PACIFIC
ENVIRONMENTAL
GROUP, INC.

Date 4/26/89

Project 330-53.01

To: ~~Mr. Lawrence~~ Seto Dennis

ALAMEDA COUNTY DEPT. OF ENVIRONMENTAL HEALTH

80 Swan Way Room 200

Oakland, CA 94621

We have enclosed

Copies	Description
1	One copy of the final Waste Oil Tank Removal Report for ARCO Service Station No. 6113, 785 East Stanley Boulevard, Livermore, California.

For your

X Use

____ Approval

____ Information

Comments: Mr. Seto, please find the enclosed final Waste Oil Tank Removal Report for ARCO Service Station No. 7113. If there are any questions regarding the contents of this report please call.

Sincerely,

John Baldwin

1601 Civic Center Drive, Suite 202, Santa Clara, California 95050, (408) 984-6536

PACIFIC
ENVIRONMENTAL
GROUP, INC.

April 26, 1989
Project No. 330-53.01

Mr. Rafat A. Shahid
Alameda County Health Care Services Agency
Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, CA 94621

RE: ARCO Station No. 6113
785 East Stanley Boulevard
Livermore, California.

Dear Mr. Shahid:

This letter is in response to the "Second Notice of Violation" sent to ARCO on April 7, 1989 by the Alameda County Health Care Services Agency. Transmitted herewith is a report prepared by Pacific Environmental Group, Inc. (PACIFIC) for ARCO, describing the procedures and results of the soil sampling performed relative to the removal of the waste oil tank at the subject site.

The findings of the report are summarized below:

- A soil sample collected below the former waste oil tank at a depth of 8-1/2 feet was found to contain non-detectable concentrations of high-boiling hydrocarbons and oil and grease. Thus, the maximum vertical extent of the soils containing hydrocarbons was determined and removed by excavation.

- No visual or olfactory evidence for hydrocarbons in the soil was noted along the east, south, or west side walls of the excavation. Soils were noted to be darker along the northern side wall of the excavation, and were sampled. Analytical results from a sample collected adjacent to the station building showed that the north side wall still contains petroleum hydrocarbons at levels of up to 1,100 ppm oil and grease. Additional soil excavation was and is not possible without threatening the integrity of the station building.

PACIFIC and ARCO determined that no further remedial activities associated with this tank removal are necessary based on the following factors:

- Residual hydrocarbons located beyond the north sidewall are believed to be limited to two feet beyond the north sidewall (based on findings at other sidewalls) and vertically to a maximum depth of 8-1/2 feet.

- The detected amounts of priority pollutants were well below levels designated to protect groundwater that the Regional Water Quality Control Board (RWQCB) suggests when these compounds are detected in the soil.

- According to information provided by the Alameda County Flood Control and Water Conservation District, at least 40 feet of unsaturated soils separates the detected oil and grease from the groundwater underlying the site (although significant fluctuations may occur due to nearby groundwater recharge facilities).

- The current building foundation limits recharge, thus reducing the leaching of the oil and grease, which still exists beneath the building.

In consideration of the findings of the soil sampling and analysis, ARCO intends no further action relative to the removal of the waste oil tank and affected soils.

If you have any questions regarding the accompanying report or this letter, please call.

Sincerely,

PACIFIC ENVIRONMENTAL GROUP, INC.

Robert K. Wenzlau
Senior Engineer
RCE 37395

enclosures

cc: Kyle Christie, ARCO
Chris Winsor, ARCO
Don Dalke, Regional Water Quality Control Board-Bay Area

PACIFIC
ENVIRONMENTAL
GROUP INC.

April 25, 1989
Project 330-53.01

Mr. Kyle Christie
ARCO Petroleum Products Company
P.O. Box 5811
San Mateo, CA 94403

Re: ARCO Station No. 6113
785 East Stanley Boulevard
Livermore, California

Dear Mr. Christie:

Pacific Environmental Group, Inc. (PACIFIC) is pleased to submit this report which describes the work performed for the removal of one waste oil tank at the subject site. PACIFIC's tasks included soil sampling during the removal of the existing tank and during extensions of the excavation, laboratory analysis of the samples, and instruction on the extent of soil removal.

BACKGROUND

ARCO Station No. 6113 is an operating service station and mini market located at 785 East Stanley Boulevard (where it joins with Murrieta) in Livermore, California (Figure 1). A 280-gallon tank located south of the station building was used to store waste oil (Figure 2).

SUMMARY OF WORK

Crosby & Overton, Inc. was contracted by ARCO to perform the construction activities associated with removal and disposal of the existing waste oil tank and nearby soil containing petroleum hydrocarbons. PACIFIC performed soil sampling, soil analysis, and, after evaluating field conditions as well as laboratory results, directed the removal of unsaturated soil containing petroleum hydrocarbons.

An "Underground Tank Closure/Modification" was submitted to Alameda County Health Care Services Agency, Department of Environmental Health by Crosby & Overton on September 20, 1988 and was accepted with modification on September 23, 1988. Tank removal was performed on January 26, 1989 and was witnessed by Mr. Gil Wistar of Alameda County Department of Health Services. Additional soil was excavated on February 3, 1989.

