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May 3, 2012

Alameda County Health Care Services Agency
Environmental Health Department
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Unocal Station #6129
Union Oil Company of California Site 351639
3420 35th Street
Oakland, California

I have reviewed the attached *Conceptual Site Model and Well Installation Work Plan* dated May 3, 2012.

I agree with the conclusions and recommendations presented in the referenced report. The information in this report is accurate to the best of my knowledge and all local Agency/Regional Board guidelines have been followed. This report was prepared by Conestoga-Rovers & Associates, upon whose assistance and advice I have relied.

This letter is submitted pursuant to the requirements of California Water Code Section 13267(b)(1) and the regulating implementation entitled Appendix A pertaining thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Sincerely,

Roya Kambin
Project Manager

Attachment: Conceptual Site Model and Well Installation Work Plan

CONCEPTUAL SITE MODEL AND WELL INSTALLATION WORK PLAN

Unocal #6129
Union Oil Company of California Facility ID 351639
3420 35th Street
Oakland, California
Fuel Leak Case No. RO0058

Prepared For:

Mr. Keith Nowell
Alameda County Environmental Health (ACEH)
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Prepared by:
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MAY 3, 2012
REF. NO. 060722 (4)
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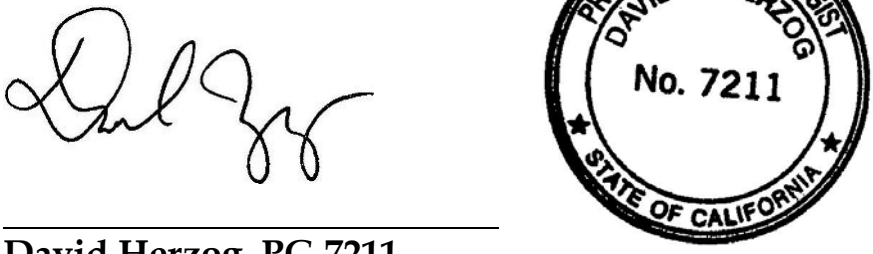
CONCEPTUAL SITE MODEL AND WELL INSTALLATION WORK PLAN

Unocal #6129
Union Oil Company of California Facility ID 351639
3420 35th Street
Oakland, California
Fuel Leak Case No. RO0058

Laura Heberle



David Herzog, PG 7211

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Conestoga-Rovers & Associates

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TABLE OF CONTENTS

LIST OF FIGURES
(Following Text)

LIST OF TABLES
(Following Text)

LIST OF APPENDICES

1.0 INTRODUCTION

On behalf of Chevron Environmental Management Company, for itself and as Attorney-in-Fact for Union Oil Company of California (hereinafter "EMC"), Conestoga-Rovers & Associates is submitting this *Conceptual Site Model and Well Installation Work Plan* (CSM) for Union Oil Company Facility ID 351639. The purpose of this CSM is to characterize current subsurface conditions at the site using all available data, identify potential data gaps, and recommend work to address the identified data gaps.

2.0 SITE BACKGROUND

The site is an active 76 Service Station located at the southwest corner of 35th Avenue and Quigley Street in Oakland, California. The site is located in a mixed commercial and residential area with a green-belt and Highway 580 located on the west and southwest sides of the site (Figure 1). A former Exxon Service Station with an open environmental case is located to the northeast across Quigley Street, and residences are located southeast and north of the site. Site facilities consist of two 12,000-gallon underground storage tanks, two dispensers under a common canopy, one used-oil UST, and a station building with three hydraulic lifts (Figure 2).

Environmental assessment activities have been ongoing since 1989. There are currently three monitoring wells installed at the site. The wells are gauged and sampled semi-annually in the second and fourth quarters. Remedial activities conducted at the site include excavation of approximately 230 cubic yards of soil from the vicinity of well MW-3. A summary of previous environmental activities conducted at the site is presented in Appendix A. Well locations are shown on Figure 2. Well construction details are presented in Table 1.

