Batch Number:	8260W1641
Analyst:	JMR		

	Sample ID:	Blank	WB1	WB2	WB3	WB4	WB5
Compounds	**DL**	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Ethylbenzene	0.5	ND	ND	ND	**11**	**3.7**	ND
Hexachlorobutadiene	0.5	ND	ND	ND	ND	ND	ND
2-Hexanone	10	ND	ND	ND	ND	ND	ND
Isopropylbenzene	0.5	ND	ND	ND	**1.8**	**1.3**	ND
p-Isopropyltoluene	0.5	ND	ND	ND	ND	ND	ND
Methylene chloride	10	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	5.0	ND	ND	ND	ND	ND	ND
Methyl-tert-butyl ether (MtBE)	1.0	ND	ND	ND	ND	ND	**6,600**
Napthalene	0.5	ND	ND	ND	**3.5**	**2.6**	ND
n-Propylbenzene	0.5	ND	ND	ND	**5.4**	**3.0**	ND
Styrene	0.5	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.5	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	1.0	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.5	ND	ND	ND	ND	ND	ND
Toluene	0.5	ND	ND	ND	**2.2**	ND	**0.6**
1,2,3-Trichlorobenzene	0.5	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.5	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.5	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.5	ND	ND	ND	ND	ND	ND
Trichloroethene	0.5	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	0.5	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	0.5	ND	ND	ND	ND	ND	ND
Trichlorotrifluoroethane	5.0	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	0.5	ND	ND	ND	**31**	**19**	ND
1,3,5-Trimethylbenzene	0.5	ND	ND	ND	**12**	**6.3**	ND
Vinyl chloride	0.5	ND	ND	ND	ND	ND	ND
Xylenes (total)	1.5	ND	**2.0**	ND	**40**	**7.7**	ND

Surrogates (% recovery) Limits: 80 - 130

Sample ID:	Blank	WB1	WB2	WB3	WB4	WB5
Dibromofluoromethane	108	100	105	108	107	105
Toluene-d8	98	95	101	99	98	100
Bromofluorobenzene	107	102	102	96	110	101

EPA 8260 - Volatile Organics

Client:	Pace Analytical	Date Sampled:	04/06/99
Project:	Caltrans: S. Oakland	Date Received:	04/09/99
Job No.:	14730	Date Analyzed:	04/12-13/99
Matrix:	Water	Batch Number:	8260W1641
Analyst:	JMR		

Sample ID:		WB6
Compounds	**DL**	**µg/L**
Acetone	50	ND
Benzene	0.5	ND
Bromobenzene	1.0	ND
Bromochloromethane	1.0	ND
Bromodichloromethane	0.5	ND
Bromoform	0.5	ND
Bromomethane	0.5	ND
2-Butanone (MEK)	10	ND
n-Butylbenzene	0.5	ND
sec-Butylbenzene	0.5	ND
tert-Butylbenzene	0.5	ND
Carbon disulfide	10	ND
Carbon tetrachloride	0.5	ND
Chlorobenzene	0.5	ND
Chloroethane	0.5	ND
Chloroform	0.5	2.7
Chloromethane	0.5	ND
2-Chlorotoluene	0.5	ND
4-Chlorotoluene	0.5	ND
Dibromochloromethane	0.5	ND
1,2-Dibromoethane	0.5	ND
1,2-Dibromo-3-chloropropane	10	ND
Dibromomethane	0.5	ND
1,2-Dichlorobenzene	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
Dichlorodifluoromethane	0.5	ND
1,1-Dichloroethane	0.5	ND
1,2-Dichloroethane	0.5	ND
1,1-Dichloroethene	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,2-Dichloropropane	0.5	ND
1,3-Dichloropropane	0.5	ND
2,2-Dichloropropane	0.5	ND
1,1-Dichloropropene	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND

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EPA 8260 - Volatile Organics

Client:	Pace Analytical	Date Sampled:	04/06/99
Project:	Caltrans: S. Oakland	Date Received:	04/09/99
Job No.:	14730	Date Analyzed:	04/12-13/99
Matrix:	Water	Batch Number:	8260W1641
Analyst:	JMR		

Sample ID:		WB6
Compounds	**DL**	**µg/L**
Ethylbenzene	0.5	ND
Hexachlorobutadiene	0.5	ND
2-Hexanone	10	ND
Isopropylbenzene	0.5	ND
p-Isopropyltoluene	0.5	ND
Methylene chloride	10	ND
4-Methyl-2-pentanone	5.0	ND
Methyl-tert-butyl ether (MtBE)	1.0	**24**
Napthalene	0.5	ND
n-Propylbenzene	0.5	ND
Styrene	0.5	ND
1,1,1,2-Tetrachloroethane	0.5	ND
1,1,2,2-Tetrachloroethane	1.0	ND
Tetrachloroethene	0.5	**12**
Toluene	0.5	**0.6**
1,2,3-Trichlorobenzene	0.5	ND
1,2,4-Trichlorobenzene	0.5	ND
1,1,1-Trichloroethane	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Trichloroethene	0.5	ND
1,2,3-Trichloropropane	0.5	ND
Trichlorofluoromethane	0.5	ND
Trichlorotrifluoroethane	5.0	ND
1,2,4-Trimethylbenzene	0.5	ND
1,3,5-Trimethylbenzene	0.5	ND
Vinyl chloride	0.5	ND
Xylenes (total)	1.5	ND