REMOVAL OF EXISTING WASTE OIL TANK AND DEGRADED SOIL

When the 280-gallon waste oil tank was removed on January 26, 1989, PACIFIC noted that the tank and its fill pipe showed no visible signs of leaks. The soil had no product odor, though soil on the north side wall of the excavation was slightly darker than the rest.

To obtain samples at two feet below the tank, a sampling zone specified by Alameda County's tank closure plan, the excavation was extended to approximately 7-1/2 feet below grade. One sample (WO-1) was collected in this zone beneath the center of the tank. A second sample (WOSW-N) was collected from the north side wall at a depth of 5 feet as instructed by Mr. Wistar. Soil removed during the excavation was stockpiled on site for disposal as hazardous waste.

A PACIFIC sampling technician collected the samples from locations marked on Figure 2. A backhoe bucket of native soil was obtained immediately after reaching the desired depth. Approximately three inches of soil was scraped from the surface of the soil in the backhoe bucket, then a clean brass ring was manually driven into the soil. The ends of the tube were covered with aluminum foil, capped with plastic end caps and placed in a sealed glass jar. The samples were labeled and logged onto chain-of-custody forms (enclosed), then immediately placed on ice for transport to International Technology Corporation, a state-certified laboratory in San Jose, California.

The soil samples were analyzed for parameters specified in "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks, June 2, 1988." The analyses tested for volatile organic compounds

according to EPA Methods 624 and 8240, semi-volatile organic compounds according to EPA Methods 625 and 8270, high boiling hydrocarbons by extraction with acetone, total oil and grease according to EPA Method 3550, metals according to EPA Method 6010, and low boiling hydrocarbons by a technique taken from EPA Methods 8015, 8020, and 5030. These laboratory methods are described on the enclosed certified analytical reports.

Total oil and grease was detected in WO-1 and WOSW-N at 660 parts per million (ppm) and 1,700 ppm, respectively. High boiling hydrocarbons (calculated as oil) were detected at 60 ppm and 790 ppm, respectively. No volatile organic compounds were detected. The analysis for semi-volatile organic compounds detected nine substances at concentrations ranging from 3.4 ppm to 21 ppm. The detected amounts were well below levels designated to protect groundwater that the Central Valley Regional Water Quality Control Board (RWQCB) suggested when these compounds occur in soil.[1] Chromium, lead and zinc were detected at concentrations ranging from 16 to 61 ppm. These concentrations are well below the RWQCB suggested levels to protect groundwater. A summary of all analytical results is presented on Tables 1 and 2.

On February 3, 1989, PACIFIC directed Crosby & Overton to extend the waste oil tank excavation to a depth of 8-1/2 feet (to remove residual petroleum hydrocarbons detected beneath the tank), and to laterally extend the north side wall 2-1/2 feet (to remove residual petroleum hydrocarbons beyond WOSW-N). All of the slightly darker soil on the north side wall was removed. As with the soil excavated during the waste oil tank removal at this site, no product odor was present in the additional excavated soil. The excavated soil was stockpiled on site for subsequent disposal as hazardous waste.

PACIFIC collected two samples to check for residual petroleum hydrocarbons after the excavation was extended. Sample WO-2 was obtained from the excavation floor at a depth of 8-1/2 feet. Side wall sample WOSW-N2 was taken from the north side wall of the extended pit at an approximate depth of 7 feet. Analyzed for total oil and

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[1] Water Quality Goals and Hazardous and Designated Levels for Chemical Constituents, California Regional Water Quality Control Board Central Valley Region, September 1986.

grease and high boiling hydrocarbons, the soil samples contained <10 ppm and 1,100 ppm total oil and grease, respectively. High boiling hydrocarbons (calculated as oil) were detected at <10 ppm and 800 ppm, respectively.

Although analytical results showed that the north side wall still contained petroleum hydrocarbons, additional soil excavation into this wall was not possible because of the wall's proximity to the station building. The pit was backfilled with clean fill to the original grade.

Disposal of the empty tank and excavated soil as hazardous waste was handled by ARCO and Crosby & Overton. The waste was hauled to Chemical Waste Management's Kettleman Hills facility. Hazardous waste manifest documents are maintained by ARCO.

CONCLUSION

The excavation program removed petroleum hydrocarbons in soil, with the exception of soil on the north side wall of the excavation. Total oil and grease was detected in the north side wall soil sample at 1,100 ppm, and high boiling hydrocarbons (calculated as oil) were detected at 800 ppm. The excavation was stopped because further soil removal would have threatened the stability of the station building.

Based on the finding of the investigation, an "Underground Storage Tank Unauthorized Release (Leak)/Contamination Site Report" was issued on February 8, 1988.

If you have any questions concerning the content of this report, please call.

Sincerely,

PACIFIC ENVIRONMENTAL GROUP, INC.

Robert K. Wenzlau
Senior Engineer
RCE 37395

RKW/jj

enclosures

cc: Chris Winsor, ARCO
Lawrence Seto, Alameda County Department of Environmental Health
Don Dalke, Regional Water Quality Control Board

TABLE 1

Summary of Analytical Results
Low Boiling Hydrocarbons, High Boiling Hydrocarbons, Oil & Grease
Soil Samples From Waste Oil Tank Excavation
Results in Parts per Million - Dry Soil Basis

		Low Boiling Hydrocarbons	High Boiling Hydrocarbons		Oil & Grease
Sample	Depth (ft.)	Gasoline	Diesel	Oil	
WO-1	7 1/2	<5.	160.*	60.	660.
WO-2	8 1/2	NT	<10.	<10.	<10.
WOSW-N	5	<5.	490.*	790.	1,700.
WOSW-N2	7	NT	30.*	800.	1,100.

