



**GeoStrategies Inc.**

**WELL INSTALLATION REPORT**

UNOCAL Service Station No. 3690  
14999 Farnsworth Street  
San Leandro, California

781901-2

January 14, 1992



**GeoStrategies Inc.**

2140 WEST WINTON AVENUE  
HAYWARD, CALIFORNIA 94545

(510) 352-4800

January 14, 1992

UNOCAL Corporation  
P.O. Box 5155  
San Ramon, California 94583

Attn: Mr. Robert Boust

Re: WELL INSTALLATION REPORT  
UNOCAL Service Station No. 3690  
14999 Farnsworth Street  
San Leandro, California

Gentlemen:

This Well Installation Report has been prepared for the above referenced site.

If you have any questions, please call.

GeoStrategies Inc. by,

Handwritten signature of Cliff M. Garratt in black ink.

Cliff M. Garratt  
Hydrogeologist

Handwritten signature of Diane M. Lundquist in black ink.

Diane M. Lundquist  
Senior Engineer  
C 46725



CMG/DML/mlg

QC Review: JW

# GeoStrategies Inc.

## 1.0 EXECUTIVE SUMMARY

The results of the field activities and chemical analyses for the UNOCAL Service Station No. 3690 in San Leandro, California, are summarized below:

- o Three exploratory soil borings were drilled and lithologically logged to a depth of 30 feet below grade. These borings were completed as ground-water monitoring wells (U-1 through U-3).
- o Three soil samples were analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH - Gasoline), Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX), and Volatile Organic Compounds (VOCs). Soil samples were reported as not detected (ND) for TPH-Gasoline and BTEX. Tetrachloroethane (PCE) and 1,1,1-Trichloroethane (1,1,1-TCA) were detected at concentrations of 19 ppb and 30 ppb, respectively from boring U-3. Additionally, selected soil samples from soil boring U-3 were analyzed for Total Oil and Grease (TOG). TOG was reported as ND.
- o Groundwater samples collected from Wells U-1, U-2, and U-3 did not contain detectable levels of TPH-Gasoline and BTEX. However, 1,1-Dichloroethane (1,1-DCA) and 1,1,1-TCA were detected in Well U-3 at concentrations of 2.0 ppb and 4.5 ppb, respectively. VOCs were reported as ND for Wells U-1 and U-2. TOG was reported as ND for Well U-3.

# GeoStrategies Inc.

## 2.0 INTRODUCTION

This report has been prepared by GeoStrategies Inc. (GSI) for UNOCAL Service Station No. 3690, located at 14999 Farnsworth Street, California (Plate 1). Three exploratory soil borings were drilled on September 20, 1991, and were completed as ground-water monitoring wells U-1 through U-3. The well locations are shown on Plate 2. Ground-water samples were collected on September 30, 1991, by Gettler-Ryan Inc. (G-R), and submitted for chemical analyses. The results of the field activities and chemical analyses are discussed in this report. Field work was performed to comply with current State of California Water Resources Control Board (SWRCB) guidelines. GSI Field Methods and Procedures were presented in the GSI Work Plan Report dated June 18, 1991.

### 2.1 Site History

In March 1990, Applied GeoSystems (AGS) drilled four exploratory soil borings designated B-1 through B-4. TPH-Gasoline was detected in three of the four soil borings. The highest TPH-Gasoline level was detected in boring B-2 at a concentration of 2,400 ppm. TOG, TPH-Diesel and VOCs were detected in soil samples from Boring B-4. TPH-Gasoline was detected in groundwater samples from all four borings with the highest concentration detected in boring B-2 at 37,000 ppb. TPH-Diesel, TOG and VOCs were detected in groundwater samples obtained from Boring B-4. The results of this investigation are presented in the AGS report dated April 30, 1990.

## 3.0 SITE ACTIVITIES

### 3.1 Field Procedures

Three exploratory soil borings (U-1 through U-3) were drilled using a truck-mounted hollow-stem auger drilling rig. Boring U-1 was continuously sampled to the total depth of the boring. Soil samples were collected from approximately 5-foot intervals with a modified California split-spoon sampler fitted with pre-cleaned stainless steel liners (borings U-2 and U-3). Soil samples were described and exploratory boring logs were prepared by a GSI geologist using the Unified Soil Classification System (ASTM D2488-84) and Munsell Soil Color Charts. Exploratory boring logs are presented in Appendix A.

## GeoStrategies Inc.

Soil samples retained for chemical analyses were sealed on both ends with aluminum foil and plastic end caps. Samples were then labeled and entered onto a Chain - of - Custody form, and transported in a cooler with blue ice to National Environmental Testing, Inc. (NET), a State-certified environmental laboratory located in Santa Rosa, California.

A 4-inch long stainless steel liner of soil from each sampled interval was used to perform head-space analysis in the field to qualitatively screen for the presence of organic vapors. Head-space analysis involved transferring soil from the stainless steel liners into a clean jar and immediately covering the jar with aluminum foil, secured with a ring-type threaded lid. After approximately 20 minutes, the foil was pierced and the head-space within the jar was analyzed for organic vapors measured in parts per million (ppm) using an Organic Vapor Meter (OVM) photoionization detector. Head-space analyses are summarized on the exploratory boring logs presented in Appendix A.

### 3.3 Well Installation

Wells U-1 through U-3 were installed to a depth of 30 feet below ground surface. The wells were constructed using 2-inch-diameter Schedule 40 PVC casing and twenty-two feet of 0.020-inch machine-slotted well screen. Well screen intervals extend from 8 to 30 feet below ground surface. Lonestar #2/12 graded sand was placed in the annular space across the entire screened interval, to two feet above the top of the screen. A one-foot bentonite seal followed by a neat-cement grout seal was placed above the sand to just below grade. The wells were completed at ground surface using a water-proof locking well cap, lock, and a traffic-rated vault. Well construction details are presented in Appendix A.

### 3.4 Soil and Ground-water Analyses

Soil and ground-water samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified), BTEX according to EPA Method 8020, and VOCs according to EPA Method 8010. In addition, soil and groundwater samples from Boring/Well U-3 were analyzed for Total Oil and Grease (TOG) according to EPA Method 503E. Soil samples were analyzed by NET and groundwater samples were analyzed by Sequoia Analytical, a State-certified laboratory located in Redwood City, California.

### 3.5 Potentiometric Data and Floating Product Measurements

Water levels were measured in the monitoring wells prior to ground-water sampling on September 30, 1991. Water levels were measured with an electronic oil-water interface probe and recorded to the nearest  $\pm 0.01$  foot, using the top of well box as a measurement datum. A potentiometric map prepared from ground-water level data (Plate 3) indicates shallow groundwater flows towards the west beneath the site, with a calculated hydraulic gradient of approximately 0.01. Table 2 presents the field monitoring data.

The wells were inspected for the presence of floating product with the electronic oil-water interface probe. A clear acrylic bailer was used to visually confirm interface probe results. Floating product was not observed in the monitoring wells sampled.

## 4.0 HYDROGEOLOGIC CONDITIONS AND SITE LITHOLOGY

Subsurface lithology beneath the site interpreted from GSI and AGS exploratory boring logs consists primarily of silt and clay to the total explored depth of 30 feet. ~~A silty gravel with sand unit was observed in Boring U-1 from 7 feet to 14.5 feet below grade. This unit may also appear in Boring B-2 at an approximate thickness of 2 feet (9-11 feet) but does not appear to be laterally continuous beneath the site. A 0.5 foot gravel unit was observed in Boring U-3 from 9 to 9.5 feet below grade and a sand unit was reported in Boring B-4 from 8 to 9 feet below grade.~~

Groundwater was first encountered in Boring U-2 and U-3 approximately 9.5 feet below grade and in Boring U-3 approximately 15 feet below grade. Groundwater was observed to stabilize approximately 11 feet below grade.

## 5.0 RESULTS

### 5.1 Soil Chemical Analytical Results

Soil samples U1-8, U2-10 and U3-10 were reported as not detected (ND) for TPH-Gasoline and BTEX. ~~The VOCs, PCE, and TCE, MCA, were detected in soil sample U3-9 at concentrations of 19 ppb and 30 ppb, respectively.~~ VOCs were reported as ND for soil samples U1-8 and U2-10. TOG was reported as ND for soil sample U3-9. Soil chemical data are summarized in Table 1. The soil analytical laboratory report and Chain-of-Custody form are presented in Appendix B.

5.2 Ground-water Chemical Analytical Results

Table 3 summarizes ground-water chemical analytical data. TPH-Gasoline and benzene concentrations are presented on Plate 4. TPH - Gasoline and BTEX were reported as ND. 1,1-Dichloroethane (1,1-DCA) and 1,1,1-TCA were detected in Well U-3 at concentrations of 2.0 ppb and 4.5 ppb, respectively. VOCs were reported as ND for Wells U-1 and U-2. TOG was reported as ND for Well U-3. Groundwater analytical report and Chain-of-Custody form are presented in Appendix C.

