10-13-89

WEISS ASSOCIATES Consulting in Geology & Geohydrology
2938 McClure Street, Oakland, CA 94609 415-465-1100

October 13, 1989

10/23/89

ALAMEDA COUNTY
DEPT. OF ENVIRONMENTAL HEALTH
HAZARDOUS MATERIALS

Ms. Wendy Howell
Shell Oil Company
P.O. Box 4848
Anaheim, CA 92803

Re: Shell Service Station
WIC #204-007-205
2160 Otis Drive
Alameda, California
WA Job #81-429-02

Dear Ms. Howell:

This letter is submitted to document the June 1987 removal of a former waste oil tank at the subject station and how it complies with the tank closure requirements of the California Regional Water Quality Control Board-San Francisco Bay Region (WQCB) and California Administrative Code Title 23 Waters, Chapter 3, Subchapter 16, Article 7.

Summarized below are previous and current data, including the site background, a site history, discussion of site and regional hydrogeologic conditions, descriptions of past and current tank closure requirements, and recommendations for achieving closure of the former waste oil tank excavation.

BACKGROUND

The subject station is located in the city of Alameda, about 1,000 ft east of San Francisco Bay, on the south side of Otis Drive between Willow and Park Streets. The operating station retails gasoline from three 10,000 gallon fiberglass storage tanks located in the eastern portion of the site adjacent to Otis Drive. The former waste oil tank was buried immediately southwest of the station building. A site map showing the location of the former waste oil tank is presented as Attachment A.

SITE HISTORY SUMMARY

Shell Oil Company records indicate that a steel 550-gallon waste oil tank was removed from the site in June 1987 by Petroleum Engineering, of Santa Rosa, California, and was replaced with a 550-gallon fiberglass tank. The steel tank was apparently installed in 1975.

Following the tank removal, Blaine Tech Services of San Jose, California collected a soil sample from directly beneath the former tank location at 7 ft depth, a soil sample from the excavation sidewall at 3.5 ft depth, a sample of the groundwater in the tank pit, and samples of stockpiles of soil excavated from the tank pit. The water and native soil samples were submitted to Sequoia Analytical Laboratory of Redwood City, California (Sequoia). The Sequoia analytic methods and results are presented in Table 1. Although this sample contained 1,700 ppm TOG, no TPH or volatile organic compounds (VOCs) were detected. The sidewall soil sample contained 47 ppm TOG. TOG was not detected in the water sample.

Observations made by Blaine Tech personnel indicate that the tank had a tar wrapping, and that both the tank and wrapping appeared to be in good condition, with no holes. Blaine Tech field notes and sampling report are presented as Attachment B. Sequoia Laboratory analytic reports are included in the sampling report.

Based on the analytic results for the tank removal soil samples, in September 1987 Pacific Environmental Group of Santa Clara, California (PEG), conducted a subsurface investigation to determine whether hydrocarbons were in ground water beneath the site. The investigation consisted of drilling one soil boring to a depth of 20.5 ft, installing a ground water monitoring well in the boring, and analyzing soil and ground water samples. The boring was drilled adjacent to the southwest side of the waste oil tank pit. Ground water was encountered in the borehole at about 8 ft depth and stabilized in the monitoring well at about 5 ft. Soil samples collected from the boring at depths of about 5, 10, 15 and 20 ft were submitted by PEG to International Technology Corporation of Santa Clara, California (IT) for analysis. IT analytic methods and results for soil are included in Table 1.

TABLE 1. Analytic Results for Soil and Ground Water, Shell Service Station WIC #204-007-205, 2160 Otis Drive, Alameda, California

Sample ID	Depth ft	Date Sampled	Sampled By	Analytic Lab	Analytic Method	TPH-G	TPH-D	TPH-O/JF	BETX	TOG	PCBs	VOCs	SVOCs	Metals
						<----------parts per million---------->								
Excavation Soil #2	7	6-15-87	BT	SAL	3550/503E/8015/ 8010/8020	NA	<1.0	NA	<0.050	1,700	NA	ND[1]	NA	NA
Excavation Soil #3	3.5	6-15-87	BT	SAL	3550/503E	NA	NA	NA	NA	47	NA	NA	NA	NA
Excavation Water	-	6-15-87	BT	SAL	3550/503E	NA	NA	NA	NA	<5	NA	NA	NA	NA
Soil Boring Soil #S1-1	5	9-04-87	PEG	IT	3550/503E/8015	NA	<35	385	NA	1,600	NA	NA	NA	NA
Soil Boring Soil #S1-2	10	9-04-87	PEG	IT	8240/3550/ 503E/8015	NA	<10	108	<0.005	460	NA	ND[1]	NA	NA
Soil Boring Soil #S1-3	15	9-04-87	PEG	IT	3550/503E/8015	NA	<10	16	NA	70	NA	NA	NA	NA
Soil Boring Soil #S1-4	20	9-04-87	PEG	IT	3550/503E/8015	NA	<10	87	NA	320	NA	NA	NA	NA
S-1	-	9-04-87	PEG	IT	624	NA	NA	NA	<0.005	NA	NA	1*	NA	NA
S-1	-	9-11-89	WA	IT	8015/8020/503E 624/8270/6010	<0.05	<1.0	NA	ND[2]	<1.0	<0.5	ND[1]	ND[1]	2*

TABLE 1. Analytic Results for Soil and Ground Water, Shell Service Station WIC #204-007-204, 2160 Otis Drive, Alameda, California (continued)

Abbreviations

TPH-G = Total Petroleum Hydrocarbons as Gasoline
TPH-D = Total Petroleum Hydrocarbons as Diesel
TPH-O/JF = Total Petroleum Hydrocarbons as Oil and Jet Fuel
B = Benzene
E = Ethylbenzene
T = Toluene
X = Xylenes
TOG = Total Oil and Grease
VOCs = Volatile Organic Compounds
NA = Not Analyzed
BT = Blaine Tech Services, San Jose, California
PEG = Pacific Environmental Group Inc., Santa Clara, California
WA = Weiss Associates
SEQ = Sequoia Analytical Labs, Redwood City, California
IT_1 = International Technology Corp., Santa Clara, California
ND^1 = Not detected at detection limits between 0.005 and 0.05 ppm
ND^2 = Not detected at detection levels between 0.0005 and 0.0003 ppm

Footnotes

1* = Unknown Alcohol detected at 0.007 ppm, and Acetone detected at .27 ppm
2* = Chronium, Lead and Zinc detected at 0.09 ppm, 0.09 ppm and 0.10 ppm, respectively

Analytic Methods

3550 = EPA Method 3550, Sonification Extraction
503E = American Public Health Association Standard Method 503E, Gravimetric Quantitation
8015 = EPA Method 8015, Gas Chromatography with Flame Ionization Detection
8010 = EPA Method 8010, Gas Chromatography with Hall Detection
8020 = EPA Method 8020, Gas Chromatography with Photo Ionization Detection
8240 = EPA Method 8240, Gas Chromatography Mass Spectroscopy (GC/MS)
624 = EPA Method 624, Purge and Trap - GC/MS
8270 = EPA Method 8270, Gas Chromotography/Mass Spectrosopy
6010 = Inductively Coupled Plasma Spectrosocopy (ICP)

A ground water sample from monitoring well S-1 was also analyzed by IT. The IT analytic methods and results for ground water are also included in Table 1. Acetone was detected in the sample at 0.27 ppm, and an unknown alcohol was detected at .007 ppm. The PEG investigation report is presented as Attachment C.

To confirm the absence of hydrocarbons in groundwater and to determine whether the acetone detected in the initial water sample could have been the results of laboratory contamination, on September 11, 1989, WA environmental technician Todd Pearson collected ground water samples from well S-1, and submitted them for analysis at IT. At this time, the depth to water in the monitoring well was about 4.3 ft.

Analytic results and methods are presented in Table 1, and laboratory analytic reports and chain of custody documents are presented as Attachment D. Chromium, lead and zinc were detected in ground water at concentrations of 0.09 ppm, 0.09 ppm and 0.10 ppm, respectively. Hydrocarbons, PCB's, volatile organics and semi-volatile organics were not detected in the ground water. Acetone and alcohol, present in the ground water samples from September 1987, were not detected in the recent samples. Therefore, it is likely that the previous results were caused by laboratory contamination.

SITE HYDROGEOLOGIC CONDITIONS

To estimate the stratigraphy, ground water flow direction and the approximate ground water depth in the site vicinity WA:

- Observed neighboring sites and reviewed local and state agency files to determine whether any water wells were nearby,
- Researched local and regional hydrogeologic data, and
- Measured depth-to-water in the existing well.

Results of this work indicate:

- There are no water wells in the immediate site vicinity other than the one ground water monitoring well on Shell property, adjacent to the site of the former waste oil tank.

    - Review of Alameda County Flood Control and Water Conservation District (Zone 7) driller's report files indicate 40 wells within one-half mile of the subject site.

    - Based on water level data obtained from Zone 7 driller's report files, the California Department of Water Resources (DWR), the WQCB, the PEG report for the subject site, and recent measurements by WA, unconfined ground water in the upper water-bearing zone occurs at a depth of between 4 and 5 ft directly beneath the site. Ground water gradient information for the upper water-bearing zone in the vicinity of the site is not available. The flow direction in the deeper regional water-bearing zone is to the west-southwest.[1]

    - The PEG well log for the boring drilled on the subject property indicates that the site is underlain by sand and silty sand, with thin interbeds of silt, to a depth of at least 20.5 ft. According to the 1988 Zone 7 report cited above, these sediments are associated with the Merritt Sand, an unconsolidated unit made up of beach and near-shore deposits. The Merritt Sand contains some groundwater, but is not considered a primary source of supply because of its limited areal extent and thickness. The main water-bearing unit is a thick Pleistocene alluvial deposit that extends beneath the entire East Bay Plain area.