NT = Not tested.

* = Chromatographic pattern of compounds detected and calculated as diesel does not match that of the diesel standard used for calibration.

highlighted samples taken after additional soil excavation on 2/3/89

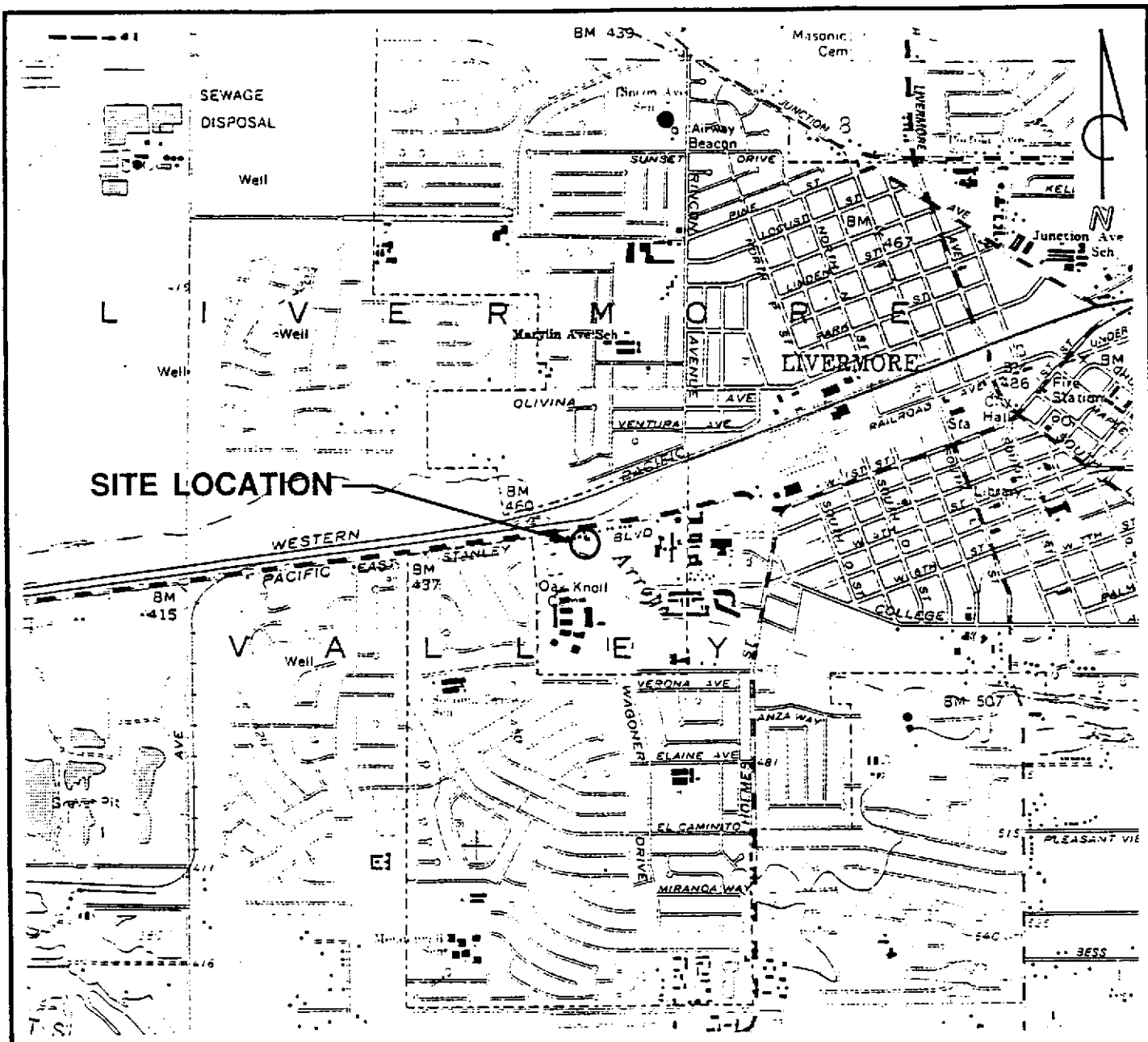
TABLE 2

Summary of Analytical Results
Volatile Organic Compounds, Semi-volatile Organic Compounds, Metals
Soil Samples from Waste Oil Tank Excavation
Results in Parts per Million - Dry Soil Basis

	WO-1	WOSW-N	Designated Level*
Volatile Organic Compounds	ND	ND	
Semi-volatile Organic Compounds			
Phenanthrene	14.	15.	28,000.
Anthracene	3.9	3.5	28,000.
Flouranthene	21.	15.	42.
Pyrene	19.	13.	28,000.
Benzo(a)anthracene	7.2	5.0	not established
Chrysene	7.2	5.0	28,000.
Benzo(b)flouranthene	4.4	ND	28,000.
Benzo(k)flouranthene	4.4	ND	28,000.
Benzo(a)pyrene	ND	3.4	28,000.
All other tested compounds	ND	ND	
Metals			
Cadmium	ND	ND	100.
Chromium	35.	61.	500.
Lead	18.	16.	500.
Zinc	36.	43.	200,000.