5.3 Quality Control

Quality Control (QC) samples for this ground-water sampling included a trip blank (TB). The trip blank was prepared in the Sequoia laboratory using organic-free water to evaluate laboratory and field sample handling and transport. The Quality Control analytical results are presented in Table 3.

6.0 DISCUSSION

Based on a previous investigation by AGS, TPH-Gasoline was detected in groundwater samples collected in the exploratory borings B-1 through B-4 and in soil samples in borings B-2 through B-4. Groundwater monitoring wells U-1, U-2 and U-3 installed by GSI during the current phase of investigation did not identify any detectable concentrations of TPH-Gasoline in either the soil or groundwater. Contamination may be delineated by the newly installed wells and may only exist locally adjacent to the UST complex. The detectable concentrations of TPH-Gasoline identified in the groundwater collected from the AGS exploratory borings may not be representative of the aquifer conditions. It is our understanding that these ground-water samples were collected through the hollow-stem augers with out any development or purging of groundwater. These concentrations may have been "pulled down" by the augers during the drilling and advancement into groundwater.

Analytical results by GSI and AGS investigations have identified VOCs in the soil and groundwater in the area of the waste oil tank. These compounds, PCE, 1,1 - DCA and 1,1,1 - TCA are present in low concentrations.

TOG was identified in soil in one sample at 5 feet below ground surface in AGS exploratory boring B-4. The GSI exploratory boring U-3 (adjacent to exploratory boring B-4) did not identify any concentrations of TOG. This may suggest a localized area of contamination. The presence of the VOCs identified may be from an offsite source.

**7.0 RECOMMENDATION**

Based on this investigation and available data, GSI recommends the following activities for this site:

- o Implement quarterly sampling and monitoring of site. This data will be used to confirm the initial analytical results and ground-water flow direction. In addition to TPH-Gasoline and BTEX, analyze one time for VOCs in monitoring wells U-1, U-2 and U-3.
- o Additional work will be proposed upon confirmation of initial analytical results.



**LIST OF ATTACHMENTS**

- Plate 1. Vicinity Map
- Plate 2. Site Plan
- Plate 3. Potentiometric Map
- Plate 4. TPH-Gasoline/Benzene Concentration Map
  
- Appendix A: Exploratory Boring Logs and Well Construction Details
- Appendix B: Soil Analytical Report and Chain-of-Custody Form
- Appendix C: Groundwater Analytical Report and Chain-of-Custody Form

TABLE 1

## SOIL ANALYSES DATA

SAMPLE NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	TOG (PPB)
U1-8	20-Sep-91	27-Sep-91	<1,000	<2.5	<2.5	<2.5	<2.5	----
U2-10	20-Sep-91	27-Sep-91	<1,000	<2.5	<2.5	<2.5	<2.5	----
U3-9	20-Sep-91	27-Sep-91	<1,000	<2.5	<2.5	<2.5	<2.5	<50,000

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline

TOG = Total Oil and Grease

PPB = Parts Per Billion

Notes: 1. All data shown as <x are reported as ND (none detected).

2. The last number of sample I.D. corresponds to the approximate depth below existing grade that the sample was collected.

TABLE 2

## FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMPERATURE (F)	CONDUCTIVITY (u MHOS/CM)
U-1	30-Sep-91	2	30.2	17.24	11.11	----	6.13	5	7.52	68.5	816
U-2	30-Sep-91	2	30.6	16.85	9.91	----	6.94	5	7.76	67.5	537
U-3	30-Sep-91	2	30.3	17.76	11.46	----	6.30	5	7.85	68.6	876

- Notes: 1. Static water elevations referenced to Mean Sea Level (MSL).  
 2. Physical parameter measurements represent stabilized values.

TABLE 3

GROUND-WATER ANALYSES DATA								
WELL NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	TOG (PPM)
U-1	30-Sep-91	11-Oct-91	<30	<0.30	<0.30	<0.30	<0.30	----
U-2	30-Sep-91	11-Oct-91	<30	<0.30	<0.30	<0.30	<0.30	----
U-3	30-Sep-91	11-Oct-91	<30	<0.30	<0.30	<0.30	<0.30	<5.0
TB	----	11-Oct-91	----	----	----	----	----	----

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline

TOG = Total Oil and Grease

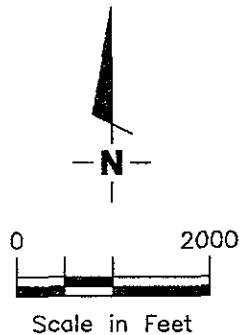
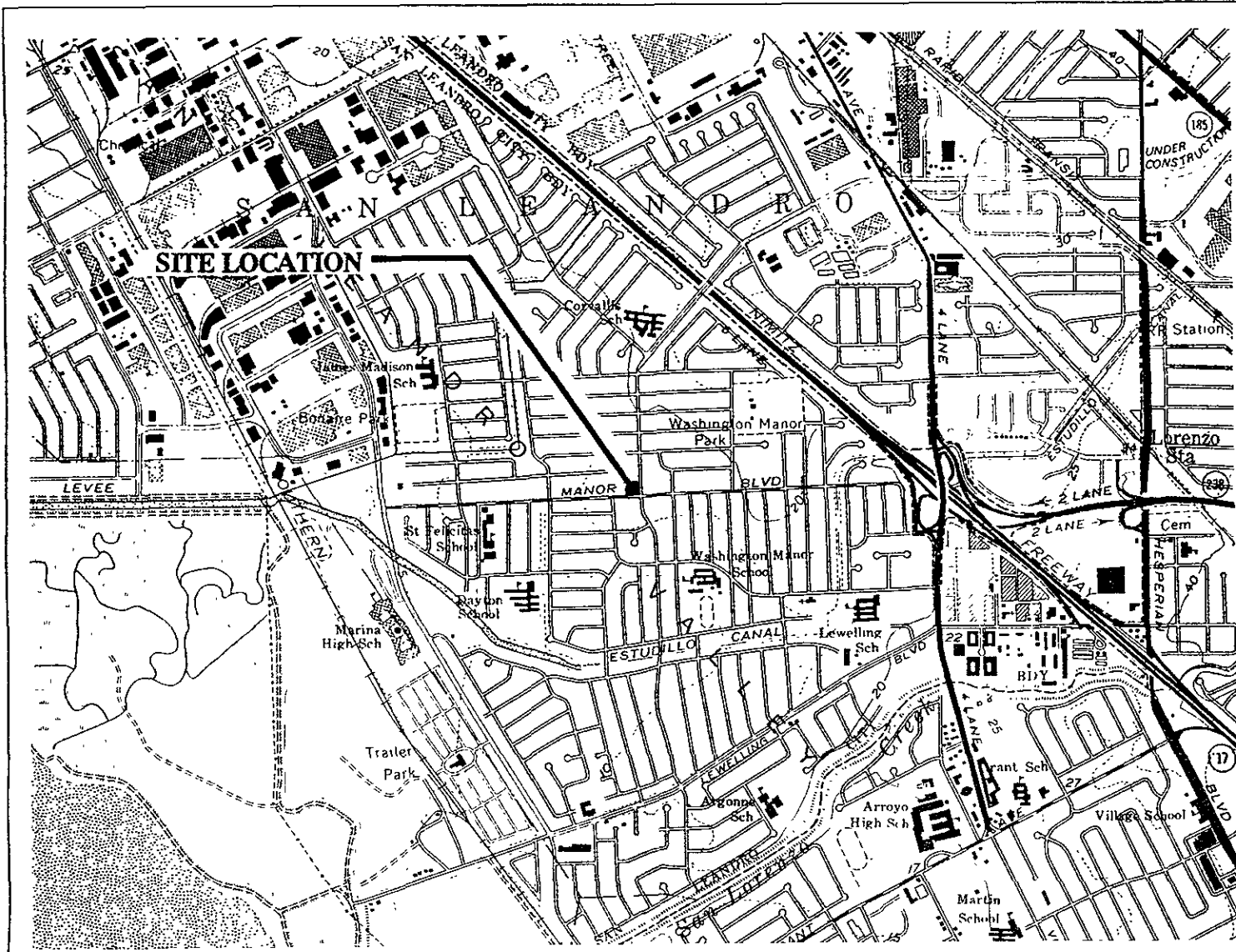
PPB = Parts Per Billion      TB = Trip Blank

PPM = Parts Per Million

Notes: 1. All data shown as <x are reported as ND (none detected).