3.0 SITE CHARACTERISTIC

3.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

The site is located on the East Bay Plain as mapped by E. J. Helley and others[1]. Soil in the site vicinity consists of Holocene-age, medium-grained alluvium including unconsolidated, moderately sorted, fine sand, silt, and clayey silt with a few thin beds of coarse sand. These materials are underlain by late Pleistocene-age alluvium consisting

[1] 1979, Flatland Deposits of the San Francisco Bay Region, California: U.S. Geological Survey Professional Paper 943

of weakly consolidated, slightly weathered, poorly sorted, interbedded clay, silt, sand, and gravel.

The East Bay Plain Basin is an elongated, northwest–trending, flat alluvial plain occupying approximately 115 square miles. The basin is bounded by San Francisco Bay to the west, San Pablo Bay to the north, the Hayward fault to the east, and the boundary of the Alameda County Water District to the south. The bottom of the basin is the contact between the consolidated and unconsolidated sediment, which can occur at maximum depths of 1,000 feet. The Oakland Sub-area consists of a series of alluvial fan deposits. There are no well-defined estuarine muds that act as aquitards for groundwater migration[2]. Designated beneficial uses for groundwater in this basin include municipal, industrial, and agricultural uses.

3.2 SITE GEOLOGY AND HYDROGEOLOGY

The site is located approximately 190 feet above mean sea level and slopes gently to the southwest. The site is underlain by silt and clay interbedded with clayey sand and gravel to the total explored depth of 44 feet. A clayey sand layer appears continuous across the site and adjacent Former Exxon site (Figures 3 and 4). Boring logs are presented in Appendix B.

Three groundwater monitoring wells were installed at the site in 1989. Historical depth to groundwater has ranged from approximately 25 to 31 feet below grade (fbg) and groundwater flow has consistently been reported to the southwest (Figure 2, Table 2).

3.3 PREFERENTIAL PATHWAY EVALUATION

CRA evaluated the presence of utility lines in the vicinity of the site to determine if they may act as preferential pathways and contribute to the migration of hydrocarbon impacted groundwater. Utility information was obtained from East Bay Municipal Utility District, City of Oakland, and site observations. The majority of the identified utilities are located north of the site, running parallel along 35th Avenue, and in the southeast corner of the site (Figure 2). A subsurface utility survey conducted by Miller Brooks Environmental, Inc. in 2004 indicates that the approximate depth of the gas and electrical lines is 3 to 4 feet, the sanitary sewer is approximately 8 feet and the storm drain is approximately 16 feet. The average depth to groundwater beneath the site is

[2] Department of Water Resources, 2003, Bulletin 118-2-9.04

approximately 25 to 31 fbg; therefore, it is highly unlikely that the utilities are potential pathways.

3.4 NEARBY WELLS AND SENSITIVE RECEPTOR SURVEY

CRA reviewed California Department of Water Resources (DWR) and Alameda County Public Works Agency (ACPWA) files to identify any wells within ½-mile of the site. No drinking water supply wells were identified within the ½-mile radius. Forty-four wells were identified within ½-mile of the site. These identified wells consisted of monitoring, irrigation, recovery, and cathodic wells, and included previously destroyed wells. The nearest surface water body is Peralta Creek located approximately 500 feet northwest (crossgradient) of the site. The well information, distance, and direction from the site are summarized in Table 3 and presented on Figure 5.

4.0 DISTRIBUTION OF HYDROCARBONS

4.1 DISTRIBUTION IN SOIL

The highest concentrations of hydrocarbons detected in soil are limited primarily to the area southwest of the southern dispenser island. Maximum concentrations detected in soil are:

- Total petroleum hydrocarbons as diesel (TPHd) at 3.3 milligrams per kilogram (mg/kg) at 9.5 fbg beneath the used-oil UST
- TPH as gasoline (TPHg) at 1,200 mg/kg at 5 fbg in MW-3
- Benzene at 4.5 mg/kg at 5 fbg in MW-3
- Toluene at 2 mg/kg at 5 fbg in MW-3
- Ethylbenzene at 21 mg/kg at 5 fbg in MW-3
- Total xylenes at 6.3 mg/kg at 5 fbg in MW-3
- Methyl tertiary butyl ether (MTBE) at 0.53 mg/kg at 30.5 fbg in B-10