ND = None detected. See enclosed Certified Analytical Report for detection limits.

* = Levels to protect drinking water when compounds occur in a solid, for a hypothetical "average" site. Converted to parts per million. Source: "Water Quality Goals and Hazardous and Designated Levels for Chemical Constituents," California Regional Water Quality Control Board (prepared by Jon Marshack), September 1986.



QUADRANGLE LOCATION

REFERENCE:
USGS 7.5 MIN. TOPOGRAPHIC MAP
TITLED: LIVERMORE, CALIFORNIA
DATED: 1961 REVISED: 1980

SCALE

2000 0 2000 FEET

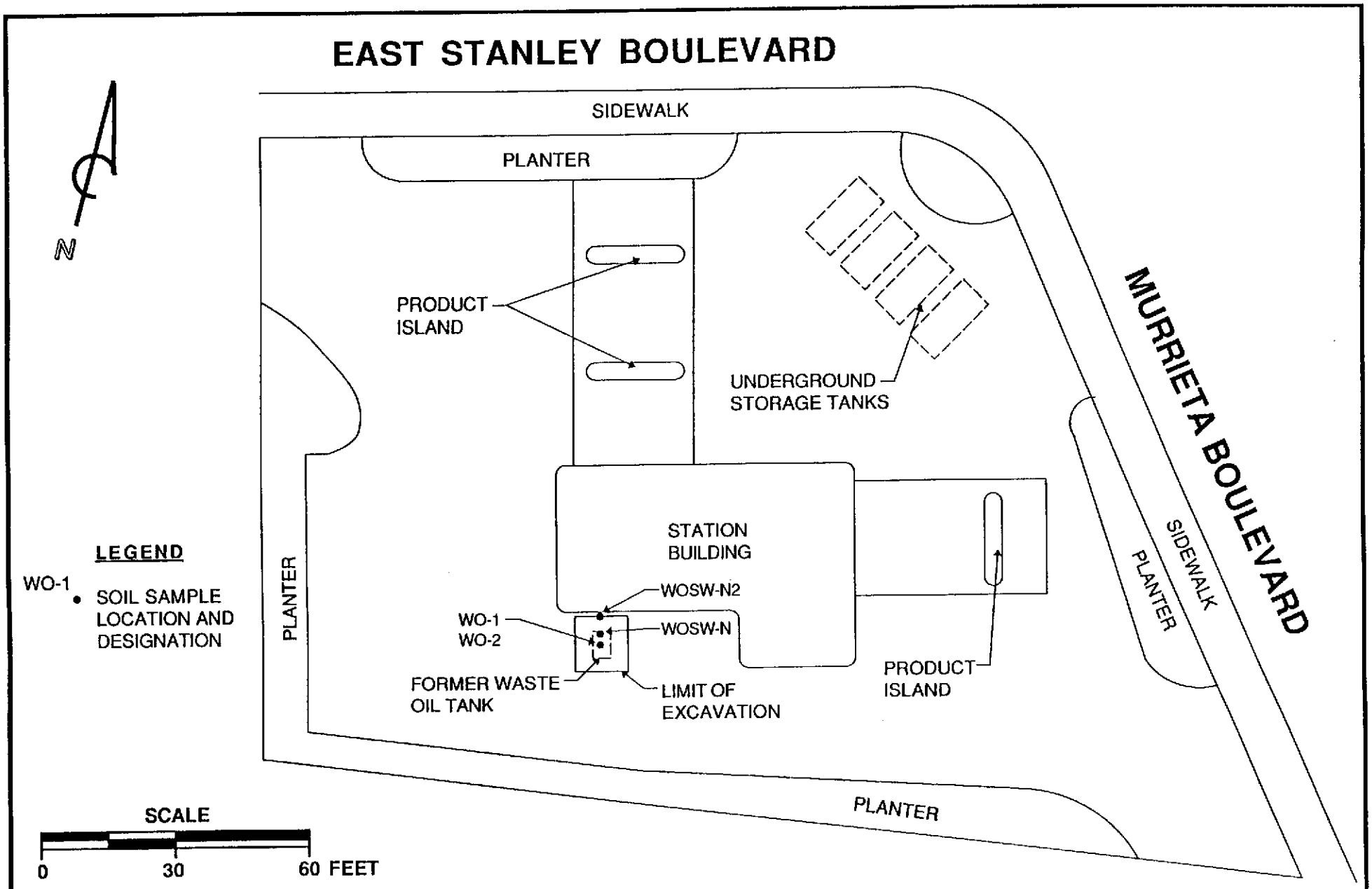
PACIFIC ENVIRONMENTAL GROUP, INC.

ARCO SERVICE STATION #6113
785 East Stanley Boulevard
Livermore, California

SITE LOCATION MAP

FIGURE: 1

PROJECT: 330-53.01



PACIFIC ENVIRONMENTAL GROUP, INC.

ARCO SERVICE STATION #6113
785 East Stanley Boulevard and Murrieta Boulevard
Livermore, California

SITE MAP

FIGURE: 2

PROJECT: 330-53.01

INTERNATIONAL
TECHNOLOGY
CORPORATION

Pacific Environmental Group, Inc.
1601 Civic Center Drive
Suite 202
Santa Clara, CA 95050

January 31, 1989

ATTN: John Adams

Following are the results of analyses on the samples described below.