**GeoStrategies Inc.**

ILLUSTRATIONS



Base Map: USGS Topographic Map



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VICINITY MAP  
 UNOCAL Service Station #3690  
 14999 Farnsworth Street  
 San Leandro, California

PLATE

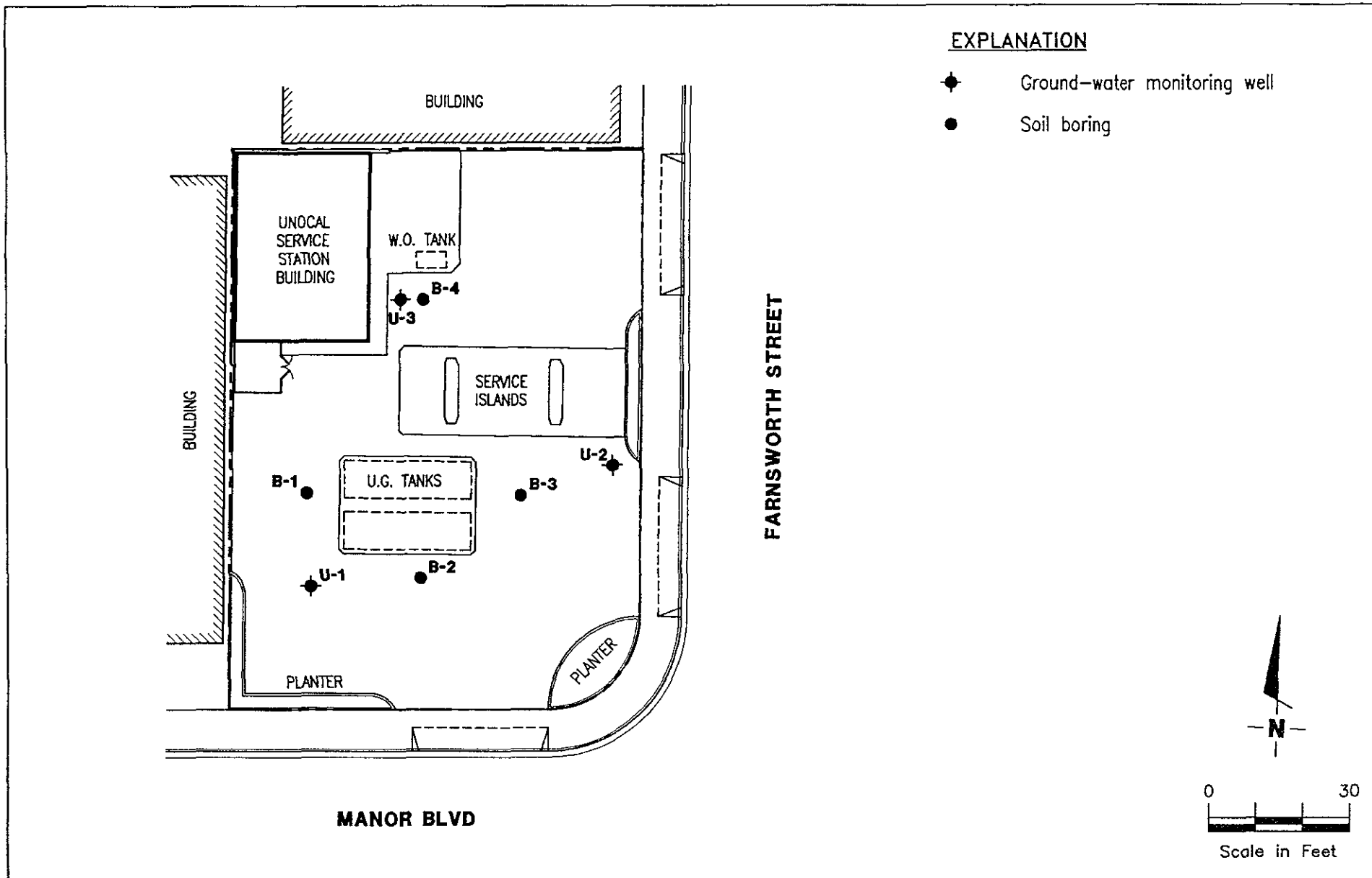
1

JOB NUMBER  
7819

REVIEWED BY

DATE  
5/91

REVISED DATE



GeoStrategies Inc.

**SITE PLAN**  
 UNOCAL Service Station #3690  
 14999 Farnsworth Street  
 San Leandro, California

PLATE

**2**


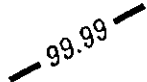
JOB NUMBER  
781901-2

REVIEWED BY  
*cmg*

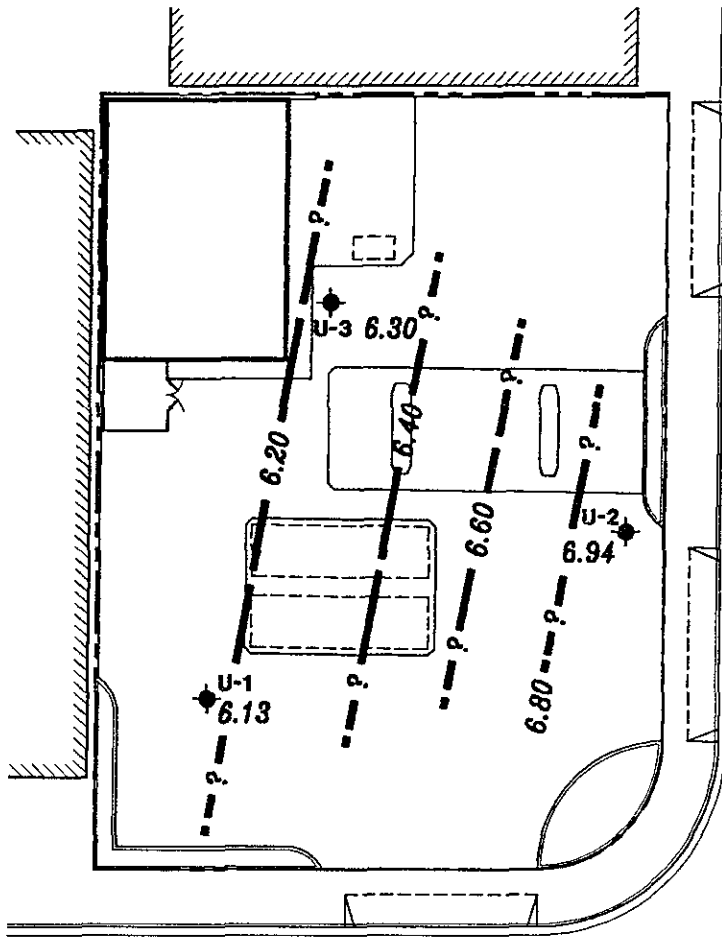
DATE  
11/91

REVISED DATE

**EXPLANATION**

-  Ground-water monitoring well
-  Ground-water elevation contour  
Approximate Gradient = 0.01
- 99.99 Ground-water elevation in feet  
referenced to Mean Sea Level  
(MSL) measured on September 30,  
1991

Note: Contours may be influenced by irrigation practices and/or site construction activities.



FARNSWORTH STREET

MANOR BLVD

Inferred  
Ground-water  
Flow Direction



GeoStrategies Inc.

POTENTIOMETRIC MAP  
UNOCAL Service Station #3690  
14999 Farnsworth Street  
San Leandro, California