The primary source of hydrocarbons onsite appears to be the product piping near the southwest dispenser island. Although the volume released is not known, the majority of hydrocarbon-bearing soil southwest of the dispenser island was excavated to 6 fbg except for a 3-foot diameter area around well MW-3, removing approximately 230 cubic yards of soil from the site. Minor residual MTBE is detected in borings across the site from 6 to 50 fbg. TPHg, benzene, toluene, ethylbenzene and total xylenes are defined

vertically in soil, and although low concentrations of MTBE are detected in saturated soil the concentrations are less than what is detected in groundwater. Therefore, MTBE in soil is defined vertically to the top of the water table. Cumulative soil analytical data are presented in Table 4. Maximum soil concentrations are presented on Figure 6.

4.2 DISTRIBUTION IN GROUNDWATER

During the second semi-annual 2011 groundwater monitoring and sampling event, TPHg and MTBE were detected at maximum concentrations of 830 µg/L and 1,500 µg/L, respectively, in well MW-2. Benzene, toluene, ethylbenzene and xylenes were not detected in any of the groundwater samples. TPHg was also detected in well MW-3 at a concentration of 520 µg/L; however, the lab reported that the TPHg in wells MW-1 and MW-3 does not exhibit a gasoline pattern and is entirely due to MTBE.

The dissolved site plume appears to be commingled with the dissolved plume present on the Former Exxon station located upgradient of the site (Figure 7), and is not defined downgradient of the site. Concentration trend graphs for wells MW-1 through MW-3 are presented in Appendix C. The graphs indicate a decreasing trend in well MW-3, a stable trend in well MW-2, and an increasing MTBE trend in well MW-1. TPHg and MTBE concentrations in groundwater are above the drinking water Environmental Screening Levels (ESLs)[3] as established by the Regional Water Quality Control Board (RWQCB) (see Table A below). The *Second Semi-Annual 2011 Groundwater Monitoring and Sampling Report*, including Former Exxon data, is presented as Appendix D. Cumulative groundwater analytical data are presented in Tables 2 and 5.

[3] *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater* prepared by the California Regional Water Quality Control Board San Francisco Bay Region, Interim final dated November 2007 (Updated May 2008).

TABLE A: HYDROCARBON CONCENTRATIONS IN GROUNDWATER November 13, 2011			
	TPHg	***Benzene***	***MTBE***
Concentrations in micrograms per liter (µg/L)			
ESL Table E-1: Potential Vapor Intrusion Concerns (Residential)	***(Use Soil Gas)***	***540***	***24,000***
ESL Table F-1A Potential Drinking Groundwater ESLs	***100***	***1***	***5***
ESL Table F-4 Aquatic Habitat ESLs	***210***	***46***	***8,000***
MW-1	110*	<0.50	150
MW-2	830	<0.50	1,500
MW-3	520*	<0.50	730
*TPHg not typical of gasoline and is entirely due to MTBE			
Exxon Wells			
MW-4	<50	<0.50	<0.50
MW-5	1,900**	72	3,200
MW-6	1,600**	<0.50	6,400
MW-7	190**	<0.50	300
MW-8	<50	<0.50	<0.50
MW-9	<50	<0.50	<0.50
** Hydrocarbon pattern does not match the requested fuel.			

4.3 DISTRIBUTION IN VAPOR

No vapor assessment has been completed at the site; however, no benzene is detected in groundwater, dissolved MTBE concentrations are well below the potential vapor intrusion ESL, and depth to groundwater is greater than 25 fbg.

4.4 LIGHT NON-AQUEOUS PHASE HYDROCARBONS (LNAPL)

No LNAPL has ever been detected at the site.