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[1] Alameda County Flood Control and Water Conservation District, 1988, Geohydrology and Groundwater - Quality Overview, East Bay Plain Area, Alameda County, California, 205(J) Report, 83 pp. and 6 appendices.

CLOSURE REQUIREMENTS

A 1985 San Francisco Bay Region WQCB tank removal and fuel leak guidance document[2] requires documentation of the integrity of the tank and tank piping, the condition of the tank excavation, collection of soil samples beneath the tank, and analysis of the samples for hydrocarbons. This document requires monitoring well installation only if greater than 100 ppm hydrocarbons are detected in the soil samples, but does not specifically address waste oil tank removals.

According to a June 7, 1988, WQCB guidance document (Revised, May 1989) if greater than 100 ppm hydrocarbons are detected in soil samples from beneath the tank or hydrocarbons are detected in groundwater or in soil below the seasonal high groundwater level, then a soil and/or groundwater investigation is required.[3] At least one well in the downgradient direction from the tank is required for the ground water investigation.

The 1988 WQCB guidance document also requires specific EPA-approved chemical analyses of soil and/or ground water samples collected during tank removal. For waste oil tanks, required analyses include gasoline and diesel-range hydrocarbons as well as chlorinated hydrocarbons, benzene, ethylbenzene, toluene and xylenes (BETX), oil and grease, selected metals and, in some cases, semi-volatile organics including polychlorinated biphenols (PCBs).

SITE STATUS WITH RESPECT TO CLOSURE REQUIREMENTS

The results of the current and previous work at the site and WA's hydrogeologic research indicate:

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[2] Eisenberg, D.M., A.W. Olivieri, et al., September 1985, Guidelines for Addressing Fuel Leaks, California Regional Water Quality Control Board - San Francisco Bay Region; 24 pp and 3 appendices.

[3] North Coast, San Francisco Bay and Central Valley Regional Water Quality Control Boards, June 2, 1988, (Revised May 1989), Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks, 18 pp.

- TOG above 1,000 ppm was detected in soil directly beneath the former waste oil tank location. Soil from a boring drilled adjacent to the former tank pit contained over 1,000 ppm TOG, and over 100 ppm TPH as oil and jet fuel.

- Ground water from the tank excavation contained no detectable hydrocarbons. Ground water samples collected from monitoring well S-1 on September 4, 1987, contained no detectable BETX, but contained 0.27 ppm acetone and 0.007 ppm alcohol, probably as a result of laboratory cross-contamination. However, ground water samples collected from well S-1 on September 11, 1989, were analyzed for the full range of compounds specified in the 1988 WQCB regulations, and contained no detectable hydrocarbons, PCB's, or other semi-volatile or volatile compounds, but did contain low concentrations of chromium, lead and zinc.

- The tank and tank wrapping were in good condition, with no visible holes, when the tank was removed.

- The groundwater depth water directly beneath the site was about 4.5 ft on September 11, 1989, and was about 5.0 ft in September 1987.

- Although the specific ground water flow direction in the upper water-bearing zone beneath the site is uncertain, the regional ground water flow is to the southwest. This, and the location of the site about 1,000 east of San Francisco Bay, suggests that the groundwater flow direction beneath the site is probably southwest. Monitoring well S-1, directly southwest of the tank excavation, is therefore most likely located downgradient of the former waste oil tank location.

- The site is underlain by sand and silty sand, interbedded with thin layers of silt. These sediments are not part of the main regional aquifer.

Based on these site characteristics, the tank condition, the analytic results for the ground water samples from well S-1, and the tank closure requirements existing at the time of excavation, we recommend that Shell Oil apply for closure of the former waste oil tank excavation by submitting this report to the following agencies:

Alameda County Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, California 94621
Attn: Mr. Edgar Howell

California Regional Water Quality Control Board - San Francisco Bay Region
1111 Jackson Street
Oakland, California 94607
Attn: Mr. Lester Feldman

We are pleased to provide hydrogeologic consulting services to Shell Oil and trust this submittal meets your needs. Please call if you have any questions or comments.

REGISTERED GEOLOGIST
RICHARD B. WEISS
No. EG 1112
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Sincerely,
Weiss Associates,

Joseph P. Theisen
Project Geologist
by KCS

Richard B. Weiss
Principal Hydrogeologist

JPT/RBW:ag

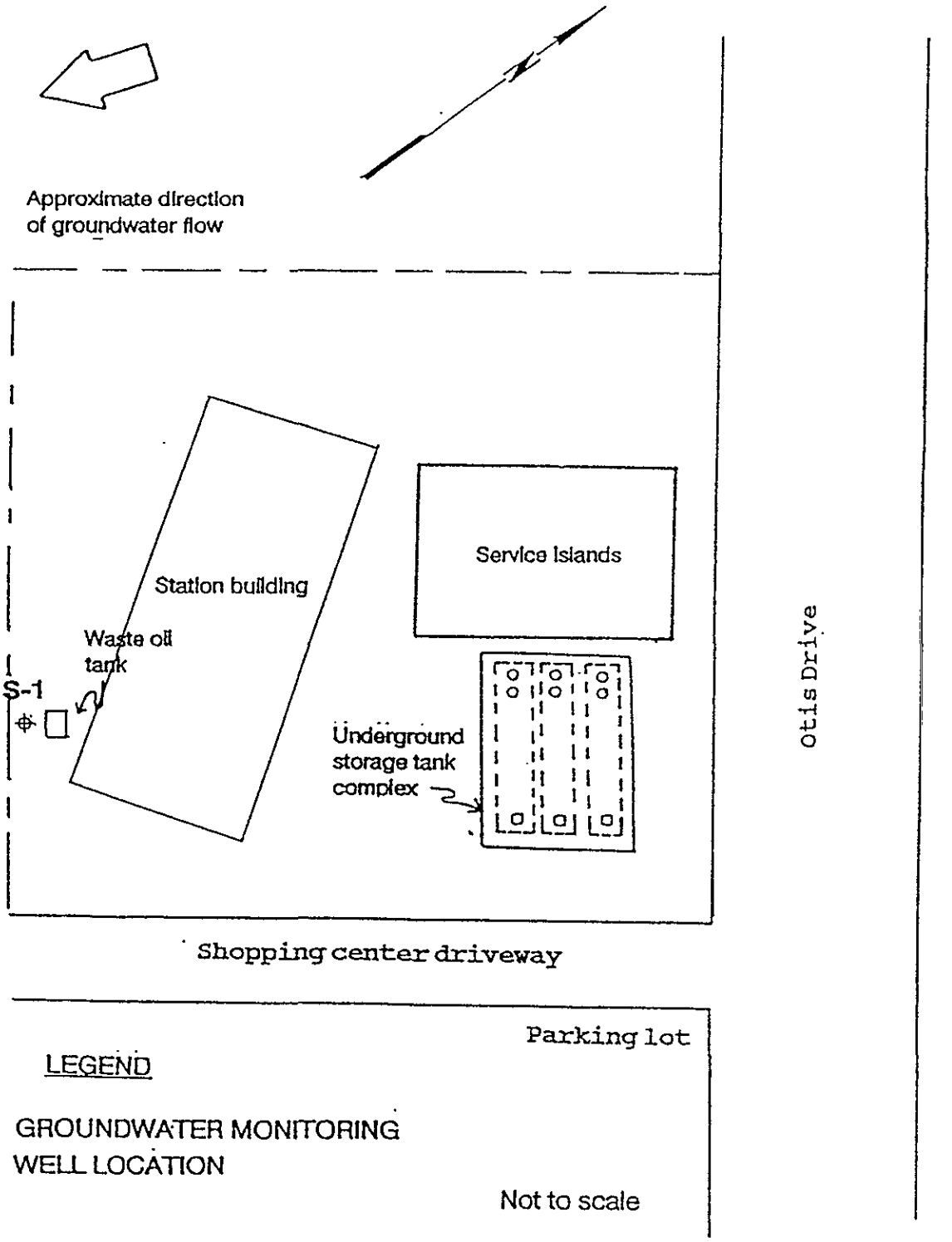
F:\ALL\SHELL\429L1OC9.WP

Enclosures: Attachment A - Site Map
Attachment B - Blaine Tech Services field notes and Sampling Report
Attachment C - PEG Subsurface Investigation Report
Attachment D - IT Analytic Reports and Chain-of-Custody

ATTACHMENT A

SITE MAP

(*from* Pacific Environmental Group
Subsurface Investigation Report,
Shell Service Station,
2160 Otis Drive, Alameda, CA,
6 pp. and 2 attachments)



PACIFIC ENVIRONMENTAL GROUP, INC.

Shell Service Station
2160 Otis Drive
Alameda, California

SITE PLAN

FIGURE
1
PROJECT NO.
100-85.01

ATTACHMENT B

BLAINE TECH SERVICES FIELD NOTES AND SAMPLING REPORT

BLAINE
TECH SERVICES INC.