PLATE

**3**

JOB NUMBER  
781901-2

REVIEWED BY  
*CMG*

DATE  
11/91

REVISED DATE

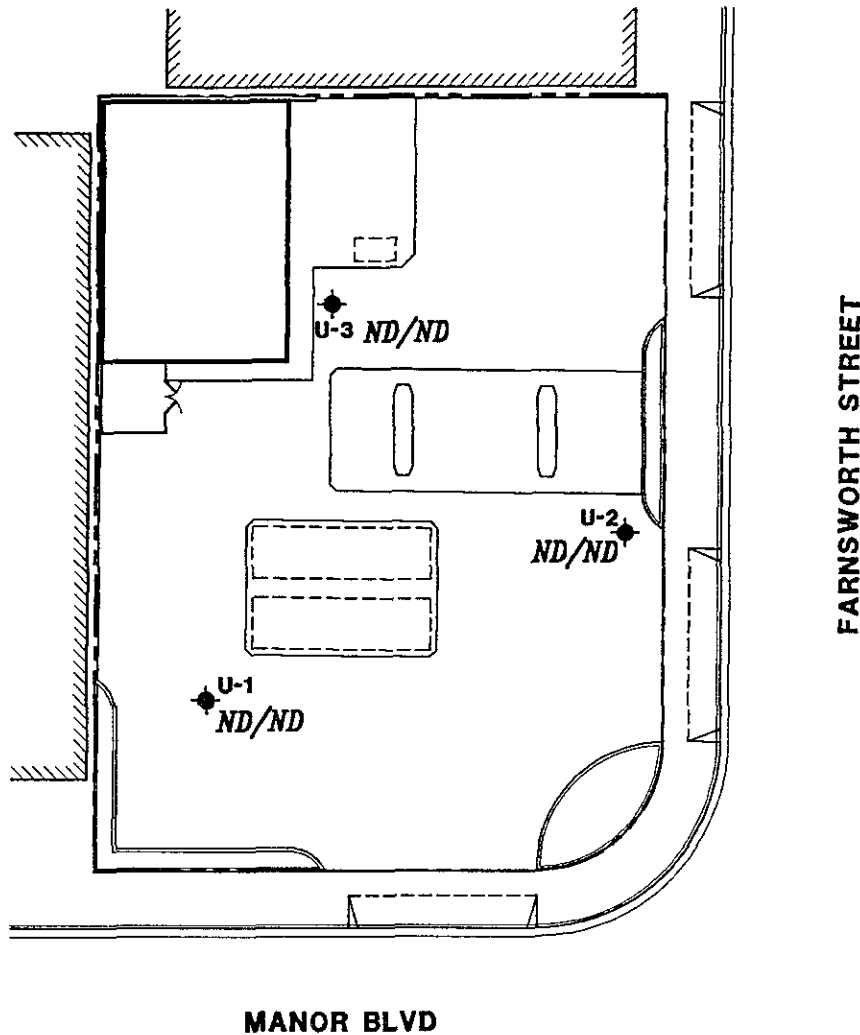


**EXPLANATION**

◆ Ground-water monitoring well

99/9.9 TPH-G (Total Petroleum Hydrocarbons calculated as Gasoline)/Benzene concentrations in ppb sampled on September 30, 1991

ND Not Detected (See laboratory reports for detection limits)



GeoStrategies Inc.

TPH-G/BENZENE CONCENTRATION MAP  
UNOCAL Service Station #3690  
14999 Farnsworth Street  
San Leandro, California

PLATE

4

JOB NUMBER  
781901-2

REVIEWED BY  
*CMG*

DATE  
11/91

REVISED DATE

**GeoStrategies Inc.**

APPENDIX A  
EXPLORATORY BORING LOGS  
AND  
WELL CONSTRUCTION DETAILS

Field location of boring:  (See Plate 2)	Project No.: 781901	Date: 09/20/91	Boring No:
	Client: UNOCAL Service Station No. 3690		[REDACTED]
	Location: 14999 Farnsworth Street		
	City: San Leandro, California		Sheet 1
	Logged by: C.M.G.	Driller: Hazmat	of 2

Drilling method: Hollow Stem Auger

Hole diameter: 8-inches

Top of Box Elevation:		Datum:	
Water Level	15.0'	14.0'	12.5'
Time	10:15	11:30	11:44
Date	09/20/91	09/20/91	09/20/91

PTD (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 2-inches
	push	C.M.E. cont.		2				SILT (ML) - black (2.5Y N2/0), medium stiff, damp.
	250	sampler		3				increase in clay to 50%
	250		U1-3.5	4				
	400			5				COLOR CHANGE to olive gray (5Y 4/2) at 4 ft.
	500			6				
	500		U1-5.0	7				
	500			8				
3			U1-8.0	9				SILTY GRAVEL with SAND (GM) - olive gray (5Y 4/2), medium dense, damp; 70% fine to coarse gravel; 15% fine sand; 15% fines;
				10				
				11				no sample 10 to 14 ft.; possible obstruction of sampler.
				12				
				13				
				14				
1.5			U1-15.5	15				CLAY (CH) - dark grayish brown (2.5Y 4/2), stiff, saturated; 100% fines; trace sand; trace organic material; medium plasticity.
				16				
				17				
				18				
				19				
0			U1-20.0	20				

Remarks: \* Converted to equivalent Standard Penetration blows/ft.

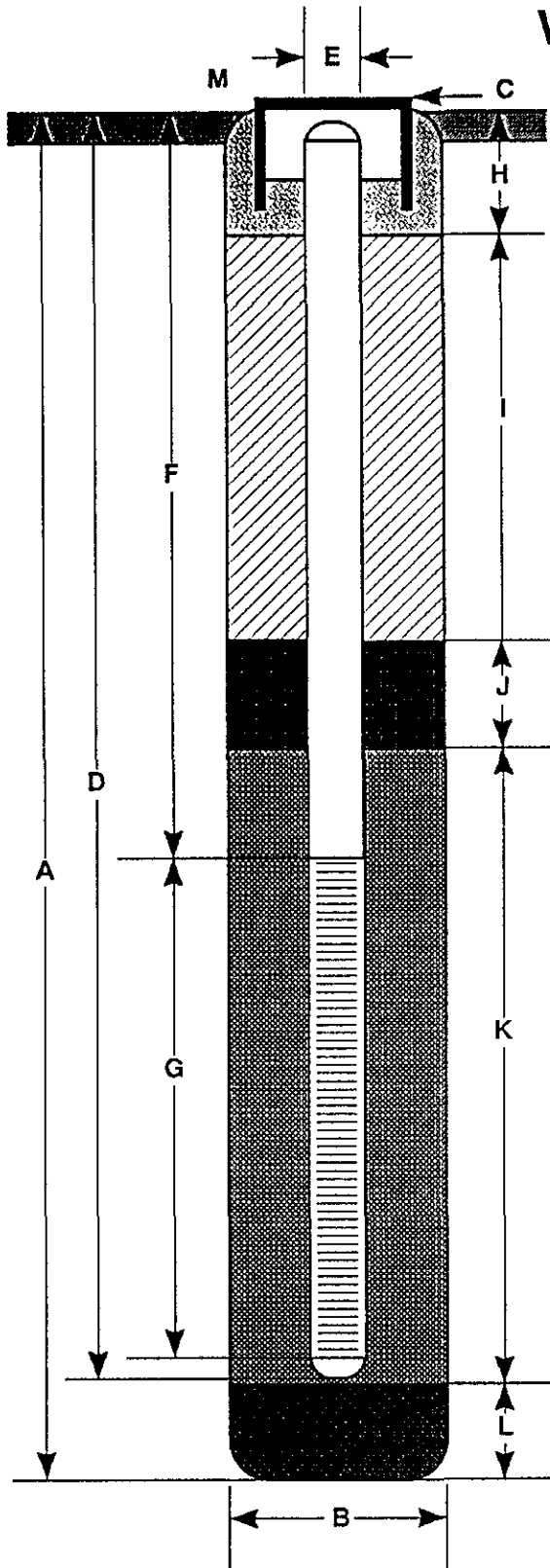
Field location of boring:  (See Plate 2)	Project No.: 781901	Date: 09/20/91	Boring No:
	Client: UNOCAL Service Station No. 3690		U1
	Location: 14999 Farnsworth Street		Sheet 2
	City: San Leandro, California		of 2
	Logged by: C.M.G.	Driller: Hazmat	
Casing installation data:			

Drilling method: Hollow Stem Auger	Top of Box Elevation:	Datum:
Hole diameter: 8-inches		

PID (ppm)	Blow/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Water Level			
								Time			
								Description			
				21							
				22							
				23							
				24							
0			U1-25.0	25							decrease in silt to 10% at 25 ft.
				26							COLOR CHANGE to dark grayish brown (2.5Y 4/2), mottling; calcareous nodules.
				27							
				28							interbedded fine sand lense from 28 to 29 ft.; 80% fine sand; 20% fines; mottling.
				29							
0			U1-30.0	30							Bottom of Boring at 30.0 ft.
				31							09/20/91
				32							
				33							
				34							
				35							
				36							
				37							
				38							
				39							
				40							

Remarks:

# WELL CONSTRUCTION DETAIL



- A Total Depth of Boring \_\_\_\_\_ 30 ft.
- B Diameter of Boring \_\_\_\_\_ 8 in.  
Drilling Method \_\_\_\_\_ Hollow Stem Auger
- C Top of Box Elevation \_\_\_\_\_ 17.24 ft.  
 Referenced to Mean Sea Level  
 Referenced to Project Datum
- D Casing Length \_\_\_\_\_ 30 ft.  
Material \_\_\_\_\_ Schedule 40 PVC
- E Casing Diameter \_\_\_\_\_ 2 in.
- F Depth to Top Perforations \_\_\_\_\_ 8 ft.
- G Perforated Length \_\_\_\_\_ 22 ft.  
Perforated Interval from \_\_\_\_\_ 8 to \_\_\_\_\_ 30 ft.  
Perforation Type \_\_\_\_\_ Machine slot  
Perforation Size \_\_\_\_\_ 0.02 in.
- H Surface Seal from \_\_\_\_\_ 0 to \_\_\_\_\_ 1 ft.  
Seal Material \_\_\_\_\_ Concrete
- I Backfill from \_\_\_\_\_ 1 to \_\_\_\_\_ 5 ft.  
Backfill Material \_\_\_\_\_ Cement
- J Seal from \_\_\_\_\_ 5 to \_\_\_\_\_ 6 ft.  
Seal Material \_\_\_\_\_ Bentonite
- K Gravel Pack from \_\_\_\_\_ 6 to \_\_\_\_\_ 30 ft.  
Pack Material \_\_\_\_\_ Lonestar #2/12 sand
- L Bottom Seal \_\_\_\_\_ ft.  
Seal Material \_\_\_\_\_
- M \_\_\_\_\_ EMCON vault with locking cap and cover.  
\_\_\_\_\_

Note: Depths measured from initial ground surface.