5.0 RISK ASSESSMENT

A Tier 1 risk assessment was completed to identify potential exposure routes from hydrocarbons in soil, groundwater, and soil vapor. To evaluate whether the dissolved hydrocarbon concentrations are a potential risk to human health or the environment, CRA compared the data to the San Francisco Bay RWQCB groundwater and soil ESLs. The RWQCB's standards are used to evaluate whether further assessment or remediation is warranted, in prioritizing areas of concern, in establishing initial cleanup goals, and in the estimation of potential health risks. However, the presence of a chemical at concentrations exceeding the standard does not necessarily indicate that potential risks to human health or the environment exist. A summary of potential exposure pathways and risk evaluation for soil, groundwater, and soil vapor is presented below.

5.1 SOIL

The two primary exposure pathways for residual hydrocarbons in soil are leaching to groundwater and direct exposure.

Leaching Concerns

Ten soil borings contain MTBE concentrations in the vadose zone (0-25 fbg) above the soil leaching ESL (ESL Table G); however, only the soil samples from MW-3 at 5 fbg, from B-7 at 6 fbg, and from beneath the product piping contained TPHg and benzene concentrations above the soil leaching ESLs.

Direct Exposure

The site is an active service station and auto repair shop. If the site is ever redeveloped in the future, direct exposure to construction and trench workers is possible. No hydrocarbon concentrations detected soil samples collected at the site exceed the ESLs for direct exposure to construction and trench workers (ESL Table K-3); therefore, there is no risk to construction or trench workers in the future.

5.2 GROUNDWATER

The three primary exposure pathways for residual hydrocarbons in groundwater are ingestion, discharge to surface waters, and potential vapor intrusion concerns. Table A

above presents the current hydrocarbon concentrations in groundwater and the three applicable ESLs.

Ingestion

The primary exposure pathway for groundwater is ingestion. It is unlikely groundwater beneath the site will be used for drinking water. An irrigation well is located 800 feet upgradient of the site and based on little to no concentrations detected in MW-1, this well is not at risk. Both TPHg and MTBE concentrations exceed drinking water ESLs (Table F-1a).

Surface Water

The nearest surface water is Peralta Creek located approximately 500 feet northwest of the site. Although TPHg concentrations exceed the Aquatic habitat goal (ESL Table F-4a), the creek is located crossgradient and well beyond the extent of the plume.

Vapor Intrusion

No BTEX concentrations are detected in groundwater and MTBE is well below the screening level (Table E-1); therefore, there is little to no vapor intrusion risk.

5.3 VAPOR

No vapor assessment has been completed at the site; however, no benzene has been detected in groundwater and dissolved MTBE concentrations are well below the potential vapor intrusion ESL. Additionally, only trace benzene concentrations have been detected in soil. There does not appear to be a potential vapor intrusion risk.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The majority of hydrocarbon-bearing soil has been excavated and removed from the site. The only constituent of concern is MTBE in groundwater. MTBE concentrations are declining in MW-3, stable in MW-2, and increasing in MW-1. Well MW-1 is located upgradient of potential onsite source areas; therefore, increasing MTBE concentrations are likely due to groundwater migrating downgradient from the Former Exxon station. There are no drinking water supply wells within ½-mile of the site. Peralta Creek is located approximately 500 feet northwest (crossgradient) of the site and groundwater flow direction is toward the southwest so it is highly unlikely the creek will be impacted.

The plume is not defined downgradient of the site. CRA recommends installing two monitoring wells on the downgradient portion of the site to further evaluate the horizontal and vertical extent of the MTBE plume. A work plan to install the recommended wells is detailed below.

7.0 WELL INSTALLATION WORK PLAN

CRA proposes to install two monitoring wells to further delineate the MTBE plume. Due to the location of a green-belt and Highway 580 west of the site, CRA recommends installing the wells near the western corner of the site (Figure 8).

7.1 PERMITS AND ACCESS AGREEMENTS

All necessary permits will be obtained from Alameda County for the proposed well installations prior to beginning field work. Also, as necessary, a valid access agreement will be obtained and site owner(s) will be notified of the proposed field schedule.