1370 TULLY RD., SUITE 505
SAN JOSE, CA 95122
(408) 995-5535

June 26, 1989

Shell Oil Company
P.O. Box 4848
511 North Brookhurst Street
Anaheim, CA 92803

Attn: Peter J. Pugnale
Area Engineer--Environmental
Western Distribution Area

SITE:
Shell Service Station
2160 Otis
Alameda, Califronia

PROJECT:
Archival search for previously unpublished notes made during waste oil tank removal related sampling on

June 6, 1987 Sampling Report 87165-T-1

DOCUMENT PACKAGE 87165-T-1.ADD

Blaine Tech Services Inc. is an independent third party that performs tank removal sampling, groundwater monitoring well sampling and grab sampling services throughout central and northern California. The scope of services is intentionally limited to those that provide objective information. Unlike consulting/remediation vendors who have a complete battery of related investigation, evaluation, and remediation services which they hope to use, Blaine Tech Services, Inc. is only in the business of supplying high quality sampling and documentation. In order to preserve the objectivity necessary for the proper and impartial performance of this work and avoid implicit conflicts of interest, Blaine Tech Services, Inc. does not participate in the interpretation of analytical results or engage in the marketing of remediation systems of any kind.

LIMITATIONS

This information was compiled in response to your request for any additional and potentially useful unpublished notes made by our personnel during the waste oil tank removal project. In order to give an unfragmented presentation, we have assembled a package of *all* the applicable information. The previously unpublished notations are presented along with any existing photographs of the work in progress, followed by a complete reproduction of the original Sampling Report, the chain of custody, and the certified analytical laboratory reports.

Please bear in mind that the present search of our files is a separate scope of work from the original tank removal sampling which was completed with the issuance of our Sampling Report 87165-T-1. It is prudent to remember that this new work carries with it the usual dangers that are inherent in all archival research. In particular, there are two distinct problems that will impede any attempt to make substantive use of the informal notes which have been drawn from our files.

> First, the unpublished information was considered, at the time of its collection, to be ancillary to the core information issued in the formal Sampling Report. After so much time has elapsed it would be difficult to justify elevating those casual contemporaneous notations to a more authoritive status.
>
> Second, the information contained in those casual notes was not collected in a formal and systematic fashion that would allow all parties to have a high degree of confidence that the notes accurately represent *all* the conditions at the site which may now (after several years) be deemed important. In this regard, the primary skepticism that must be applied to the information is not that it is, necessarily, inaccurate but that it *is*, necessarily, incomplete.

These limitations suggest that the previously unpublished notations will mainly be of use in corroborating information available from other sources (such as the already issued reports), but will probably not alter the ranking of the site established by laboratory results and accepted regulatory criteria. These constraints should be taken into account when requesting archival searches and, especially, when evaluating the utility of the unpublished information in relationship to the cost of obtaining it.

BACKGROUND

Blaine Tech Services, Inc. was contacted to perform the collection of samples at this site, and to transport the samples to a state licensed laboratory. The brief report that was subsequently issued followed the standard short form format being used by our firm at that time. Though sparse by contemporary standards, this abbreviated report format had been developed at the request of the RWQCB and was used as a model by several San Francisco Bay area regulatory agencies.

Hired primarily to perform sampling (rather than documenting the entire sequence of events involved in the tank removal process), our personnel directed their documentation efforts mainly to establishing and recording the location from which the sample material was collected. Other data was collected as it was available and as our personnel had time to record it. QC work was directed to verifying the correctness of information in the written reports and did not address the casual notes and comments entered into the file by our field personnel.

ADDITIONAL NOTES ON SAMPLING EVENT 87165-T-1

Waste oil tank removal sampling June 6, 1989

Shell engineer Ray Newsome was in charge of the work. However, work at the site was organized and coordinated by Crosby & Overton. Crosby & Overton made the phoned request for Blaine Tech Services, Inc. to send sampling personnel to the site.

Both the Alameda County Health Dept and the RWQCB have jurisdiction over and interest in the site, but did not send inspectors to the site. Regulatory interests were represented by Lieutenant Steve McKinley of the Alameda Fire Department who was physically present at the site. His card gives his office phone number as (415) 522-4100 extension 245.

Notations not summarized in our report include the following:

The backfill material looked wet. It had a grey coloration, and no detectable odor.

The tank was inspected. The tank had a tar wrapping which was still intact. No holes were visible.

The inspector (Lt. Steve McKinley) requested that one soil sample be taken from the center of the pit and another soil sample be taken from the sidewall.

Loose wet sand at the bottom of the pit would not allow excavation of the pit to the planned depth of 13.0'. (The precautionary excavation of the pit to a depth of 13.0' below grade was standard operation procedure at the time of this work.)

The stockpiled soil was hauled off site.

The tank was visually inspected for holes (none found) and applicable items on an RWQCB checklist were filled out by our personnel. The proper term for this checklist was the RWQCB Checklist For Soil And Groundwater Sampling During Tank Removal.

1) No entry was made regarding the review of inventory records since this was clearly outside of the scope of work being performed by Blaine Tech Services, Inc.

2) The question regarding the visual inspection of the tank was checked off as having been completed.

3) Visual inspection of the associated piping was checked off as not applicable to the work performed at the site by our personnel.

4) Visual inspection of the excavation was checked off as having been completed.

5) The question regarding collection of two soil samples from beneath each fuel tank was checked as not applicable. The LIA inspector elected to have two samples taken but one was taken from beneath the tank and the second sample was taken from the sidewall of the pit.

6) The question about whether appropriate sample handling techniques were used was answered with a yes.

7) The question regarding the collection of one soil sample from the most obviously contaminated area to be analyzed for TPH, oil/grease, and volatile organic compounds (EPA 8240) was checked off with a yes.

8) Collection of a representative sample of the representative fuel for use as a laboratory standard was checked as being not applicable.

9) The question regarding a high water table and the collection of soil samples from the sidewalls and a water sample was checked yes.

10) Preparation of a site plan was answered with a yes.

11) Submission to a certified laboratory under a chain of custody was answered with a yes.

12) No entry was made regarding the completion of an Unauthorized Release Form as that was not part of the work performed by our firm and our personnel were not informed which parties were filing the URF.

13) No entry was made in response to the question regarding which documents and notifications had been forwarded to the RWQCB.

Both Black & White photocopies and three (3) original color prints were present in the job folder. The negatives for these photos were stored separately from the job folder. The content of the photographs is as follows:

1. The photographs shows the open pit in relationship to a decorative rock wall and a portion of the station building.

2. The photograph shows the sandy backfill material being placed in a neat stockpile by the backhoe operator.

3. The photograph shows the bottom of the pit with visible signs of wall collapse and a small amount of water visible in the center of the pit.

The other pages in the job folder contain the notes and original diagrams that support the information presented in the Sampling Report. These include notes on the collection of a water sample from approximately 9.0' below grade, sampling of the stockpile at four different points with individual sample containers, and similar entries which are adequately presented in the original Sampling Report 87165-T-1.

Subsequent pages of this letter contain photocopied versions of the photographs from the site, the RWQCB tank removal checklist and the full text of our original Sampling Report 87165-T-1.

PHOTOGRAPHS (3 COLOR PRINTS)

ORIGINAL SAMPLING REPORT 87165-T-1 page 1

June 25, 1987

Shell Oil Company
P.O. Box 4023
Lafayette, CA 94524

Attention: Ray Newsome

Re: Field sampling at

SHELL STATION
2160 OTIS
ALAMEDA, CA

JUNE 15, 1987

SAMPLING REPORT

Field sampling was undertaken in accordance with State and local enforcement agency standards and requirements for objective analytical information on the levels of residual contaminants found outside the primary containment structure. This project concerned the following:

Underground storage tank removal

Reason for removal -- replacement with double containment tank

Type -- one 550 gallon waste oil

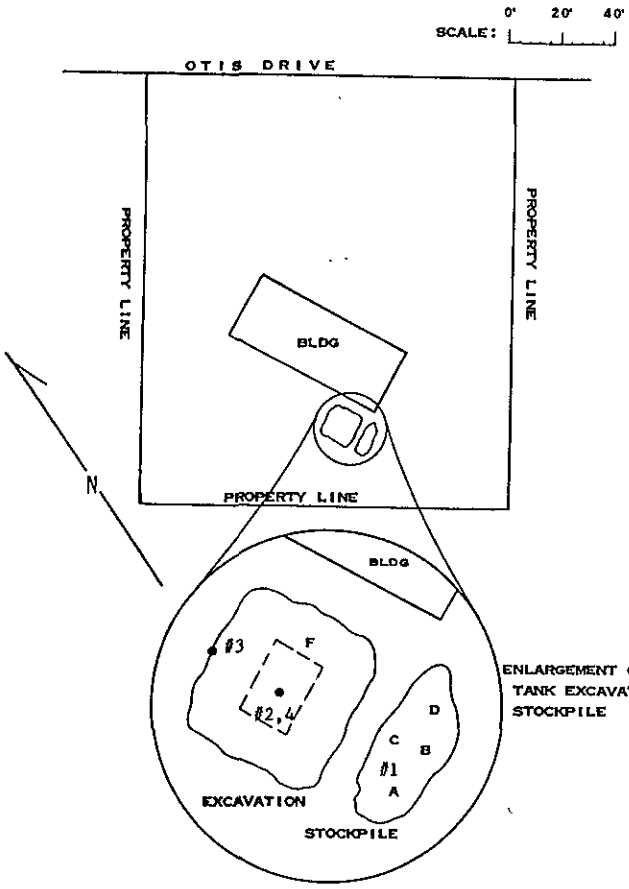
Age -- unspecified

Sampling was performed in accordance with approved methodology at the locations shown on the accompanying site diagram. Additional information is presented on the diagram including our field sampling designations and the lab identification numbers which reference the analytical results which will be found in the separate laboratory report. Sample material was collected in special containers appropriate to the type of analysis intended. Sample containers were sealed, chilled, and transported to the laboratory with standard chain of custody records maintained at each transmittal. This sampling report, the chain of custody, and the analytical report comprise the formal documentation of the sampling conducted during this phase of work at the site.