GeoStrategies Inc.

Well Construction Detail

WELL NO.

**U1**

JOB NUMBER  
781901

REVIEWED BY RG/CEG  
*[Signature]*

DATE  
9/91

REVISED DATE

REVISED DATE

Field location of boring:  (See Plate 2)	Project No.: 781901	Date: 09/20/91	Boring No:
	Client: UNOCAL Service Station No. 3690		U2
	Location: 14999 Farnsworth Street		Sheet 1
	City: San Leandro, California		of 2
Logged by: C.M.G.		Driller: Hazmat	
Casing installation data:			

Drilling method: Hollow Stem Auger	Top of Box Elevation:	Datum:
Hole diameter: 8-inch		

PTD (ppm)	Blows/ft. or Pressure (psf)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 8-inches
				2				
				3				
			U2-5.0	4				
0	43	S&H	5.0	5				(ML) - black (2.5Y N2/0), stiff, damp; 100% fines; trace fine sand; slightly clayey.
				6				
				7				
				8				organic material and roots at 9.0 ft.
			U2-10.0	9				small sand lens 9.0 to 9.25 ft.; trace fines; fine and coarse sand.
0	17	S&H	10.0	10				
0	18			11				(CH) - dark grayish brown (2.5Y 4/2), stiff, saturated; 100% fines; trace fine sand; medium plasticity. increase sand to 10% from 10.5 to 11.0 ft., saturated.
				12				
				13				
			U2-15.0	14				
0	12	S&H	15.0	15				
				16				
				17				
				18				
			U2-20.0	19				
0	23	S&H	20.0	20				

Remarks: \* Converted to equivalent Standard Penetration blows/ft.

**GSI** GeoStrategies Inc. Log of Boring BORING NO. U2

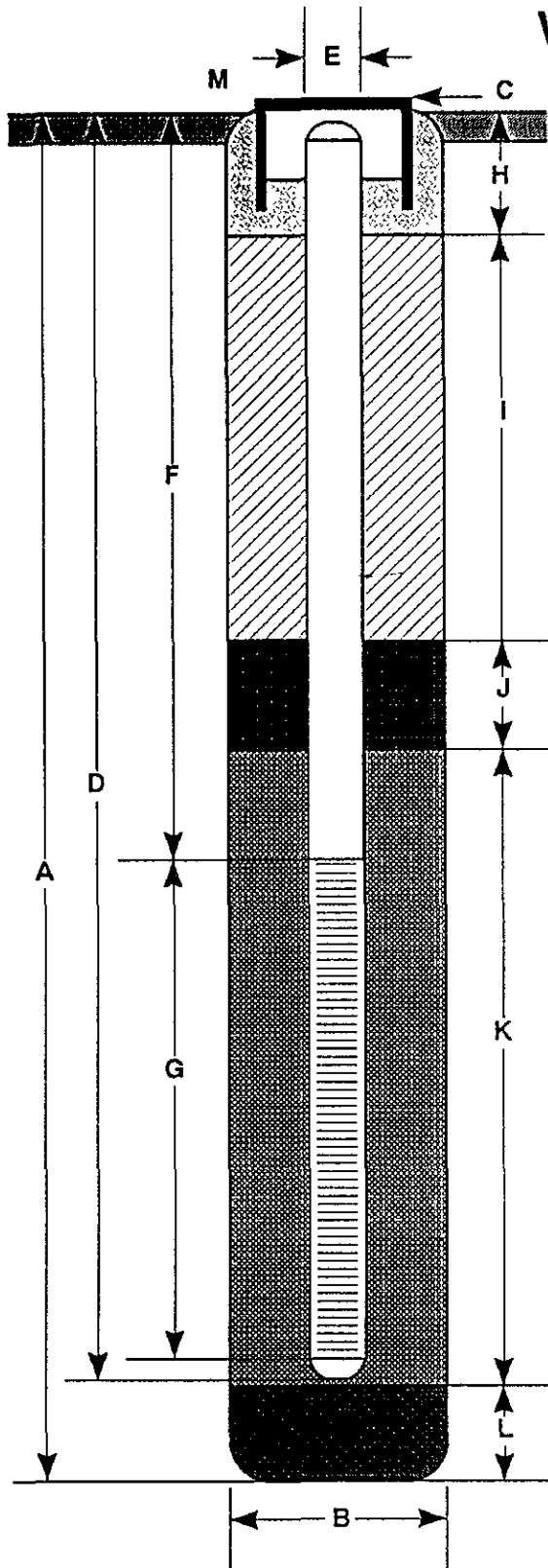
Field location of boring:  (See Plate 2)	Project No.: 781901	Date: 09/20/91	Boring No:
	Client: UNOCAL Service Station No. 3690		U2
	Location: 14999 Farnsworth Street		Sheet 2
	City: San Leandro, California		of 2
	Logged by: C.M.G.	Driller: Hazmat	

Drilling method: Hollow Stem Auger	Top of Box Elevation:	Datum:
Hole diameter: 8-inches		

PTD (ppm)	Blows/ft. or Pressure (ps)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Water Level	Time	Date	Description
				21							
				22							
				23							
				24							
0	13	S&H	U2-25.0	25							stiff, calcareous nodules; organics.
				26							
				27							
				28							organics
				29							sand lens from 28.75 to 29.0 ft.
0	26	S&H	U2-30.0	30							COLOR CHANGE to dark greenish gray (5GY 4/1), very stiff.
				31							Bottom of Boring at 30.0 ft.
				32							09/20/91
				33							
				34							
				35							
				36							
				37							
				38							
				39							
				40							

Remarks:

# WELL CONSTRUCTION DETAIL



- A Total Depth of Boring \_\_\_\_\_ 30 ft.
- B Diameter of Boring \_\_\_\_\_ 8 in.  
Drilling Method \_\_\_\_\_ Hollow Stem Auger
- C Top of Box Elevation \_\_\_\_\_ 16.85 ft.  
 Referenced to Mean Sea Level  
 Referenced to Project Datum
- D Casing Length \_\_\_\_\_ 30 ft.  
Material \_\_\_\_\_ Schedule 40 PVC
- E Casing Diameter \_\_\_\_\_ 2 in.
- F Depth to Top Perforations \_\_\_\_\_ 8 ft.
- G Perforated Length \_\_\_\_\_ 22 ft.  
Perforated Interval from \_\_\_\_\_ 8 to \_\_\_\_\_ 30 ft.  
Perforation Type \_\_\_\_\_ Machine slot  
Perforation Size \_\_\_\_\_ 0.02 in.
- H Surface Seal from \_\_\_\_\_ 0 to \_\_\_\_\_ 1 ft.  
Seal Material \_\_\_\_\_ Concrete
- I Backfill from \_\_\_\_\_ 1 to \_\_\_\_\_ 5 ft.  
Backfill Material \_\_\_\_\_ Cement
- J Seal from \_\_\_\_\_ 5 to \_\_\_\_\_ 6 ft.  
Seal Material \_\_\_\_\_ Bentonite
- K Gravel Pack from \_\_\_\_\_ 6 to \_\_\_\_\_ 30 ft.  
Pack Material \_\_\_\_\_ Lonestar #2/12 sand
- L Bottom Seal \_\_\_\_\_ ft.  
Seal Material \_\_\_\_\_
- M \_\_\_\_\_ EMCON vault with locking cap and cover.

Note: Depths measured from initial ground surface.



GeoStrategies Inc.

Well Construction Detail

WELL NO.

**U2**

JOB NUMBER  
781901

REVIEWED BY RG/CEG  
*JPV*

DATE  
9/91

REVISED DATE

REVISED DATE



Field location of boring:  (See Plate 2)	Project No.: 781901	Date: 09/20/91	Boring No:
	Client: UNOCAL Service Station No. 3690		U3
	Location: 14999 Farnsworth Street		
	City: San Leandro, California		Sheet 1
	Logged by: C.M.G.	Driller: Hazmat	of 2

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8-inch

Top of Box Elevation: \_\_\_\_\_ Datum: \_\_\_\_\_

Water Level: 9.5'

Time: 12:15

Date: 09/20/91

Description

PAVEMENT SECTION - 12 inches

CLAY (CL) - black (2.5Y N2/0), stiff, damp; 100% fines; trace sand; slightly silty.