Project:	330-53.01, Arco, 785 E. Stanley, Livermore
Lab Numbers:	S9-01-303-01 and S9-01-303-02
Number of Samples:	2
Sample Type:	Soil
Date Received:	1/27/89
Analyses Requested:	Metals, Low Boiling Hydrocarbons, High Boiling Hydrocarbons, Oil and Grease, E.P.A. 8240, E.P.A. 8270

Samples were analyzed for inorganic parameters following E.P.A. Protocol, using methods from SW846 3rd Edition or Methods For Chemical Analysis Of Water And Wastes 600/4-79-020. The method employed is listed adjacent to the parameter in the table.

The method of analysis for low boiling hydrocarbons is taken from EPA Methods 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector as well as a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline and includes benzene, toluene, ethyl benzene and xylenes.

The method of analysis for high boiling hydrocarbons in soil involves extracting the sample with acetone. The mixture is partitioned with hexane and the resulting extract is examined by gas chromatography using a flame ionization detector.

The method of analysis for oil and grease in soil is taken from EPA Method 3550 and Standard Methods Section 503E. The sample is extracted with repeated portions of 50:50 methylene chloride:acetone using a horn-type sonicator. The extract is dried with sodium sulfate and treated with silica gel to remove polar compounds. Following evaporation, oil and grease is determined gravimetrically.

ITAS/San Jose to
Pacific Environmental Group, Inc.
ATTN: John Adams

January 31, 1989
Page 2

The method of analysis for semi-volatile organics is taken from E.P.A. Methods 625 and 8270. Final detection is by gas chromatography/mass spectrometry.

The method of analysis for volatile organics is taken from E.P.A. Methods 624 and 8240. Water samples and low-level soil samples are analyzed directly using the purge and trap technique. Medium-level soil samples are extracted with methanol and a portion of the extract is analyzed using the purge and trap technique. Final detection is by gas chromatography/mass spectrometry.

Fred Rouse

FR/gg

10 Pages Following - Tables of Results

ITAS/San Jose to
Pacific Environmental Group, Inc.
ATTN: John Adams

January 31, 1989

Project: 330-53.01, Arco, 785 E. Stanley, Livermore

Lab Number: S9-01-303-01

Sample Identification: WO-1

Results - Milligrams per Kilogram

Parameter	E.P.A. Method	Detected	Detection Limit
Cadmium	6010	None	0.5
Chromium	6010	35.	0.5
Lead	6010	18.	3.0
Zinc	6010	36.	1.0

ITAS/San Jose to
Pacific Environmental Group, Inc.
ATTN: John Adams

January 31, 1989

Project: 330-53.01, Arco, 785 E. Stanley, Livermore

Lab Number: S9-01-303-01

Sample Identification: WO-1

Sample Date: 1/26/89

Date Analysis Completed: 1/30/89

ND = None Detected

Results
Volatile Organic Compounds
(Milligrams per Kilogram)

Compound	Detected	Detection Limit
Chloromethane	ND	0.01
Bromomethane	ND	0.01
Vinyl Chloride	ND	0.01
Chloroethane	ND	0.01
Dichloromethane (Methylene Chloride)	ND	0.005
Acetone	ND	0.01
Carbon Disulfide	ND	0.005
1,1-Dichloroethene	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethene (Total)	ND	0.005
Chloroform	ND	0.005
1,2-Dichlorethane	ND	0.005
Methyl ethyl ketone (2-Butanone)	ND	0.01
1,1,1-Trichloroethane	ND	0.005
Carbon Tetrachloride	ND	0.005
Vinyl Acetate	ND	0.01
Bromodichloromethane	ND	0.005
1,2-Dicloropropane	ND	0.005
Cis-1,3-Dichloropropene	ND	0.005
Trichloroethene	ND	0.005
Chlorodibromomethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Benzene	ND	0.005
Trans-1,3-Dichloropropene	ND	0.005
Bromoform	ND	0.005
4-Methyl-2-pentanone	ND	0.01
2-Hexanone	ND	0.01
Tetrachloroethene	ND	0.005
1,1,2,2-Tetrachloroethane	ND	0.005
Toluene	ND	0.005
Chlorobenzene	ND	0.005
Ethylbenzene	ND	0.005
Styrene	ND	0.005
Xylenes (Total)	ND	0.005

ITAS/San Jose to
Pacific Environmental Group, Inc.
ATTN: John Adams

January 31, 1989

Project: 330-53.01, Arco, 785 E. Stanley, Livermore

Lab Number: S9-01-303-01

Sample Identification: WO-1

Sample Date: 1/26/89

Date Analysis Completed: 1/30/89

ND = None Detected

Results
Semi-Volatile Organic Compounds
(Milligrams per Kilogram)