87165T1 6-15-87 Shell Oil, 2160 Otis, Alameda, CA page 1

ORIGINAL SAMPLING REPORT 87165-T-1 page 2 diagram

BLAINE TECH SERVICES INC SAMPLING REPORT 87165T1 6-15-87 SHELL OIL, 2160 OTIS DRIVE, ALAMEDA, CA.



ENLARGEMENT OF WASTE OIL TANK EXCAVATION AND STOCKPILE

MAP REF: THOMAS BROS. ALAMEDA COUNTY P. 11 C-6

LEGEND: F = FILL END

#1 STOCKPILE SOIL COMPOSITE FROM SAMPLE POINTS A-D
ANALYSIS FOR TOTAL LEAD(TTLC), SOLUBLE LEAD (STLC), ORGANIC LEAD, AND FLASHPOINT AT SEQUOIA ANALYTICAL LABORATORY
SEQUOIA LAB NO. 7061149

#2 SOIL FROM 7'
ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS (TPH) - HIGH BOILING FRACTION, TOTAL OIL AND GREASE (TOG), EPA 8010, AND EPA 8020
SEQUOIA LAB NO. 7061150

#3 SOIL FROM WALL AT 3.5'
ANALYSIS FOR TPH
SEQUOIA LAB NO. 7062310

#4 SUBSURFACE WATER SAMPLE
ANALYSIS FOR TOG
SEQUOIA LAB NO. 7062312

SAMPLING PERFORMED BY TIM BABCOCK
DIAGRAM PREPARED BY BRENT E. ADAMS

PAGE 2

REPORTAGE

Submission to the Regional Water Quality Control Board and the local regulatory/enforcement agency should include copies of the sampling report, the chain of custody, and the laboratory report. The property owner should attach a cover letter and submit all documents together in a package.

The following addresses have been listed here for your convenience:

Water Quality Control Board
San Francisco Bay Region
1111 Jackson Street
Room 6040
Oakland, CA 94607
ATTN: Tom Callaghan

Alameda County Health
Hazardous Materials Management
420 27th Street
Oakland, Ca 94612
ATTN: Ted Gerow

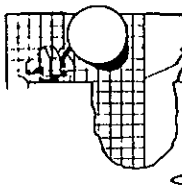
Alameda Fire Dept.
1300 Park Street
Alameda, CA 94501
ATTN: Steve McKinley

Please call if we can be of any further assistance.

Richard C. Blaine

RCB/djt

ORIGINAL SAMPLING REPORT 87165-T-1 chain of custody



BLAINE TECH SERVICES INC.

P.O. BOX 574
SAN JOSE, CA 9515
(408) 723-397

PROJECT NUMBER: 87165-T1

SITE ADDRESS: Shell @ 2160 OTIS Alameda, Ca

PLEASE INCLUDE PROJECT NUMBER AND SITE ADDRESS ON LAB REPORTS AND INVOICES

TURN-AROUND 48 hr. for #2 1 week for #1 RESULTS BY 6/17/87 LAB USED SEQ

BILLING
( ) Bill Blaine Tech Services
( ) BILL

SPECIAL INSTRUCTIONS: Composite #1 A,B,C,D to be run as 1 sample

I.D.	TYPE	ANALYSIS TO DETECT	LAB #	LAB RESULTS
1A&D	soil	lead series, fl.pt.		
2	soil	TOG, TPH(ARF), 8010 8020		
3	soil	total TOG 1 wk.		
4	water	total TOG 1 wk.		

Field sampling completed 12:52 AM/PM 6/15-87 performed by [signature]

RELEASED BY: 1:53 AM/PM 6-15-87 [signature]

ACCEPTED BY: 1:53 AM/PM 6-15-87 [signature]

___:___ AM/PM - -87 ___:___ AM/PM - -87

___:___ AM/PM - -87 ___:___ AM/PM - -87

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 06-15-87
Date Received: 06-15-87
Date Reported: 06-17-87
BTS #87165-T1

Sample Number	Sample Description	Detection Limit ppm	Gravimetric Waste Oil as Petroleum Oil ppm
7061150	Soil #2 Shell at 2160 Otis in Alameda, CA	30	1700

NOTE: Analysis was performed using EPA extraction method 3550 with Trichlorotriflouroethane as solvent, and gravimetric determination by standard methods 503E.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

jao

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 06-15-87
Date Received: 06-15-87
Date Reported: 06-17-87

BTS #87165-T1

Sample Number	Sample Description	Detection Limit ppm	Total Hydrocarbons as Diesel ppm
7061150	Soil #2 Shell at 2160 Otis in Alameda, CA	1	< 1.0

NOTE: Analysis was performed using EPA methods 3550 and 8015.

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

jao

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 06-15-87
Date Received: 06-15-87
Date Extracted: 06-16-87
Date Reported: 06-17-87

BTS #87165-T1

Sample Number

7061150

Sample Description

Soil #2
Shell at 2160 Otis
in Alameda, CA

PRIORITY POLLUTANTS

VOLATILE ORGANIC COMPOUNDS
results in ppb

Acrolein	< 10,000	trans-1,2-Dichloroethene	< 50
Acrylonitrile	< 10,000	1,2-Dichloropropane	< 50
Benzene	< 50	1,3-Dichloropropene	< 50
Bromomethane	< 50	Ethylbenzene	< 50
Bromodichloromethane	< 50	Methylene chloride	< 50
Bromoform	< 50	1,1,2,2-Tetrachloroethane	< 50
Carbon tetrachloride	< 50	Tetrachloroethene	< 50
Chlorobenzene	< 50	1,1,1-Trichloroethane	< 50
Chloroethane	< 50	1,1,2-Trichloroethane	< 50
2-Chloroethylvinyl ether	< 50	Trichloroethene	< 50
Chloroform	< 50	Toluene	< 50
Chloromethane	< 50	Vinyl chloride	< 50
Dibromochloromethane	< 50	1,2-Dichlorobenzene	< 50
1,1-Dichloroethane	< 50	1,3-Dichlorobenzene	< 50
1,2-Dichloroethane	< 50	1,4-Dichlorobenzene	< 50
1,1-Dichloroethene	< 50		

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

jao

NOTE: Methods 8010 & 8020 of the EPA were used for this analysis.

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 06-15-87
Date Received: 06-29-87
Date Reported: 07-03-87
BTS# 87165-T1

Sample Number	Sample Description	Detection Limit ppm	Gravimetric Waste Oil as Petroleum Oil ppm
7062310	Soil #3 - Shell Oil at 2160 Otis in Alameda, CA	30	47

NOTE: Analysis was performed using EPA extraction method 3550 with Trichlorotriflouroethane as solvent, and gravimetric determination by standard methods 503E.

SEQUOIA ANALYTICAL LABORATORY

Mark A. Valentini
for Arthur G. Burton
Laboratory Director

jao

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 06-15-87
Date Received: 06-29-87
Date Reported: 07-03-87

BTS #87165-T1

Sample Number	Sample Description
7062312	Soil #4 - Shell Oil at 2160 Otis in Alameda, CA

ANALYSIS

Oil & Grease, mg/L	< 5

SEQUOIA ANALYTICAL LABORATORY

Mark A. Valentini

for Arthur G. Burton
Laboratory Director

jao

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222

Blaine Tech Services
P.O. Box 5745
San Jose, CA 95150
Attn: Richard Blaine

Date Sampled: 06-15-87
Date Received: 06-15-87
Date Reported: 06-22-87

BTS #87165-T1

Sample Number	Sample Description
7061149	Soil Composite #1 a-d Shell at 2160 Otis in Alameda, CA

ANALYSIS

Flashpoint, °C	> 110

	STLC mg/L	TTLC mg/kg-wet wt.
Lead	0.16	8.2
Organic Lead	--	0.42

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

sls

We hope that the foregoing documents will be of use in your work at this site.

Please call if we can be of any further assistance.

Richard C. Blaine

RCB/dmp

ATTACHMENT C

PEG SUBSURFACE INVESTIGATION REPORT

PACIFIC ENVIRONMENTAL GROUP, INC.
Engineering • Hydrogeology • Chemistry

October 27, 1987
Project 100-85.02

Gettler-Ryan Inc.
1992 National Avenue
Hayward, CA 94545

Attn: Mr. Jeff Ryan

Re: Shell Service Station
2160 Otis Drive
Alameda, California

Gentlemen:

This letter presents the results of a soil and groundwater investigation conducted by Pacific Environmental Group, Inc. (PACIFIC) at the Shell service station located at 2160 Otis Drive in Alameda, California. The scope of work included installation of one groundwater monitoring well, laboratory soil analysis, and groundwater sampling and analysis as requested by Shell Oil Company.

PROCEDURES

One soil boring was drilled and converted to a monitoring well (S-1) on September 4, 1987. The well is located adjacent to the subsurface waste oil tank at the site, as shown on Figure 1.

The boring for the monitoring well was drilled using eight-inch diameter hollow-stem auger drilling equipment and was logged by a PACIFIC geologist using the Unified Soil Classification System. The boring log (including well construction details) is attached to this report. Soil samples for logging and analysis were collected at five-foot depth intervals by advancing a California-modified split-spoon sampler with brass liners into undisturbed soil beyond the tip of the auger. The sampler was driven a maximum of 18 inches, using a 140-pound hammer with a 30-inch drop.