GRAVEL (GW) - dark grayish brown (2.5Y 4/2), loose, saturated; 100% fine to coarse gravel; trace sand; trace fines.

CLAY (CH) - olive gray (5Y 4/2), very stiff, saturated; 100% fines; trace fine sand; mottling.

COLOR CHANGE to olive brown (2.5Y 4/4) at 13.5 ft.; trace silts, organics.

COLOR CHANGE to black (2.5Y N2/0) at 19.0 ft., very stiff; 5% sand; trace silt; mottling.

Remarks: \* Converted to equivalent Standard Penetration blows/ft.

**GSI** GeoStrategies Inc. Log of Boring BORING NO

**U3**

Field location of boring:  (See Plate 2)	Project No.: 781901	Date: 09/20/91	Boring No:
	Client: UNOCAL Service Station No. 3690		U3
	Location: 14999 Farnsworth Street		Sheet 2
	City: San Leandro, California		of 2
	Logged by: C.M.G.	Driller: Hazmat	

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8-inches

Top of Box Elevation: Datum:

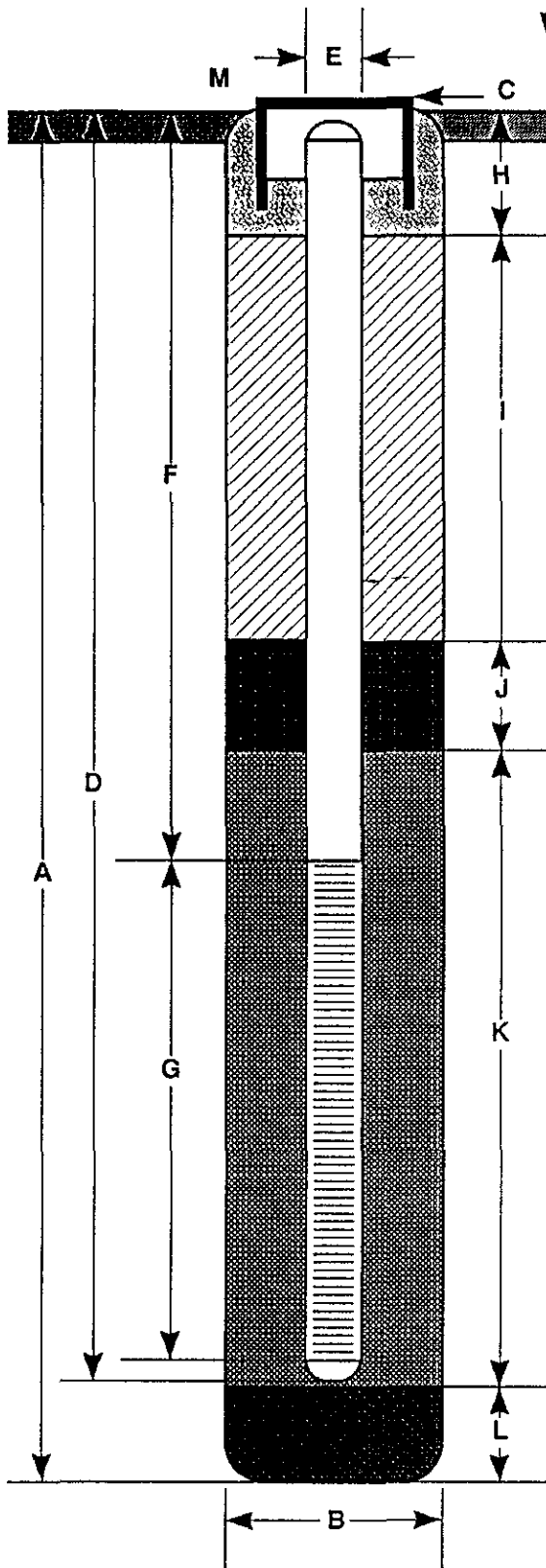
Water Level Time Date

Description

FD (ppm)	Blows/ft. or Pressure (ps)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				
				23				
				24				
0	18	S&H	U3-25.0	25				COLOR CHANGE to grayish brown (2.5Y 5/2), at 24.0 ft. decrease to trace sand; calcareous nodules; organics.
				26				
				27				
				28				
				29				
0	18	S&H	U3-30.0	30				COLOR CHANGE to olive gray (5Y 4/2) at 29.0 ft.; high plasticity; mottling.
				31				Bottom of Boring at 30.0 ft. 09/20/91
				32				
				33				
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

# WELL CONSTRUCTION DETAIL



- A Total Depth of Boring \_\_\_\_\_ 30 ft.
- B Diameter of Boring \_\_\_\_\_ 8 in.  
Drilling Method \_\_\_\_\_ Hollow Stem Auger
- C Top of Box Elevation \_\_\_\_\_ 17.76 ft.  
 Referenced to Mean Sea Level  
 Referenced to Project Datum
- D Casing Length \_\_\_\_\_ 30 ft.  
Material \_\_\_\_\_ Schedule 40 PVC
- E Casing Diameter \_\_\_\_\_ 2 in.
- F Depth to Top Perforations \_\_\_\_\_ 8 ft.
- G Perforated Length \_\_\_\_\_ 22 ft.  
Perforated Interval from \_\_\_\_\_ 8 to \_\_\_\_\_ 30 ft.  
Perforation Type \_\_\_\_\_ Machine slot  
Perforation Size \_\_\_\_\_ 0.02 in.
- H Surface Seal from \_\_\_\_\_ 0 to \_\_\_\_\_ 1 ft.  
Seal Material \_\_\_\_\_ Concrete
- I Backfill from \_\_\_\_\_ 1 to \_\_\_\_\_ 5 ft.  
Backfill Material \_\_\_\_\_ Cement
- J Seal from \_\_\_\_\_ 5 to \_\_\_\_\_ 6 ft.  
Seal Material \_\_\_\_\_ Bentonite
- K Gravel Pack from \_\_\_\_\_ 6 to \_\_\_\_\_ 30 ft.  
Pack Material \_\_\_\_\_ Lonestar #2/12 sand
- L Bottom Seal \_\_\_\_\_ ft.  
Seal Material \_\_\_\_\_
- M \_\_\_\_\_ EMCON vault with locking cap and cover.

Note: Depths measured from initial ground surface.



GeoStrategies Inc.

Well Construction Detail

WELL NO.

**U3**

JOB NUMBER  
781901

REVIEWED BY RG/CEG  
*[Signature]*

DATE  
9/91

REVISED DATE

REVISED DATE

**GeoStrategies Inc.**

APPENDIX B  
SOIL CHEMICAL ANALYTICAL REPORT AND  
CHAIN-OF-CUSTODY FORM



NATIONAL  
ENVIRONMENTAL  
TESTING, INC.

NET Pacific, Inc.  
435 Tesconi Circle  
Santa Rosa, CA 95401  
Tel: (707) 526-7200  
Fax: (707) 526-9623

RECEIVED

OCT 15 1991

GETTLER-RYAN INC.  
GENERAL CONTRACTORS

Keith Bullock  
Gettler-Ryan Inc.  
2150 W. Winton Avenue  
Hayward, CA 94545

Date: 10-14-91  
NET Client Acct No: 679  
NET Pacific Log No: 9966  
Received: 09-21-91 0830

Client Reference Information

14999 Farnsworth, San Leandro, Job: 7819.01

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

  
Jules Skamarack  
Laboratory Manager

JS:rct  
Enclosure(s)



NET Pacific, Inc

Client No: 679
Client Name: Gettler-Ryan Inc.
NET Log No: 9966

Date: 10-14-91

Page: 2

Ref: 14999 Farnsworth, San Leandro, Job: 7819.01

Descriptor, Lab No. and Results

Table with columns: Parameter, Method, Reporting Limit, U1-8 (09-20-91 1020), U2-10 (09-20-91 1430), Units. Rows include various chemical compounds like Bromodichloromethane, Bromoform, etc., with their respective reporting limits and results (ND).