Compound	Detected	Detection Limit
Phenol	ND	3.3
Bis(2-chloroethyl)ether	ND	3.3
2-Chlorophenol	ND	3.3
1,3-Dichlorobenzene	ND	3.3
1,4-Dichlorobenzene	ND	3.3
Benzyl alcohol	ND	3.3
1,2-Dichlorobenzene	ND	3.3
2-Methylphenol	ND	3.3
Bis(2-chloroisopropyl)ether	ND	3.3
4-Methylphenol	ND	3.3
N-Nitroso-di-n-propylamine	ND	3.3
Hexachloroethane	ND	3.3
Nitrobenzene	ND	3.3
Isophorone	ND	3.3
2-Nitrophenol	ND	3.3
2,4-Dimethylphenol	ND	3.3
Benzoic acid	ND	17.
Bis(2-chloroethoxy)methane	ND	3.3
2,4-Dichlorophenol	ND	3.3
1,2,4-Trichlorobenzene	ND	3.3
Naphthalene	ND	3.3
4-Chloroaniline	ND	3.3
Hexachlorobutadiene	ND	3.3
4-Chloro-3-methylphenol	ND	3.3
2-Methylnaphthalene	ND	3.3
Hexachlorocyclopentadiene	ND	3.3
2,4,6-Trichlorophenol	ND	3.3
2,4,5-Trichlorophenol	ND	17.
2-Chloronaphthalene	ND	3.3
2-Nitroaniline	ND	17.
Dimethylphthalate	ND	3.3
Acenaphthylene	ND	3.3
3-Nitroaniline	ND	17.
Acenaphthene	ND	3.3
2,4-Dinitrophenol	ND	17.
4-Nitrophenol	ND	17.
Dibenzofuran	ND	3.3

ITAS/San Jose to
Pacific Environmental Group, Inc.
ATTN: John Adams

January 31, 1989

Project: 330-53.01, Arco, 785 E. Stanley, Livermore

Lab Number: S9-01-303-01

Sample Identification: WO-1

Sample Date: 1/26/89

Date Analysis Completed: 1/30/89

ND = None Detected

Results (continued)
Semi-Volatile Organic Compounds
(Milligrams per Kilogram)

Compound	Detected	Detection Limit
2,4-Dinitrotoluene	ND	3.3
2,6-Dinitrotoluene	ND	3.3
Diethylphthalate	ND	3.3
4-Chlorophenylphenyl ether	ND	3.3
Fluorene	ND	3.3
4-Nitroaniline	ND	17.
4,6-Dinitro-o-cresol	ND	17.
N-Nitrosodiphenylamine	ND	3.3
4-Bromophenyl-phenyl ether	ND	3.3
Hexachlorobenzene	ND	3.3
Pentachlorophenol	ND	17.
Phenanthrene	14.	3.3
Anthracene	3.9	3.3
Di-n-butylphthalate	ND	3.3
Fluoranthene	21.	3.3
Pyrene	19.	3.3
Butylbenzylphthalate	ND	3.3
3,3'-Dichlorobenzidine	ND	6.7
Benzo(a)anthracene	7.2	3.3
Bis(2-ethylhexyl)phthalate	ND	3.3
Chrysene	7.2	3.3
Di-n-octylphthalate	ND	3.3
Benzo(b)fluoranthene	4.4	3.3
Benzo(k)fluoranthene	4.4	3.3
Benzo(a)pyrene	ND	3.3
Indeno-(1,2,3-c,d,)pyrene	ND	3.3
Dibenzo(a,h)anthracene	ND	3.3
Benzo(g,h,i)perylene	ND	3.3
N-Nitrosodimethylamine	ND	3.3
1,2-Diphenylhydrazine	ND	3.3
Benzidine	ND	3.3

ITAS/San Jose to
Pacific Environmental Group, Inc.
ATTN: John Adams

January 31, 1989

Project: 330-53.01, Arco, 785 E. Stanley, Livermore

Lab Number: S9-01-303-01
Sample Identification: WO-1

	Results		
	Milligrams per Kilogram (dry soil basis)		
Total Petroleum Hydrocarbons	Detected	Detection Limit	Calculated as
Low Boiling Hydrocarbons	None	5.	Gasoline
Benzene	None	0.05	—
Toluene	None	0.1	—
Ethyl benzene	None	0.1	—
Xylenes	None	0.3	—
High Boiling Hydrocarbons	160.*	10.	Diesel
High Boiling Hydrocarbons	60.	60.	Oil
Oil and Grease	660.	10.	—

*Chromatographic pattern of compounds detected and calculated as diesel does not match that of the diesel standard used for calibration.

ITAS/San Jose to
Pacific Environmental Group, Inc.
ATTN: John Adams

January 31, 1989
Page 6 of 10

Project: 330-53.01, Arco, 785 E. Stanley, Livermore

Lab Number: S9-01-303-02

Sample Identification: WOSW-N

Results - Milligrams per Kilogram

Parameter	E.P.A. Method	Detected	Detection Limit
Cadmium	6010	None	0.5
Chromium	6010	61.	0.5
Lead	6010	16.	3.0
Zinc	6010	43.	1.0

ITAS/San Jose to
Pacific Environmental Group, Inc.
ATTN: John Adams

January 31, 1989

Project: 330-53.01, Arco, 785 E. Stanley, Livermore

Lab Number: S9-01-303-02

Sample Identification: WOSW-N

Sample Date: 1/26/89

Date Analysis Completed: 1/30/89

ND = None Detected

Results
Volatile Organic Compounds
(Milligrams per Kilogram)