The boring was advanced approximately 15 feet (below static groundwater) into the water-bearing zone, to a depth of 20.5 feet. After completion, the boring was converted to a groundwater monitoring well with the installation of 3-inch diameter, schedule 40 PVC casing, and 0.020-inch factory slotted screen. The screen was placed from a depth of 4 to 19 feet, extending approximately 1 foot above the static water level. Graded sand pack was placed in the annular space across the screened interval, extending approximately one foot above the screen. A bentonite and concrete seal extends from the sand pack to the ground surface. A locking cap and protective vault box were installed on the top of the well.

Well S-1 was sampled by PACIFIC on September 7, 1987. The sampling procedure consisted of first checking the well for water level and presence of floating petroleum product using a clear teflon bailer. No floating product was detected. The well was then purged of approximately four casing volumes of water using a centrifugal pump, and then sampled with a teflon bailer. The groundwater samples were placed into appropriate EPA-approved containers, labeled, logged onto a chain-of-custody document, and transported on ice to the laboratory.

Soil samples from the approximate depths of 5, 10, 15, and 20 feet were analyzed for the presence of high boiling hydrocarbons (calculated as diesel, jet fuel, and oil) and oil and grease. One soil sample from the 9 to 10.5 foot depth interval (just below the base of the tank) was also analyzed for the presence of volatile halocarbons using EPA method 8240. The groundwater sample was analyzed for volatile halocarbons by EPA method 624. The analytical methods are presented on the attached Certified Analytical Reports, in addition all results are summarized on the attached Tables 1 and 2.

RESULTS

Hydrogeologic Conditions

The boring for the monitoring well encountered sand to a depth of 8 feet, underlain by silt and silty sand to the total depth explored of 20.5 feet. Faint product odor was noted in soil samples from the approximate depths of 5, 15, and 20 feet. Groundwater was first noted at an approximate depth of 8 feet, and stabilized at approximately 5 feet in depth.

Laboratory Analyses

High boiling hydrocarbons were detected in all soil samples at concentrations ranging from 10 parts per million (ppm) at 10 feet (which was calculated as jet fuel), to 360 ppm at 5 feet (which was calculated as oil). Oil and grease was detected at concentrations ranging from 70 ppm at a depth of 15 feet to 1,600 ppm at a depth of 5 feet.

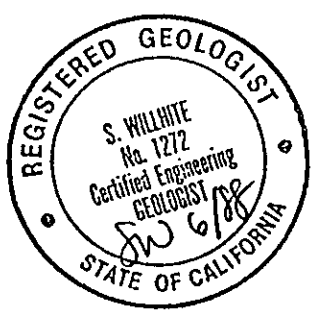
The soil sample from 9 to 10.5 feet in depth which was analyzed for volatile halocarbons had no detectable concentrations of any compounds. Soil analytical results are summarized on the attached Table 1.

Groundwater analyses indicated the presence of acetone at a concentration of 270 parts per billion (ppb). In addition, an unidentified alcohol compound not on the EPA Hazardous Substance List (HSL) was detected at a concentration of 7 parts per billion (ppb). Groundwater analytical results are summarized on attached Table 2.

If you have any questions regarding the contents of this letter, please do not hesitate to call.

Very truly yours,

PACIFIC ENVIRONMENTAL GROUP, INC.



Susan Willhite
Project Manager
CEG 1272

TABLE 1

Summary of Soil Analytical Results
for Well S-1

High Boiling Hydrocarbons and
Oil and Grease

Depth Interval (feet)	High Boiling (calc. as oil) (ppm)	High Boiling (calc. as Jet Fuel) (ppm)	Oil and Grease (ppm)
3-1/2 - 5	360	25	1,600
9 - 10-1/2	98	10	460
14 - 15-1/2	16	ND	70
19 - 20-1/2	87	ND	320

Volatile Organic Compounds

9 - 10-1/2 feet - None detected

Notes: ppm - parts per million
ND - not detected, detection limits noted on attached Certified Analytical Reports

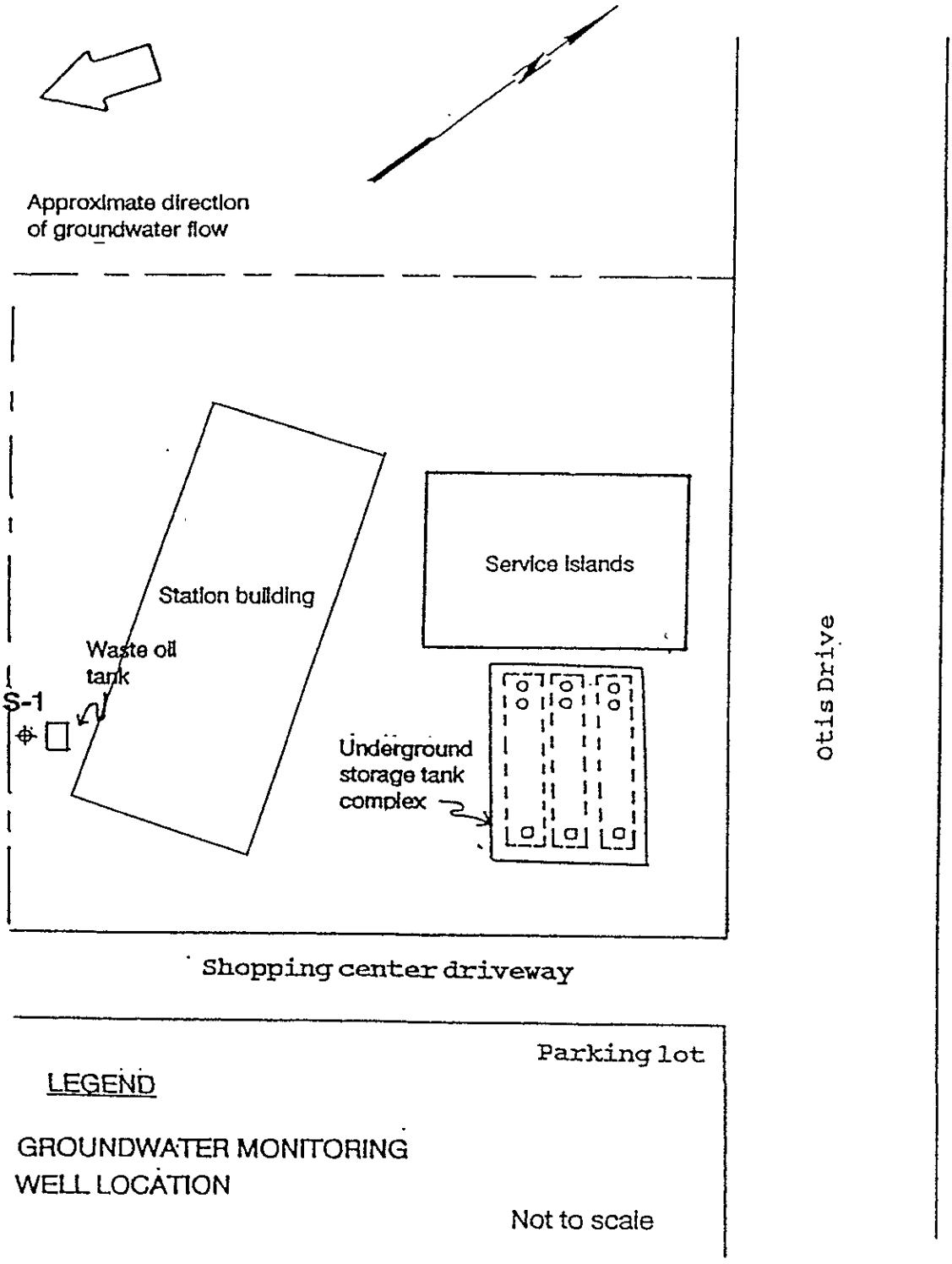
TABLE 2

Summary of Groundwater Analytical Results
for Well S-1

EPA Hazardous List Substances	
Compound	ppb
Acetone	270

Non - EPA Hazardous Substances	
Compound	ppb
Unknown alcohol	7

Note: ppb - part per billion



PACIFIC ENVIRONMENTAL GROUP, INC.

Shell Service Station
2160 Otis Drive
Alameda, California

SITE PLAN

FIGURE
1
PROJECT NO.
100-85.01

UNIFIED SOIL CLASSIFICATION SYSTEM

PRIMARY DIVISIONS			GROUP SYMBOL	TYPICAL NAMES
COARSE GRAINED SOILS more than half is larger than #200 sieve	GRAVELS half of coarse fraction larger than #4 sieve	CLEAN GRAVELS (less than 5% fines)	GW	Well graded gravels, gravel-sand mixtures; little or no fines
			GP	Poorly graded gravels or gravel-sand mixtures; little or no fines
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS half of coarse fraction smaller than # 4 sieve	CLEAN SANDS (less than 5% fines)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands or gravelly sands, little or no fines
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures, plastic fines
FINE GRAINED SOILS more than half is smaller than #200 sieve	SILTS AND CLAYS liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts, with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays silty clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS liquid limit more than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils

WELL LOG
KEY TO ABBREVIATIONS

Drilling Method
- HSA - Hollow stem auger
- CFA - Continuous flight auger
- Air - Reverse air circulation

Gravel Pack
- CA - Coarse aquarium sand

Sampling Method
- Cal. Mod. - California modified split-spoon sampler (2" inner diameter) driven 18" by a 140-pound hammer having a 30" drop. Where penetration resistance is designated "P", sampler was instead pushed by drill rig.
- Disturbed - Sample taken from drill-return materials as they surfaced.
- n/a - Not applicable

Moisture Content
- Dr - Dry
- Dp - Damp
- Mst - Moist
- Wt - Wet
- Sat - Saturated