NET Pacific, Inc

Client No: 679  
Client Name: Gettler-Ryan Inc.  
NET Log No: 9966

Date: 10-14-91

Page: 3

Ref: 14999 Farnsworth, San Leandro, Job: 7819.01

Descriptor, Lab No. and Results

Parameter	Method	Reporting Limit	U1-8	U2-10	Units
			09-20-91 1020	09-20-91 1430	
			98081	98082	
PETROLEUM HYDROCARBONS			---	---	
VOLATILE (SOIL)			---	---	
DILUTION FACTOR *			1	1	
DATE ANALYZED			09-27-91	09-27-91	
METHOD GC FID/5030			---	---	
as Gasoline		1,000	ND	ND	ug/Kg
METHOD 8020			---	---	
DILUTION FACTOR *			1	1	
DATE ANALYZED			09-27-91	09-27-91	
Benzene		2.5	ND	ND	ug/Kg
Ethylbenzene		2.5	ND	ND	ug/Kg
Toluene		2.5	ND	ND	ug/Kg
Xylenes, total		2.5	ND	ND	ug/Kg



NET Pacific, Inc

Client No: 679
Client Name: Gettler-Ryan Inc.
NET Log No: 9966

Date: 10-14-91

Page: 4

Ref: 14999 Farnsworth, San Leandro, Job: 7819.01

Descriptor, Lab No. and Results

Table with columns: Parameter, Method, Reporting Limit, 98083, Units. Rows include Oil & Grease (Total), Oil & Grease (Non-Polar), and a list of 28 chemical compounds under METHOD 8010.





NET Pacific, Inc

Client No: 679  
Client Name: Gettler-Ryan Inc.  
NET Log No: 9966

Date: 10-14-91

Page: 5

Ref: 14999 Farnsworth, San Leandro, Job: 7819.01

Descriptor, Lab No. and Results

Parameter	Method	Reporting Limit	U3-9 09-20-91 1115 98083	Units
PETROLEUM HYDROCARBONS			--	
VOLATILE (SOIL)			--	
DILUTION FACTOR *			1	
DATE ANALYZED			09-28-91	
METHOD GC FID/5030			--	
as Gasoline		1,000	ND	ug/Kg
METHOD 8020			--	
DILUTION FACTOR *			1	
DATE ANALYZED			09-28-91	
Benzene		2.5	ND	ug/Kg
Ethylbenzene		2.5	ND	ug/Kg
Toluene		2.5	ND	ug/Kg
Xylenes, total		2.5	ND	ug/Kg



NET Pacific, Inc

Client Acct: 679  
Client Name: Gettler-Ryan Inc.  
NET Log No: 9966

Date: 10-10-91  
Page: 6

Ref: 14999 Farnsworth, San Leandro, Job: 7819.01

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verif Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Chlorobenzene	2.0	ug/Kg	92	ND	85	78	8.6
1,1-DCE	2.0	ug/Kg	103	ND	109	111	1.9
TCE	2.0	ug/Kg	114	ND	116	104	10

COMMENT: Blank Results were ND on other analytes tested.

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verif Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	1,000	ug/Kg	99	ND	94	93	< 1
Benzene	2.5	ug/Kg	99	ND	96	95	1.7
Toluene	2.5	ug/Kg	111	ND	98	98	< 1
Gasoline	1,000	ug/Kg	101	ND	91	84	8.0
Benzene	2.5	ug/Kg	107	ND	89	80	11
Toluene	2.5	ug/Kg	117	ND	92	86	6.7

COMMENT: Blank Results were ND on other analytes tested.

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verif Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
O & G (Total)	50,000	ug/Kg	102	ND	99	111	12
O & G (Non-P)	50,000	ug/Kg	102	ND	N/A	N/A	N/A



NET Pacific, Inc

## KEY TO ABBREVIATIONS and METHOD REFERENCES

- < : Less than; When appearing in results column indicates analyte not detected at the value following. This datum supercedes the listed Reporting Limit.
- \* : Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor (but do not multiply reported values).
- ICVS : Initial Calibration Verification Standard (External Standard).
- mean : Average; sum of measurements divided by number of measurements.
- mg/Kg (ppm) : Concentration in units of milligrams of analyte per kilogram of sample (parts per million).
- mg/L : Concentration in units of milligrams of analyte per liter of sample.
- mL/L/hr : Milliliters per liter per hour.
- MPN/100 mL : Most probable number of bacteria per one hundred milliliters of sample.
- N/A : Not applicable.
- NA : Not analyzed.
- ND : Not detected; the analyte concentration is less than applicable listed reporting limit.
- NTU : Nephelometric turbidity units.
- RPD : Relative percent difference,  $100 \text{ [Value 1 - Value 2] / mean value}$ .
- SNA : Standard not available.
- ug/Kg (ppb) : Concentration in units of micrograms of analyte per kilogram of sample (parts per billion).
- ug/L : Concentration in units of micrograms of analyte per liter of sample.
- umhos/cm : Micromhos per centimeter.

### Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev. 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

SM: see "Standard Methods for the Examination of Water & Wastewater, 17th Edition, APHA, 1989.



**GeoStrategies Inc.**

APPENDIX C  
GROUND-WATER CHEMICAL ANALYTICAL REPORTS  
AND CHAIN-OF-CUSTODY FORM



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

GETTLER RYAN

Gettler Ryan 2150 W. Winton Avenue Hayward, CA 94545 Attention: Tom Paulson	Client Project ID: 3819.01, Unocal #3690, San Leandro Matrix Descript: Water Analysis Method: EPA 5030/8015/8020 First Sample #: 109-5298	Sampled: Sep 30, 1991 Received: Sep 30, 1991 Analyzed: Oct 11, 1991 Reported: Oct 25, 1991
--	--	---

## TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons	Benzene	Toluene	Ethyl Benzene	Xylenes
		$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)
109-5298	U-1	N.D.	N.D.	N.D.	N.D.	N.D.
109-5299	U-2	N.D.	N.D.	N.D.	N.D.	N.D.
109-5300	U-3	N.D.	N.D.	N.D.	N.D.	N.D.

Detection Limits:	30	0.30	0.30	0.30	0.30
-------------------	----	------	------	------	------

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard. Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tagge  
Project Manager



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan  
2150 W. Winton Avenue  
Hayward, CA 94545  
Attention: Tom Paulson

Client Project ID: 3819.01, Unocal #3690, San Leandro  
Matrix Descript: Water  
Analysis Method: SM 5520 B&F (Gravimetric)  
First Sample #: 109-5300

Sampled: Sep 30, 1991  
Received: Sep 30, 1991  
Extracted: Oct 3, 1991  
Analyzed: Oct 3, 1991  
Reported: Oct 25, 1991

## TOTAL RECOVERABLE PETROLEUM OIL

Sample Number	Sample Description	Oil & Grease mg/L (ppm)
109-5300	U-3	N.D.

Detection Limits:

5.0

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

  
Vickie Tague  
Project Manager



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID: 3819.01, Unocal #3690, San Leandro	Sampled: Sep 30, 1991
2150 W. Winton Avenue	Sample Descript: Water, U-1	Received: Sep 30, 1991
Hayward, CA 94545	Analysis Method: EPA 601	Analyzed: Oct 11, 1991
Attention: Tom Paulson	Lab Number: 109-5298	Reported: Oct 25, 1991

## PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane.....	0.50	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	0.50	N.D.
Chlorobenzene.....	0.50	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	0.50	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	0.50	N.D.
1,2-Dichlorobenzene.....	0.50	N.D.
1,3-Dichlorobenzene.....	0.50	N.D.
1,4-Dichlorobenzene.....	0.50	N.D.
Dichlorodifluoromethane.....	2.0	N.D.
1,1-Dichloroethane.....	0.50	N.D.
1,2-Dichloroethane.....	0.50	N.D.
1,1-Dichloroethene.....	0.50	N.D.
cis-1,2-Dichloroethene.....	0.50	N.D.
trans-1,2-Dichloroethene.....	0.50	N.D.
1,2-Dichloropropane.....	0.50	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	2.0	N.D.
1,1,1,2-Tetrachloroethane.....	0.50	N.D.
Tetrachloroethene.....	0.50	N.D.
1,1,1-Trichloroethane.....	0.50	N.D.
1,1,2-Trichloroethane.....	0.50	N.D.
Trichloroethene.....	0.50	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague  
District Manager





# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan 2150 W. Winton Avenue Hayward, CA 94545 Attention: Tom Paulson	Client Project ID:	3819.01, Unocal #3690, San Leandro	Sampled:	Sep 30, 1991
	Sample Descript:	Water, U-2	Received:	Sep 30, 1991
	Analysis Method:	EPA 601	Analyzed:	Oct 11, 1991
	Lab Number:	109-5299	Reported:	Oct 25, 1991

## PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane.....	0.50	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	0.50	N.D.
Chlorobenzene.....	0.50	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	0.50	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	0.50	N.D.
1,2-Dichlorobenzene.....	0.50	N.D.
1,3-Dichlorobenzene.....	0.50	N.D.
1,4-Dichlorobenzene.....	0.50	N.D.
Dichlorodifluoromethane.....	2.0	N.D.
1,1-Dichloroethane.....	0.50	N.D.
1,2-Dichloroethane.....	0.50	N.D.
1,1-Dichloroethene.....	0.50	N.D.
cis-1,2-Dichloroethene.....	0.50	N.D.
trans-1,2-Dichloroethene.....	0.50	N.D.
1,2-Dichloropropane.....	0.50	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	2.0	N.D.
1,1,2,2-Tetrachloroethane.....	0.50	N.D.
Tetrachloroethene.....	0.50	N.D.
1,1,1-Trichloroethane.....	0.50	N.D.
1,1,2-Trichloroethane.....	0.50	N.D.
Trichloroethene.....	0.50	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

*V. Tague*  
Vickie Tague  
Project Manager



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID: 3819.01, Unocal #3690, San Leandro	Sampled: Sep 30, 1991
2150 W. Winton Avenue	Sample Descript: Water, U-3	Received: Sep 30, 1991
Hayward, CA 94545	Analysis Method: EPA 601	Analyzed: Oct 11, 1991
Attention: Tom Paulson	Lab Number: 109-5300	Reported: Oct 25, 1991

## PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane.....	0.50	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	0.50	N.D.
Chlorobenzene.....	0.50	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethyivinyi ether.....	1.0	N.D.
Chloroform.....	0.50	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	0.50	N.D.
1,2-Dichlorobenzene.....	0.50	N.D.
1,3-Dichlorobenzene.....	0.50	N.D.
1,4-Dichlorobenzene.....	0.50	N.D.
Dichlorodifluoromethane.....	2.0	N.D.
<b>1,1-Dichloroethane.....</b>	<b>0.50</b>	<b>2.0</b>
1,2-Dichloroethane.....	0.50	N.D.
1,1-Dichloroethene.....	0.50	N.D.
cis-1,2-Dichloroethene.....	0.50	N.D.
trans-1,2-Dichloroethene.....	0.50	N.D.
1,2-Dichloropropane.....	0.50	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	2.0	N.D.
1,1,2,2-Tetrachloroethane.....	0.50	N.D.
Tetrachloroethene.....	0.50	N.D.
<b>1,1,1-Trichloroethane.....</b>	<b>0.50</b>	<b>4.5</b>
1,1,2-Trichloroethane.....	0.50	N.D.
Trichloroethene.....	0.50	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

*V. Tagle*  
Vickie Tagle  
Project Manager



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

<b>Gettler Ryan</b> 2150 W. Winton Avenue Hayward, CA 94545 Attention: Tom Paulson	Client Project ID: 3819.01, Unocal #3690, San Leandro	Sampled: Sep 30, 1991
	Sample Descript: Water, Travel Blank	Received: Sep 30, 1991
	Analysis Method: EPA 601	Analyzed: Oct 11, 1991
	Lab Number: 109-5301	Reported: Oct 25, 1991

## PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane.....	0.50	N.D.
Bromoform.....	1.0	N.D.
Bromomethane.....	1.0	N.D.
Carbon tetrachloride.....	0.50	N.D.
Chlorobenzene.....	0.50	N.D.
Chloroethane.....	1.0	N.D.
2-Chloroethylvinyl ether.....	1.0	N.D.
Chloroform.....	0.50	N.D.
Chloromethane.....	1.0	N.D.
Dibromochloromethane.....	0.50	N.D.
1,2-Dichlorobenzene.....	0.50	N.D.
1,3-Dichlorobenzene.....	0.50	N.D.
1,4-Dichlorobenzene.....	0.50	N.D.
Dichlorodifluoromethane.....	2.0	N.D.
1,1-Dichloroethane.....	0.50	N.D.
1,2-Dichloroethane.....	0.50	N.D.
1,1-Dichloroethene.....	0.50	N.D.
cis-1,2-Dichloroethene.....	0.50	N.D.
trans-1,2-Dichloroethene.....	0.50	N.D.
1,2-Dichloropropane.....	0.50	N.D.
cis-1,3-Dichloropropene.....	1.0	N.D.
trans-1,3-Dichloropropene.....	1.0	N.D.
Methylene chloride.....	2.0	N.D.
1,1,2,2-Tetrachloroethane.....	0.50	N.D.
Tetrachloroethene.....	0.50	N.D.
1,1,1-Trichloroethane.....	0.50	N.D.
1,1,2-Trichloroethane.....	0.50	N.D.
Trichloroethene.....	0.50	N.D.
Trichlorofluoromethane.....	1.0	N.D.
Vinyl chloride.....	1.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague  
Project Manager



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan  
2150 W. Winton Avenue  
Hayward, CA 94545  
Attention: Tom Paulson

Client Project ID: 3819.01, Unocal #3690, San Leandro

QC Sample Group: 1095298-5301

Reported: Oct 25, 1991

## QUALITY CONTROL DATA REPORT

ANALYTE	1,1 Dichloroethene	Trichloroethene	Chloro- benzene
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Method:	EPA 8010	EPA 8010	EPA 8010
Analyst:	A. Fulcher	A. Fulcher	A. Fulcher
Reporting Units:	µg/L	µg/L	µg/L
Date Analyzed:	Oct 21, 1991	Oct 21, 1991	Oct 21, 1991
QC Sample #:	BLK102191	BLK102191	BLK102191
Sample Conc.:	N.D.	N.D.	N.D.
Spike Conc. Added:	5.0	5.0	5.0
Conc. Matrix Spike:	5.9	5.3	5.3
Matrix Spike % Recovery:	118	106	106
Conc. Matrix Spike Dup.:	4.7	5.3	5.2
Matrix Spike Duplicate % Recovery:	94	- 106	104
Relative % Difference:	23	0.0	1.9

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Vickie Tague  
Project Manager

Please Note:	Conc. of M.S. - Conc. of Sample	x 100
Amended report dated:	Spike Conc. Added	
	11/1/91	
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D.	x 100
	(Conc. of M.S. + Conc. of M.S.D.) / 2	



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QC Sample Group: 1095298-5300

Reported: Oct 25, 1991

## QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
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Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L. Laikhtman	L. Laikhtman	L. Laikhtman	L. Laikhtman
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 11, 1991	Oct 11, 1991	Oct 11, 1991	Oct 11, 1991
QC Sample #:	GBLK101191	GBLK101191	GBLK101191	GBLK101191

Sample Conc.: N.D. N.D. N.D. N.D.

Spike Conc. Added: 10 10 10 30

Conc. Matrix Spike: 11 12 12 35

Matrix Spike % Recovery: 110 120 120 117

Conc. Matrix Spike Dup.: 12 12 12 36

Matrix Spike Duplicate % Recovery: 120 120 120 120

Relative % Difference: 8.7 0.0 0.0 2.8

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% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$



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Client Project ID: 3819.01, Unocal #3690, San Leandro

QC Sample Group: 109-5300

Reported: Oct 25, 1991

## QUALITY CONTROL DATA REPORT

ANALYTE	Total Recoverable Petroleum Oil
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Method: SM 5520 B&F  
 Analyst: A. Do  
 Reporting Units: mg/L  
 Date Analyzed: Oct 3, 1991  
 QC Sample #: BLK100391

Sample Conc.: N.D.

Spike Conc.  
Added: 200

Conc. Matrix  
Spike: 170

Matrix Spike  
% Recovery: 85

Conc. Matrix  
Spike Dup.: 170

Matrix Spike  
Duplicate  
% Recovery: 85

Relative  
% Difference: 0.0

SEQUOIA ANALYTICAL

*V. Tague*  
 Vickie Tague  
 Project Manager

% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2}$	x 100





**GeoStrategies, Inc.**

2140 WEST WINTON AVENUE  
HAYWARD, CALIFORNIA 94545

(510) 352-4800

January 15, 1992

Alameda County Health Agency  
Division of Hazardous Materials  
Department of Environmental Health  
80 Swan Way, Room 200  
Oakland, California 94521

Attention: Ms. Pamela Evans

Reference: UNOCAL Service Station No. 3690  
14999 Farnsworth Street  
San Leandro, California

Ms. Evans:

As requested by Mr. Robert Boust of UNOCAL Corporation, we are forwarding a copy of the Well Installation Report for the above referenced location. This report presents the results of the installation of three groundwater monitoring wells and subsequent ground-water sampling conducted at this site.

If you have any questions or comments, please call.

Sincerely,

A handwritten signature in black ink, appearing to read 'David J. Vossler', written in a cursive style.

David J. Vossler  
Senior Geologist

DJV/cmg

Enclosure

cc: Mr. Robert Boust, UNOCAL Corporation  
Mr. Richard Hiatt, Regional Water Quality Control Board  
Ms. Eileen Hughes, California EPA DTSC