Compound	Detected	Detection Limit
Chloromethane	ND	0.01
Bromomethane	ND	0.01
Vinyl Chloride	ND	0.01
Chloroethane	ND	0.01
Dichloromethane (Methylene Chloride)	ND	0.005
Acetone	ND	0.01
Carbon Disulfide	ND	0.005
1,1-Dichloroethene	ND	0.005
1,1-Dichloroethane	ND	0.005
1,2-Dichloroethene (Total)	ND	0.005
Chloroform	ND	0.005
1,2-Dichlorethane	ND	0.005
Methyl ethyl ketone (2-Butanone)	ND	0.01
1,1,1-Trichloroethane	ND	0.005
Carbon Tetrachloride	ND	0.005
Vinyl Acetate	ND	0.01
Bromodichloromethane	ND	0.005
1,2-Dicloropropane	ND	0.005
Cis-1,3-Dichloropropene	ND	0.005
Trichloroethene	ND	0.005
Chlorodibromomethane	ND	0.005
1,1,2-Trichloroethane	ND	0.005
Benzene	ND	0.005
Trans-1,3-Dichloropropene	ND	0.005
Bromoform	ND	0.005
4-Methyl-2-pentanone	ND	0.01
2-Hexanone	ND	0.01
Tetrachloroethene	ND	0.005
1,1,2,2-Tetrachloroethane	ND	0.005
Toluene	ND	0.005
Chlorobenzene	ND	0.005
Ethylbenzene	ND	0.005
Styrene	ND	0.005
Xylenes (Total)	ND	0.005

ITAS/San Jose to
Pacific Environmental Group, Inc.
ATTN: John Adams

January 31, 1989

Project: 330-53.01, Arco, 785 E. Stanley, Livermore

Lab Number: S9-01-303-02

Sample Identification: WOSW-N

Sample Date: 1/26/89

Date Analysis Completed: 1/30/89

ND = None Detected

Results
Semi-Volatile Organic Compounds
(Milligrams per Kilogram)

Compound	Detected	Detection Limit
Phenol	ND	3.3
Bis(2-chloroethyl)ether	ND	3.3
2-Chlorophenol	ND	3.3
1,3-Dichlorobenzene	ND	3.3
1,4-Dichlorobenzene	ND	3.3
Benzyl alcohol	ND	3.3
1,2-Dichlorobenzene	ND	3.3
2-Methylphenol	ND	3.3
Bis(2-chloroisopropyl)ether	ND	3.3
4-Methylphenol	ND	3.3
N-Nitroso-di-n-propylamine	ND	3.3
Hexachloroethane	ND	3.3
Nitrobenzene	ND	3.3
Isophorone	ND	3.3
2-Nitrophenol	ND	3.3
2,4-Dimethylphenol	ND	3.3
Benzoic acid	ND	17.
Bis(2-chloroethoxy)methane	ND	3.3
2,4-Dichlorophenol	ND	3.3
1,2,4-Trichlorobenzene	ND	3.3
Naphthalene	ND	3.3
4-Chloroaniline	ND	3.3
Hexachlorobutadiene	ND	3.3
4-Chloro-3-methylphenol	ND	3.3
2-Methylnaphthalene	ND	3.3
Hexachlorocyclopentadiene	ND	3.3
2,4,6-Trichlorophenol	ND	3.3
2,4,5-Trichlorophenol	ND	17.
2-Chloronaphthalene	ND	3.3
2-Nitroaniline	ND	17.
Dimethylphthalate	ND	3.3
Acenaphthylene	ND	3.3
3-Nitroaniline	ND	17.
Acenaphthene	ND	3.3
2,4-Dinitrophenol	ND	17.
4-Nitrophenol	ND	17.
Dibenzofuran	ND	3.3

ITAS/San Jose to
Pacific Environmental Group, Inc.
ATTN: John Adams

January 31, 1989

Project: 330-53.01, Arco, 785 E. Stanley, Livermore

Lab Number: S9-01-303-02

Sample Identification: WOSW-N

Sample Date: 1/26/89

Date Analysis Completed: 1/30/89

Results (continued)
Semi-Volatile Organic Compounds
(Milligrams per Kilogram)

ND = None Detected

Compound	Detected	Detection Limit
2,4-Dinitrotoluene	ND	3.3
2,6-Dinitrotoluene	ND	3.3
Diethylphthalate	ND	3.3
4-Chlorophenylphenyl ether	ND	3.3
Fluorene	ND	3.3
4-Nitroaniline	ND	17.
4,6-Dinitro-o-cresol	ND	17.
N-Nitrosodiphenylamine	ND	3.3
4-Bromophenyl-phenyl ether	ND	3.3
Hexachlorobenzene	ND	3.3
Pentachlorophenol	ND	17.
Phenanthrene	15.	3.3
Anthracene	3.5	3.3
Di-n-butylphthalate	ND	3.3
Fluoranthene	15.	3.3
Pyrene	13.	3.3
Butylbenzylphthalate	ND	3.3
3,3'-Dichlorobenzidine	ND	6.7
Benzo(a)anthracene	5.0	3.3
Bis(2-ethylhexyl)phthalate	ND	3.3
Chrysene	5.0	3.3
Di-n-octylphthalate	ND	3.3
Benzo(b)fluoranthene	ND	3.3
Benzo(k)fluoranthene	ND	3.3
Benzo(a)pyrene	3.4	3.3
Indeno-(1,2,3-c,d,)pyrene	ND	3.3
Dibenzo(a,h)anthracene	ND	3.3
Benzo(g,h,i)perylene	ND	3.3
N-Nitrosodimethylamine	ND	3.3
1,2-Diphenylhydrazine	ND	3.3
Benzidine	ND	3.3