Sorting
- PS - Poorly sorted
- MS - Moderately sorted
- WS - Well sorted

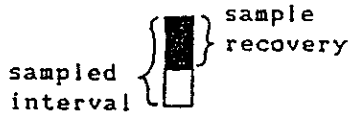
Plasticity
- L - Low
- M - Moderate
- H - High

H-NU (ppm)
- ND - No detection

Density

Sands and gravels	Silts and clays
VL - Very loose	VS - Very soft
L - Loose	Sft - Soft
MD - Medium dense	MSt - Medium Stiff
D - Dense	Stf - Stiff
VD - Very dense	VSt - Very stiff
	Hd - Hard

Symbols
- ▽ - First encountered ground water
- ▼ - Static ground water level

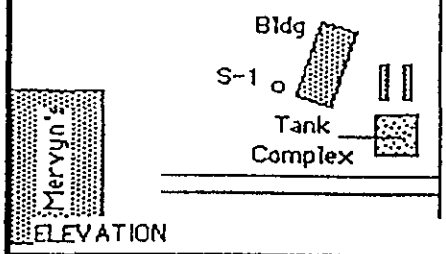


GRAIN-SIZE SCALE

GRADE LIMITS inches	GRADE LIMITS U.S. Standard sieve size	GRADE NAME
12.0		Boulders
3.0	3.0 in.	Cobbles
0.19	No. 4	Gravel
	coarse	
0.08	No. 10	
	medium	Sand
	No. 40	
	fine	
	No. 200	
		Silt
		Clay Size

PACIFIC ENVIRONMENTAL GROUP, INC.

LOCATION MAP



PACIFIC ENVIRONMENTAL GROUP, INC.

WELL / BORING NO. S-1
PAGE 1 Of 1

PROJECT NO. 100-85.01
LOGGED BY: MD
DRILLED BY: Bayland
DRILLING METHOD: HS
SAMPLING METHOD: Cal. Mod.
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: CA

CLIENT: G.R. SHELL
DATE DRILLED: 9-4-87
LOCATION: Otis St. Alameda
HOLE DIAMETER: 8"
HOLE DEPTH: 20-1/2'
WELL DEPTH: 19'
WELL DIAMETER: 3"

WELL COMPLETION	MOISTURE CONTENT	PENETRATION RESISTANCE (BLOW/FT)	DEPTH (feet)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY/REMARKS
Natural; Conc.	Mst	P	2–4			SP	Asphalt; silty sand-fill; faint product odor.
			4–8				SAND; brown; 5% silty fines; poorly graded; fine to medium grained; faint product odor. Color change in grab at approximately 5': gray-green; shell fragments.
	Wt	2	8–12			ML	SILT; greenish gray; 20% fine sand; low plasticity; very soft; no product odor.
	Wt	9	12–16			SM	SILTY SAND; greenish gray; 20-30% fines; fine grained; shell fragments; loose; faint product odor.
	Wt	57	16–20				@ 19' brown mottling in thin horizons; very dense, faint product odor.
			20–40				Bottom of boring at 20-1/2' Cave to 3-1/2'

INTERNATIONAL TECHNOLOGY CORPORATION

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

September 24, 1987

ATTN: Erin Garner

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

Project Number:	100-85.01
Lab Numbers:	S7-09-079-01 thru S7-09-079-04
Number of Samples:	4
Sample Type:	soil
Date Received:	9/10/87
Analyses Requested:	High Boiling Hydrocarbons, Oil and Grease, Volatile Organics

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 total oil and grease in soil is taken from E.P.A. 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.

IT/Santa Clara to
Pacific Environmental Group, Inc.
ATTN: Erin Garner

September 24, 1987

Lab Number: S7-Ø9-Ø79-Ø1
Sample Identification: 1ØØ-85.Ø1, S-1, 3.5-5'

nd = none detected

Results

Total Petroleum Hydrocarbons	Parts per Million - dry soil basis			
	Detected	Detection Limit	Identity	Calculated as
High Boiling Hydrocarbons	nd	35.	Diesel	—
High Boiling Hydrocarbons	25.	—	Unidentified Hydrocarbons	Jet Fuel
High Boiling Hydrocarbons	36Ø.	—	Oil	Oil
Oil and Grease	1,6ØØ.	—	.....Not Applicable....	

IT/Santa Clara to
Pacific Environmental Group, Inc.
ATTN: Erin Garner

September 24, 1987

Lab Number: S7-Ø9-Ø79-Ø2
Sample Identification: 1ØØ-85.Ø1, S-1, 9-1Ø.5'

nd = none detected

Results

Total Petroleum Hydrocarbons	Parts per Million - dry soil basis			
	Detected	Detection Limit	Identity	Calculated as
High Boiling Hydrocarbons	nd	1Ø.	Diesel	—
High Boiling Hydrocarbons	1Ø.	—	Unidentified Hydrocarbons	Jet Fuel
High Boiling Hydrocarbons	98.	—	Oil	Oil
Oil and Grease	46Ø.	—	.....Not Applicable....	

IT/Santa Clara to
Pacific Environmental Group, Inc.
ATTN: Erin Garner

September 24, 1987

Lab Number: S7-Ø9-Ø79-Ø3
Sample Identification: 1ØØ-85.Ø1, S-1, 14-15.5'

nd = none detected

Results

Total Petroleum Hydrocarbons	Parts per Million - dry soil basis			
	Detected	Detection Limit	Identity	Calculated as
High Boiling Hydrocarbons	nd	1Ø.	Diesel	—
High Boiling Hydrocarbons	nd	1Ø.	Jet Fuel	—
High Boiling Hydrocarbons	16.	—	Oil	Oil
Oil and Grease	7Ø.	—	.....Not Applicable....	

IT/Santa Clara to
Pacific Environmental Group, Inc.
ATTN: Erin Garner

September 24, 1987

Lab Number: S7-Ø9-Ø79-Ø4
Sample Identification: 1ØØ-85.Ø1, S-1, 19-2Ø.5'

nd = none detected

Results

Total Petroleum Hydrocarbons	Parts per Million - dry soil basis			
	Detected	Detection Limit	Identity	Calculated as
High Boiling Hydrocarbons	nd	1Ø.	Diesel	—
High Boiling Hydrocarbons	nd	1Ø.	Jet Fuel	—
High Boiling Hydrocarbons	87.	—	Oil	Oil
Oil and Grease	32Ø.	—	.....Not Applicable....	

INTERNATIONAL TECHNOLOGY CORPORATION

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

September 28, 1987

ATTN: Erin Garner

Enclosed is the ITAS analytical report for the presence of volatile organic contaminants in one soil sample received on September 10, 1987. Results for compounds on the E.P.A. Hazardous Substances List (HSL) are given on the enclosed summary sheet. The dichlorobenzene isomers were also not detected with a detection limit of 5 micrograms per kilogram (ppb).

The sample identification is as follows:

IT/Santa Clara Lab Number	Sample Identification
S7-09-079-02B	100-85.01, S-1, 9-10.5'

Adeline I. Dreesmann

AID/ksr

GC/MS ORGANICS ANALYSIS DATA SHEET
VOLATILE COMPOUNDS

SAMPLE IDENTIFICATION: S7-09-079-02B
DATE ANALYZED: 09/18/87
UNITS: UG/KG

CAS #	COMPOUND	CONC
67-64-1	ACETONE	10. ND
107-02-8	ACROLEIN	20. ND
107-13-1	ACRYLONITRILE	5. ND
71-43-2	BENZENE	5. ND
75-27-4	BROMODICHLOROMETHANE	5. ND
75-25-2	BROMOFORM	5. ND
74-83-9	BROMOMETHANE	10. ND
78-93-3	2-BUTANONE	10. ND
75-15-0	CARBON DISULFIDE	5. ND
56-23-5	CARBON TETRACHLORIDE	5. ND
108-90-7	CHLOROBENZENE	5. ND
124-48-1	CHLORODIBROMOMETHANE	5. ND
75-00-3	CHLOROETHANE	10. ND
110-75-8	2-CHLOROETHYLVINYL ETHER	10. ND
67-66-3	CHLOROFORM	5. ND
74-87-3	CHLOROMETHANE	10. ND
75-34-3	1,1-DICHLOROETHANE	5. ND
107-06-2	1,2-DICHLOROETHANE	5. ND
75-35-4	1,1-DICHLOROETHENE	5. ND
156-60-5	TRANS-1,2-DICHLOROETHENE	5. ND
78-87-5	1,2-DICHLOROPROPANE	5. ND
10061-01-5	CIS-1,3-DICHLOROPROPENE	5. ND
10061-02-6	TRANS-1,3-DICHLOROPROPENE	5. ND
100-41-4	ETHYLBENZENE	5. ND
591-78-6	2-HEXANONE	10. ND
75-09-2	METHYLENE CHLORIDE	5. ND
108-10-1	4-METHYL-2-PENTANONE	10. ND
100-42-5	STYRENE	5. ND
79-34-5	1,1,2,2-TETRACHLOROETHANE	5. ND
127-18-4	TETRACHLOROETHENE	5. ND
108-88-3	TOLUENE	5. ND
71-55-6	1,1,1-TRICHLOROETHANE	5. ND
79-00-5	1,1,2-TRICHLOROETHANE	5. ND
79-01-6	TRICHLOROETHENE	5. ND
108-05-4	VINYL ACETATE	10. ND
75-01-4	VINYL CHLORIDE	10. ND
95-47-6	XYLENES (TOTAL)	5. ND

ND - THIS COMPOUND WAS NOT DETECTED; THE LIMIT OF DETECTION FOR THIS COMPOUND IS STATED TO THE LEFT OF THE ND SPECIFIER.