7.2 SITE HEALTH AND SAFETY PLAN

A site- and activity-specific health and safety plan will be prepared to inform site workers of known hazards and provide health and safety guidance. The plan will be reviewed and signed daily by all site workers and visitors, and will be kept onsite during proposed field activities.

7.3 UNDERGROUND UTILITY LOCATE

Underground Service Alert (USA) will be notified at least 48 hours prior to drilling to clear the proposed boring locations with public utility companies. A private utility locator will also be retained to further minimize the risk of damaging any unidentified underground utilities. Prior to initiating drilling, the proposed well locations will be cleared by hand auger or air-knife assisted vacuum extraction to 8 fbg to check for subsurface obstructions.

7.4 MONITORING WELL INSTALLATION

After the well locations have been cleared, 8-inch diameter hollow-stem augers will be advanced to approximately 30 fbg (MW-4) and 50 fbg (MW-4A). The monitoring wells will be constructed using 2-inch diameter, Schedule 40 polyvinyl chloride (PVC) casing with a 0.020-inch machine slotted screen from approximately 25 to 30 fbg (MW-4) and 45 to 50 fbg (MW-4A). The filter pack will consist of #2/12 Monterey sand placed in the annulus from the bottom of the boring to approximately 1 foot above the screen interval. The well annulus will have a 1-foot bentonite seal above the filter pack, and the remaining annulus will be filled with neat Portland cement to approximately 1 foot below ground surface. The well will be secured in a traffic rated well box set in concrete flush with or just above the surface.

7.5 SOIL LOGGING AND SAMPLING

Soil samples will be logged at 5-foot intervals and screened using a photo-ionization detector (PID). The PID measurements will be documented on the boring logs. Soil type will be logged using the Unified Soil Classification System. A copy of CRA's standard operating procedures for well installation is included in Appendix E.

Soil samples retained for chemical analysis will be stored in an ice-filled cooler and submitted to a State-certified laboratory for analysis under chain-of-custody. The samples will be analyzed for TPHg, benzene, toluene, ethylbenzene, xylenes, and MTBE by EPA Method 8260B.

7.6 SOIL DISPOSAL / RECYCLING

Waste generated during field activities will be temporarily stored onsite in DOT-approved 55-gallon drums. Following review of laboratory analytical results, the waste will be transported to a Chevron approved facility for disposal/recycling.

7.7 WELL DEVELOPMENT

The wells will be developed using surge-block agitation and bailer or pump evacuation. A maximum of 10 casing volumes will be purged during the well development process. Water quality parameters (temperature, pH, conductivity, turbidity, and dissolved oxygen) will be measured periodically and noted on the well development log.

7.8 GROUNDWATER MONITORING AND SAMPLING

The site is currently monitored and sampled semi-annually in the second and fourth quarters. Wells MW-4 and MW-4A will be monitored and sampled quarterly for a minimum of four quarters, after which time sampling will be reduced to semi-annually.

7.9 WELL ELEVATION SURVEY

The top of casing elevation of wells MW-4 and MW-4A will be surveyed by a California licensed land surveyor to mean sea level datum. All existing site wells will be resurveyed to ensure they are surveyed to the same datum. The surveyor will use a nearby benchmark as a reference datum. Horizontal well coordinates will be measured in compliance with AB2886 (Geotracker), and uploaded to Geotracker.