Surrogates (% recovery) Limits: 80 - 130

Sample ID:	WB6
Dibromofluoromethane	109
Toluene-d8	98
Bromofluorobenzene	103

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QC Sample Report - EPA Method 8260

Matrix: Water
Batch #: 8260W1641

Batch Accuracy Results

Sample ID: Laboratory Control Sample

Analyte	Spike Concentration µg/L	% Recovery LCS	Acceptance Limits % Recovery	Pass/Fail
1,1-Dichloroethene	20.0	**92**	59 - 172	**Pass**
Benzene	20.0	**97**	66 - 142	**Pass**
Trichloroethene	20.0	**97**	71 - 137	**Pass**
Toluene	20.0	**97**	59 - 139	**Pass**
Chlorobenzene	20.0	**99**	60 - 133	**Pass**

Analytical Notes:

Batch Precision Results

MS/MSD Sample ID: Laboratory Control Sample

Analyte	Spike Sample Recovery µg/L	Spike Duplicate Recovery µg/L	Relative Percent Difference (RPD)	Upper Control Limit RPD	Pass/Fail
1,1-Dichloroethene	18.3	19.1	**4%**	22%	**Pass**
Benzene	19.5	21.4	**9%**	21%	**Pass**
Trichloroethene	19.4	20.8	**7%**	24%	**Pass**
Toluene	19.5	20.5	**5%**	21%	**Pass**
Chlorobenzene	19.8	21.6	**9%**	21%	**Pass**

MS: Matrix Spike Sample
MSD: Matrix Spike Duplicate

Analytical Notes:

Centrum Analytical Laboratories, Inc.

290 TENNESSEE STREET
REDLANDS, CA 92373

(909) 798-9336 • (800) 798-9336
FAX (909) 793-1559

Chain of Custody Record

Centrum Job # 60#14738A 602933/

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Project No.: 575-96014
Project Name: Caltrans: S. Oakland M.S.
Project Manager: Frank Poss
Phone: (510) 785-1111
Fax: (510) 785-1192
Client Name: (Company) PSI
Address: 1320 W. Winton Ave, Hayward, CA 94545

Turn-around time
- ☐ 24 Hr. RUSH*
- ☐ 48 Hr. RUSH*
- ☒ Normal TAT

* Requires prior approval additional charges apply

Analyses Requested

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Date sampled	Time sampled	Sample matrix	Site location	Containers: # and type	GCMS: 8260 ~~8240 8010 8020~~	8080: Pesticides PCBs Pest/PCB	8015M: Diesel Fuel Screen	8015M: Gasoline ~~8020~~	418.1 (TRPH)	Semivolatiles: 8270 625	Metals: TTLC(CAM) PP RCRA	Lead Only	pH TDS TSS Conductivity COD	Flashpoint Fluoride Hex Chrome					Remarks/ Special Instructions
	WB1	4/8/99	855	W		5-VOAs 1-1L Amber	X		X	X											602494353
	WB2	↓	915	↓		↓	↓		X	↓											602494361
	WB3	↓	1015	↓		↓	↓		X	↓											602494379
	WB4	↓	1030	↓		↓	↓		X	↓											602494387
	WB5	↓	1100	↓		4-Voas	↓			↓											602494486
	WB6	↓	1148	↓		5-Voas 1-1L Amber	↓		X	↓											602494494

Relinquished by: (Sampler's Signature)	Date	Time	Relinquished by:	Date	Time
[signature]	4/8/99	1700	[signature] Pace	4/9/99	1100
Received by:	Date	Time	Received by:	Date	Time
			Relinquished by:	Date	Time
			Received for Laboratory by:	Date	Time

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

To be completed by laboratory personnel:
- Samples chilled? ☒ Yes ☐ No 1°C
- Custody seals? ☒ Yes ☐ No
- All sample containers intact? ☒ Yes ☐ No
- ☐ Courier ☒ UPS/Fed Ex ☐ Hand carried

Sample Disposal
- ☐ Client will pick up
- ☐ Return to client
- ☒ Lab disposal fee $5

Laboratory Notes:

Sample Locator No.

White Copy - Original (Accompanies Samples) Yellow Copy - Centrum Files Pink Copy - Client Copy