TR - TRACE, THIS COMPOUND WAS PRESENT, BUT WAS BELOW THE LEVEL AT WHICH THE CONCENTRATION COULD ACCURATELY BE DETERMINED. THE APPROXIMATE CONCENTRATION IS REPORTED FOR YOUR REFERENCE.

INTERNATIONAL TECHNOLOGY CORPORATION

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

September 29, 1987

ATTN: Erin Garner

Enclosed is the ITAS analytical report for the presence of volatile organic contaminants in one water sample received on September 8, 1987.

The sample identification is as follows:

IT/Santa Clara Lab Number	Sample Identification
S7-09-058-01	100-85.01, S-1

Virginia L. Corbin

Virginia L. Corbin

VLC/ksr

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

17605 Fabrica Way • Cerritos, California 90701 • 213-921-9831 / 714-523-9200

CERTIFICATE OF ANALYSIS

Prepared for: IT Corporation
397 Mathew Drive
Santa Clara, CA 95050

Attn: Larry DeDionisio

Date: September 20, 1987

Date Received: September 9, 1987 P.O. Number 189993/4631-27 PEG Various Project Job Number 42752/dan

One (1) sample labeled: S7-09-058-01

The sample was analyzed for volatile organic contaminants using combined gas chromatography-mass spectrometry according to a modified EPA Method 624, purge and trap. Results for compounds on the EPA Hazardous Substances List (HSL) are given on the enclosed summary sheets. Additional non-HSL volatile organic compounds found are listed below.

Sample	Compound	Micrograms Per Liter
S7-09-058-01	Unknown alcohol	7

I certify that this report truly represents the finding of work performed by me or under my direct supervision.

Sharareh N. Moaddeli
Sharareh Nasser-Moaddeli
Group Leader

Reviewed and Approved

E. W. L. for
Richard L. Merrell
Laboratory Director

Volatile Organic Compounds
Micrograms Per Liter

Compound	S-7-09-058-01
Chloromethane	ND<10
Bromomethane	ND<10
Vinyl chloride	ND<10
Chloroethane	ND<10
Dichloromethane (methylene chloride)	ND<5
Acetone	270
Carbon disulfide	ND<5
1,1-Dichloroethylene	ND<5
1,1-Dichloroethane	ND<5
trans-1,2-Dichloroethene	ND<5
Chloroform	ND<5
1,2-Dichloroethane	ND<5
Methyl ethyl ketone (2-Butanone)	ND<10
1,1,1-Trichloroethane	ND<5
Carbon tetrachloride	ND<5
Vinyl acetate	ND<10
Bromodichloromethane	ND<5
1,2-Dichloropropane	ND<5
trans-1,3-Dichloropropene	ND<5
Trichloroethene	ND<5
Chlorodibromomethane	ND<5
1,1,2-Trichloroethane	ND<5
Benzene	ND<5
cis-1,3-Dichloropropene	ND<5
2-Chloroethyl vinyl ether	ND<10
Tribromomethane, (Bromoform)	ND<5
2-Hexanone	ND<10
4-Methyl-2-pentanone	ND<10

Volatile Organic Compounds
Micrograms Per Liter

Compound	S-7-09-058-01
Tetrachloroethene	ND<5
1,1,2,2-Tetrachloroethane	ND<5
Toluene	ND<5
Chlorobenzene	ND<5
Ethyl benzene	ND<5
Styrene	ND<5
Xylene (Total)	ND<5
Acrolein	ND<20
Acrylonitrile	ND<5
Dichlorobenzenes	ND<5

ND - This compound was not detected; the limit of detection for this analysis is the amount stated in the table above.

ATTACHMENT D

IT ANALYTIC REPORTS AND CHAIN-OF-CUSTODY

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Weiss Associates
2938 McClure Street
Oakland, CA 94609
ATTN: Joseph Theisen

Date: September 22, 1989

Work Order Number: S9-09-109

P.O. Number: MOH 890501A

This is the Certificate of Analysis for the following samples:

Client Project ID:	81-429-02, Shell, 2160 Otis Drive, Alameda, CA
Date Received by Lab:	9/12/89
Number of Samples:	2
Sample Type:	Water

The methods of analysis for metals and general chemistry are taken from E.P.A. protocol, using methods from SW-846, 3rd Edition or Methods for Chemical Analysis of Water and Wastes, 600/4-79-020. The method used is listed adjacent to the parameter in the table.

The method of analysis for volatile halocarbons is taken from E.P.A. Methods 601 and 8010. Samples are examined using the purge and trap technique. Final detection is by gas chromatography using an electrolytic conductivity detector.

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 involves extracting the samples with solvent and examining the extracts by gas chromatography using a flame ionization detector.

The method of analysis for oil and grease is taken from Standard Methods for the Examination of Water and Wastewater, Section 503E. Samples are extracted with repeated portions of solvent and the extract is treated with silica gel to remove polar compounds. The extract is evaporated and oil and grease is determined gravimetrically.

continued

IT ANALYTICAL SERVICES
SAN JOSE, CA

The method of analysis for oil and grease is taken from Standard Methods for the Examination of Water and Wastewater, Section 503E. Samples are extracted with repeated portions of solvent and the extract is treated with silica gel to remove polar compounds. The extract is evaporated and oil and grease is determined gravimetrically.

The method of analysis for polychlorinated biphenyl mixtures involves diluting or extracting the sample with solvent. The resulting extract is cleaned-up to remove interferences and examined by gas chromatgraphy using an electron capture detector.

Any of the following polychlorinated biphenyl mixtures would have been detected had it been present at or above the limit of detection: Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262 and 1268.

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.

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

Reviewed and Approved

C Horn

Christine Horn
Operations Manager

CH/an
7 Pages Following - Tables of Results

Date: September 22, 1989
Client Project ID: 81-429-02, Shell,
2160 Otis Drive, Alameda, CA

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-09-109

Client Sample ID: 099429-1

Sample Date: 9/11/89
Lab Sample ID: S9-09-109-01
Receipt Condition: Cool

Results - Milligrams per Liter

Parameter	E.P.A. Method	Detection Limit	Detected
Cadmium	6010	0.01	None
Chromium	6010	0.02	0.09
Lead	6010	0.06	0.09
Zinc	6010	0.02	0.10

Date: September 22, 1989
Client Project ID: 81-429-02, Shell,
2160 Otis Drive, Alameda, CA

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-09-109

Client Sample ID: 099429-1
Sample Date: 9/11/89
Lab Sample ID: S9-09-109-01
Receipt Condition: Cool, pH ≤2

Low Boiling Hydrocarbons Analysis Date: 9/14/89

High Boiling Hydrocarbons Extraction Date: 9/15/89
High Boiling Hydrocarbons Analysis Date: 9/16/89

Oil & Grease Extraction Date: 9/13/89
Oil & Grease Analysis Date: 9/14/89

Total Petroleum Hydrocarbons - Modified E.P.A. Methods 8015, 8020
Standard Methods, 503E

Results - Milligrams per Liter

Parameter	Detection Limit	Detected
Low Boiling Hydrocarbons, calculated as Gasoline	0.05	None
Benzene	0.0005	None
Toluene	0.001	None
Ethyl Benzene	0.001	None
Xylenes (total)	0.003	None
High Boiling Hydrocarbons, calculated as Diesel	0.1	None
Oil and Grease	1.0	None

Date: September 22, 1989
Client Project ID: 81-429-02, Shell,
2160 Otis Drive, Alameda, CA

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-09-109

Client Sample ID: 099429-1

Sample Date: 9/11/89
Lab Sample ID: S9-09-109-01
Receipt Condition: Cool
Extraction Date: 9/15/89
Analysis Date: 9/15/89

Polychlorinated Biphenyl Mixtures

Results - Micrograms per Liter

Lab Sample ID	Client Sample ID	Aroclor Detected	Amount Detected
S9-09-109-01	099429-1	None	None
Detection Limit			0.5

Date: September 22, 1989
Client Project ID: 81-429-02, Shell,
2160 Otis Drive, Alameda, CA

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-09-109

Client Sample ID: 099429-1

Sample Date: 9/11/89
Lab Sample ID: S9-09-109-01
Receipt Condition: Cool pH ≤2
Analysis Date: 9/19/89

Volatile Organics - E.P.A. Methods 624, 8240

Results - Milligrams per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Chloromethane	0.010	None	cis-1,3-Dichloropropene	0.005	None
Bromomethane	0.010	None	Trichloroethene	0.005	None
Vinyl Chloride	0.010	None	Chlorodibromomethane	0.005	None
Chloroethane	0.010	None	1,1,2-Trichloroethane	0.005	None
Methylene Chloride	0.005	None	Benzene	0.005	None
Acetone	0.010	None	trans-1,3-Dichloropropene	0.005	None
Carbon Disulfide	0.005	None	Bromoform	0.005	None
1,1-Dichloroethene	0.005	None	4-Methyl-2-pentanone	0.010	None
1,1-Dichloroethane	0.005	None	2-Hexanone	0.010	None
1,2-Dichloroethene (Total)	0.005	None	Tetrachloroethene	0.005	None
Chloroform	0.005	None	1,1,2,2-Tetrachloroethane	0.005	None
1,2-Dichlorethane	0.005	None	Toluene	0.005	None
2-Butanone	0.010	None	Chlorobenzene	0.005	None
1,1,1-Trichloroethane	0.005	None	Ethylbenzene	0.005	None
Carbon Tetrachloride	0.005	None	Styrene	0.005	None
Vinyl Acetate	0.010	None	Xylenes (Total)	0.005	None
Bromodichloromethane	0.005	None	Acrolein	0.010	None
1,2-Dichloropropane	0.005	None	Acrylonitrile	0.010	None

Surrogates	Limits	% Rec
1,2-Dichloroethane-d4	76-114	103.
Toluene-d8	88-110	101.
4-Bromofluorobenzene	86-115	92.