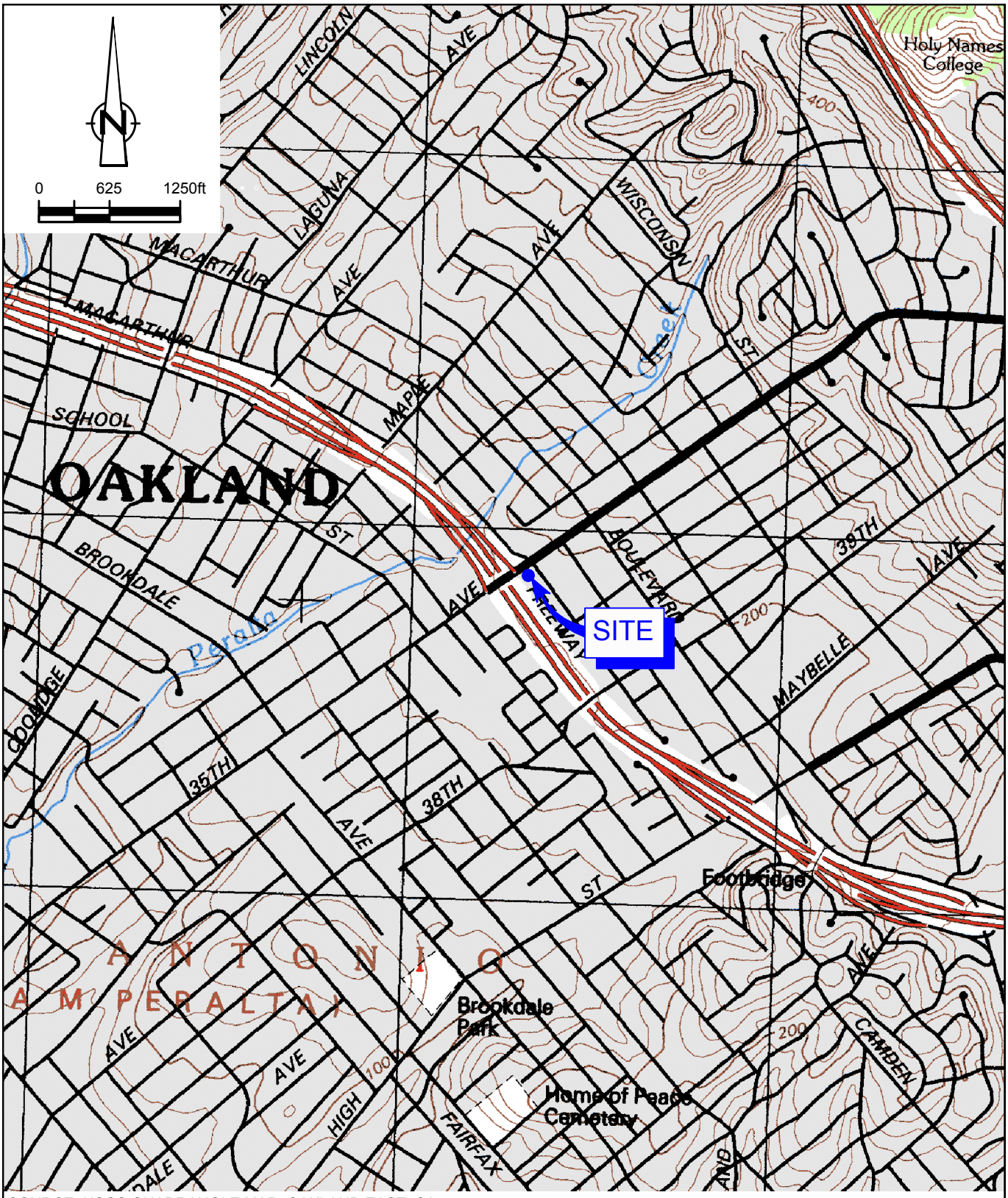
7.10 REPORT PREPARATION

After the analytical results are received, a report will be prepared that will include:

- Site background and summary of previous investigations
- Description of the drilling activities
- Well construction details
- Description of the soil sampling methods
- A figure illustrating the well locations
- Boring and well construction logs
- Tabulated soil analytical data
- Analytical reports and chain-of-custody forms
- Description of soil disposal methods
- Data analysis and interpretation
- Conclusions and recommendations

The proposed scope of work will proceed upon approval from Alameda County Environmental Health.