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January 31, 1989

Project: 330-53.01, Arco, 785 E. Stanley, Livermore

Lab Number: S9-01-303-02
Sample Identification: WOSW-N

Results

Total Petroleum Hydrocarbons	Milligrams per Kilogram (dry soil basis) Detected	Detection Limit	Calculated as
Low Boiling Hydrocarbons	None	5.	Gasoline
Benzene	None	0.05	--
Toluene	None	0.1	--
Ethyl benzene	None	0.1	--
Xylenes	None	0.3	--
High Boiling Hydrocarbons	490.*	30.	Diesel
High Boiling Hydrocarbons	790.	200.	Oil
Oil and Grease	1,700.	10.	--

*Chromatographic pattern of compounds detected and calculated as diesel does not match that of the diesel standard used for calibration.

INTERNATIONAL TECHNOLOGY CORPORATION

Pacific Environmental Group, Inc.
1601 Civic Center Drive
Suite 202
Santa Clara, CA 95050

February 8, 1989

ATTN: John Adams

Following are the results of analyses on the samples described below.

Project:	330-53.01, E. Stanley, Livermore
Lab Numbers:	S9-02-077-01 and S9-02-077-02
Number of Samples:	2
Sample Type:	Soil
Date Received:	2/6/89
Analyses Requested:	High Boiling Hydrocarbons, Oil and Grease

The method of analysis for high boiling hydrocarbons in soil involves extracting the sample with acetone. The mixture is partitioned with hexane and the resulting extract is examined by gas chromatography using a flame ionization detector.

The method of analysis for oil and grease in soil is taken from EPA Method 3550 and Standard Methods Section 503E. The sample is extracted with repeated portions of 50:50 methylene chloride:acetone using a horn-type sonicator. The extract is dried with sodium sulfate and treated with silica gel to remove polar compounds. Following evaporation, oil and grease is determined gravimetrically.

ND = None Detected

Results

		Milligrams per Kilogram - Dry Soil Basis		
Lab Number	Sample Identification	High Boiling Hydrocarbons (calculated as diesel)	High Boiling Hydrocarbons (calculated as oil)	Oil & Grease
S9-02-077-01	WOSW-N2	30.*	800.	1,100.
Detection Limit		30.	200.	10.
S9-02-077-02	WO-2	ND	ND	ND
Detection Limit		10.	10.	10.

*Chromatographic pattern of compounds detected and calculated as diesel does not match that of the diesel standard used for calibration.

FR/gg

Fred Rouse

SAMPLING/ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

785 E. STANLEY, LIVERMORE

Project No.: 330-53.01 Requested By: JBA P.O. No.: 10562

REQUEST		LABORATORY REQUIREMENTS					CHAIN OF CUSTODY				
SAMPLE TYPE: SOIL		CONTAINERS					SAMPLER'S SIGNATURE		CONTRACT LABORATORY		
SAMPLE I.D.	PARAMETERS	SIZE/TYPE	QUANTITY	PRES.	LAB	DUE DATE	SAMPLER	SAMPLE DATE	REC'D BY	COMMENTS	DATE REC'D
WO-1	8240, 8270, TPH (G+D) Cr Cd Pb Zn Oil & Grease	2" BRASS Ring	1	NP	ET	1/30/89	JPA	1/26/89	J.P.	ok Cool	1/27/89
WOSW-N	↓	↓	↓	↓	↓	↓	↓	↓	1	1	1

SIGNATURES:

RELEASED BY: _____ RECEIVED BY: _____ RELEASED BY: _____ RECEIVED BY: _____

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1/27/89 1615

Josephine DeCarli 1/27/89 16.26

PACIFIC ENVIRONMENTAL GROUP, INC.

SAMPLING/ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Project No.: 330-57.01 Requested By: JBA P.O. No.: 10610

REQUEST		LABORATORY REQUIREMENTS					CHAIN OF CUSTODY				
SAMPLE TYPE: SOIL		CONTAINERS					SAMPLER'S SIGNATURE		CONTRACT LABORATORY		
SAMPLE I.D.	PARAMETERS	SIZE/TYPE	QUANTITY	PRES.	LAB	DUE DATE	SAMPLER	SAMPLE DATE	REC'D BY	COMMENTS	DATE REC'D
WOSW-N2	HBA, Oil+Grease	2" BRASS Ring	1	NP	IT	2/8/89	JBA	2/3/89	J.D.	ok Cool	2/6/89
WO-2	↓ ↓	↓	↓	↓	↓	↓	↓	↓	1	1	1

SIGNATURES:

RELEASED BY: _____ RECEIVED BY: _____ RELEASED BY: _____ RECEIVED BY: _____

RELEASED BY: _____ RECEIVED BY: _____

RELEASED BY: _____ RECEIVED BY: _____ RELEASED BY: [signature] 2/4/89 1115

RECEIVED BY LAB: Josephine DeCarli 2/6/89 11:16

PACIFIC ENVIRONMENTAL GROUP, INC.