Date: September 22, 1989
Client Project ID: 81-434-02, Shell,
2160 Otis Drive, Alameda, CA

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-09-109

Client Sample ID: 099429-1

Sample Date: 9/11/89
Lab Sample ID: S9-09-109-01
Receipt Condition: Cool pH 7
Extraction Date: 9/14/89
Analysis Date: 9/19/89

Semi-Volatile Organics -E.P.A. Methods 625, 8270; Results - Milligrams per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Phenol	0.010	None	2,4-Dinitrophenol	0.050	None
bis(2-Chloroethyl)ether	0.010	None	4-Nitrophenol	0.050	None
2-Chlorophenol	0.010	None	Dibenzofuran	0.010	None
1,3-Dichlorobenzene	0.010	None	2,4-Dinitrotoluene	0.010	None
1,4-Dichlorobenzene	0.010	None	2,6-Dinitrotoluene	0.010	None
Benzyl alcohol	0.010	None	Diethylphthalate	0.010	None
1,2-Dichlorobenzene	0.010	None	4-Chlorophenylphenyl ether	0.010	None
2-Methylphenol	0.010	None	Fluorene	0.010	None
bis(2-Chloroisopropyl)ether	0.010	None	4-Nitroaniline	0.050	None
4-Methylphenol	0.010	None	4,6-Dinitro-o-cresol	0.050	None
N-Nitroso-di-n-propylamine	0.010	None	N-Nitrosodiphenylamine	0.010	None
Hexachloroethane	0.010	None	4-Bromophenylphenyl ether	0.010	None
Nitrobenzene	0.010	None	Hexachlorobenzene	0.010	None
Isophorone	0.010	None	Pentachlorophenol	0.050	None
2-Nitrophenol	0.010	None	Phenanthrene	0.010	None
2,4-Dimethylphenol	0.010	None	Anthracene	0.010	None
Benzoic Acid	0.050	None	Di-n-butylphthalate	0.010	None
bis(2-Chloroethoxy)methane	0.010	None	Fluoranthene	0.010	None
2,4-Dichlorophenol	0.010	None	Pyrene	0.010	None
1,2,4-Trichlorobenzene	0.010	None	Butylbenzylphthalate	0.010	None
Naphthalene	0.010	None	3,3'-Dichlorobenzidine	0.020	None
4-Chloroaniline	0.010	None	Benzo(a)anthracene	0.010	None
Hexachlorobutadiene	0.010	None	bis(2-Ethylhexyl)phthalate	0.010	None
4-Chloro-3-methylphenol	0.010	None	Chrysene	0.010	None
2-Methylnaphthalene	0.010	None	Di-n-octylphthalate	0.010	None
Hexachlorocyclopentadiene	0.010	None	Benzo(b)fluoranthene	0.010	None
2,4,6-Trichlorophenol	0.010	None	Benzo(k)fluoranthene	0.010	None
2,4,5-Trichlorophenol	0.050	None	Benzo(a)pyrene	0.010	None
2-Chloronaphthalene	0.010	None	Indeno(1,2,3-cd)pyrene	0.010	None
2-Nitroaniline	0.050	None	Dibenz(a,h)anthracene	0.010	None
Dimethylphthalate	0.010	None	Benzo(g,h,i)perylene	0.010	None
Acenaphthylene	0.010	None	N-Nitrosodimethylamine	0.010	None
3-Nitroaniline	0.050	None	1,2-Diphenylhydrazine	0.010	None
Acenaphthene	0.010	None	Benzidine	0.050	None

Surrogates	Limits	% Rec	Surrogates	Limits	% Rec
Nitrobenzene-d5	35-114	92.	Phenol-d5	10-94	56.
2-Fluorobiphenyl	43-116	91.	2-Fluorophenol	21-100	19.
Terphenyl-d14	33-141	55.	2,4,6-Tribromophenol	10-123	94.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-09-109

Client Sample ID: 099429-21 Trip Blank
Sample Date: 9/11/89
Lab Sample ID: S9-09-109-02
Receipt Condition: Cool, pH ≤2

Low Boiling Hydrocarbons Analysis Date: 9/14/89

High Boiling Hydrocarbons Extraction Date: 9/15/89
High Boiling Hydrocarbons Analysis Date: 9/16/89

Total Petroleum Hydrocarbons - Modified E.P.A. Methods 8015, 8020

Results - Milligrams per Liter

Parameter	Detection Limit	Detected
Low Boiling Hydrocarbons, calculated as Gasoline	0.05	None
Benzene	0.0005	None
Toluene	0.001	None
Ethyl Benzene	0.001	None
Xylenes (total)	0.003	None
High Boiling Hydrocarbons, calculated as Diesel	0.1	None

Date: September 22, 1989
Client Project ID: 81-434-02, Shell,
2160 Otis Drive, Alameda, CA

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-09-109

Client Sample ID: 099429-21 Trip Blank

Sample Date: 9/11/89
Lab Sample ID: S9-09-109-02
Receipt Condition: Cool pH ≤2
Analysis Date: 9/19/89

Volatile Organics - E.P.A. Methods 624, 8240

Results - Milligrams per Liter

Parameter	Detection Limit	Detected	Parameter	Detection Limit	Detected
Chloromethane	0.010	None	cis-1,3-Dichloropropene	0.005	None
Bromomethane	0.010	None	Trichloroethene	0.005	None
Vinyl Chloride	0.010	None	Chlorodibromomethane	0.005	None
Chloroethane	0.010	None	1,1,2-Trichloroethane	0.005	None
Methylene Chloride	0.005	None	Benzene	0.005	None
Acetone	0.010	None	trans-1,3-Dichloropropene	0.005	None
Carbon Disulfide	0.005	None	Bromoform	0.005	None
1,1-Dichloroethene	0.005	None	4-Methyl-2-pentanone	0.010	None
1,1-Dichloroethane	0.005	None	2-Hexanone	0.010	None
1,2-Dichloroethene (Total)	0.005	None	Tetrachloroethene	0.005	None
Chloroform	0.005	None	1,1,2,2-Tetrachloroethane	0.005	None
1,2-Dichlorethane	0.005	None	Toluene	0.005	None
2-Butanone	0.010	None	Chlorobenzene	0.005	None
1,1,1-Trichloroethane	0.005	None	Ethylbenzene	0.005	None
Carbon Tetrachloride	0.005	None	Styrene	0.005	None
Vinyl Acetate	0.010	None	Xylenes (Total)	0.005	None
Bromodichloromethane	0.005	None	Acrolein	0.010	None
1,2-Dichloropropane	0.005	None	Acrylonitrile	0.010	None

Surrogates	Limits	% Rec
1,2-Dichloroethane-d4	76-114	100.
Toluene-d8	88-110	99.
4-Bromofluorobenzene	86-115	92.

WEISS ASSOCIATES

2938 McClure St., Oakland, CA 94609 415-465-1100

WIC # 204-007-205
AFE# 986632

~~SG-09-105~~
SG-09-109

CHAIN-OF-CUSTODY RECORD AND ANALYTIC INSTRUCTIONS

Shuttle Inventory Number: /

Shipping Seal No. /

WA Personnel: Be sure to include copy of this form in the field sampling files

Project ID: 81-429-02

Sampled by: TBP

Laboratory Name: International Technical

NOTES TO LAB:
1) Specify analytic method and detection limit in report.
2) Notify us if there are any anomalous peaks on GC or other scans.
3) Duplicates listed in parentheses.
4) ANY QUESTIONS/CLARIFICATIONS: CALL US.

Sample ID	Sampling Date	Sample/ Container Type[1]	Analyze/ Hold[2]	Turn-around[3]	Analyze For:	Analytic Method/ Detection Limit	Comments
ABC(3) 099429-1	9-8-89	W/V	A	N	low boiling gas-BeTX	mod 8015	
DE(2)		W/G			high boiling-diesel	mod 8015	
G(2)		W/G			TOG	503E	
HI(2)		W/G			PCB's	GC	
JK(2)		W/G			PCP's, PNA's, creosote	8270	
L(1)		W/P			Cd, Cr, Pb, Zn	ICP	
MNP(3)		W/V			VOC's	624	
QA(1) 099429-22		W/G			NBH	← 1L	624 → TRIPS
B(1) 099429-21		W/V			Gas-BeTX	← 40mL VOA	HIGH BOILING

X [signature] 9/12/89
Received by (Signature), Date

X [signature] 9/12/89 1630
Released by (Signature), Date

X
Released by (Signature), Date

X [signature] 9/12/89 INTACT
Released by (Signature), Date

X [signature] 9/12/89 1530
Shipping Carrier, Method, Date

X Ellen A. Jackson 9/12/89 1630
Received by Lab Personnel, Date, Telephone

YES
Seal intact?, Number

1 - Sample Type Codes: W = Water, S = Soil, O = Other (specify).
Container Type Codes: V = VOA Bottle, P = Plastic Bottle, G = Glass Bottle, T = Brass Tube, O = Other (specify).

2 - Analyze/Hold: A = Analyze; HOLD (spell out) = DO NOT ANALYZE UNLESS NECESSARY OR REQUESTED.

3 - N = Normal Turnaround, F = 1-Week Turnaround, R = 24-Hour Turnaround

1C:/FORMS/CHAINCUS