FIGURES

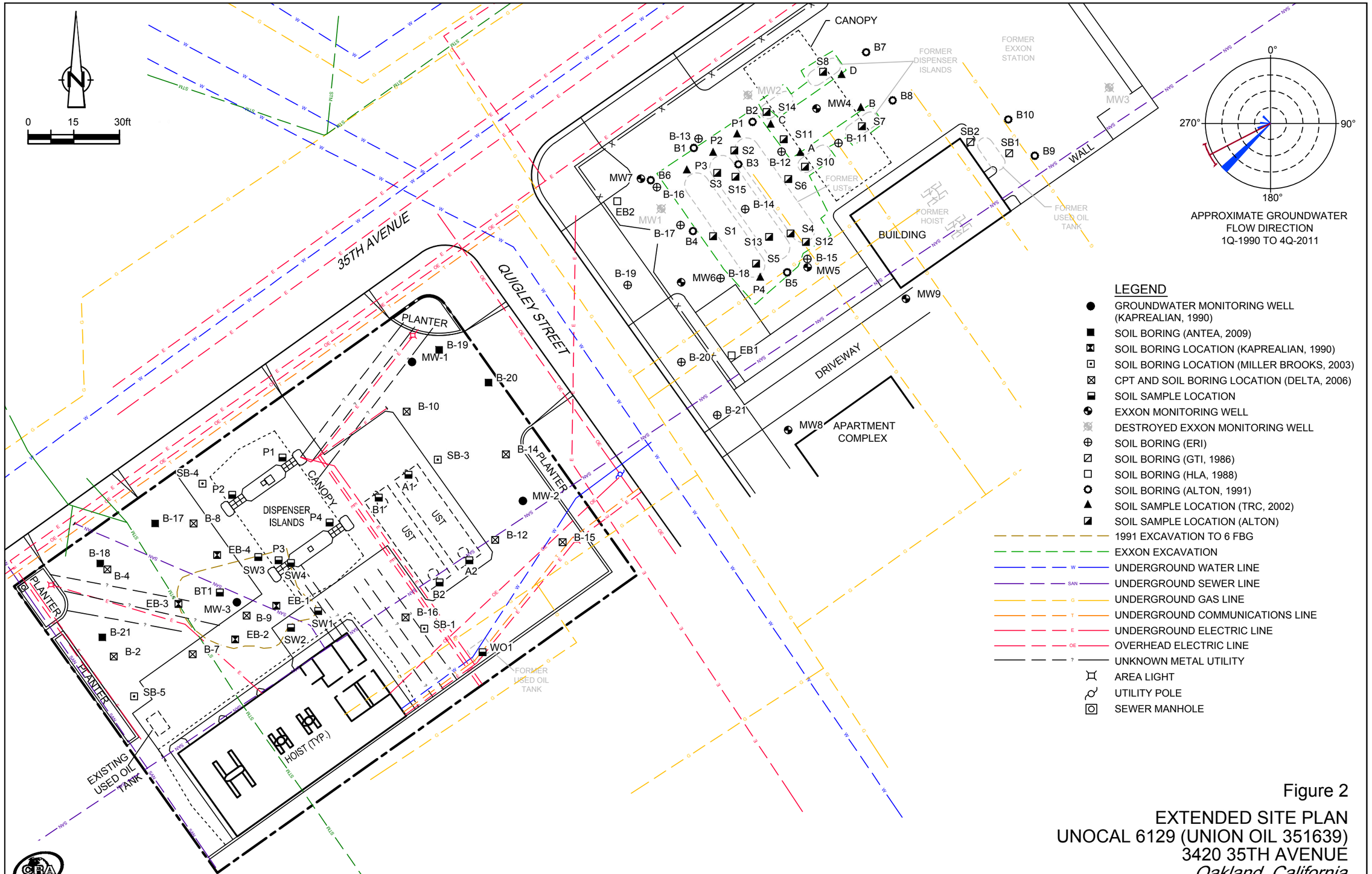


SOURCE: USGS QUADRANGLE MAP: OAKLAND EAST, CA.

Figure 1

VICINITY MAP
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
Oakland, California

60722-2012(004)GN-WA003 APR 24/2012

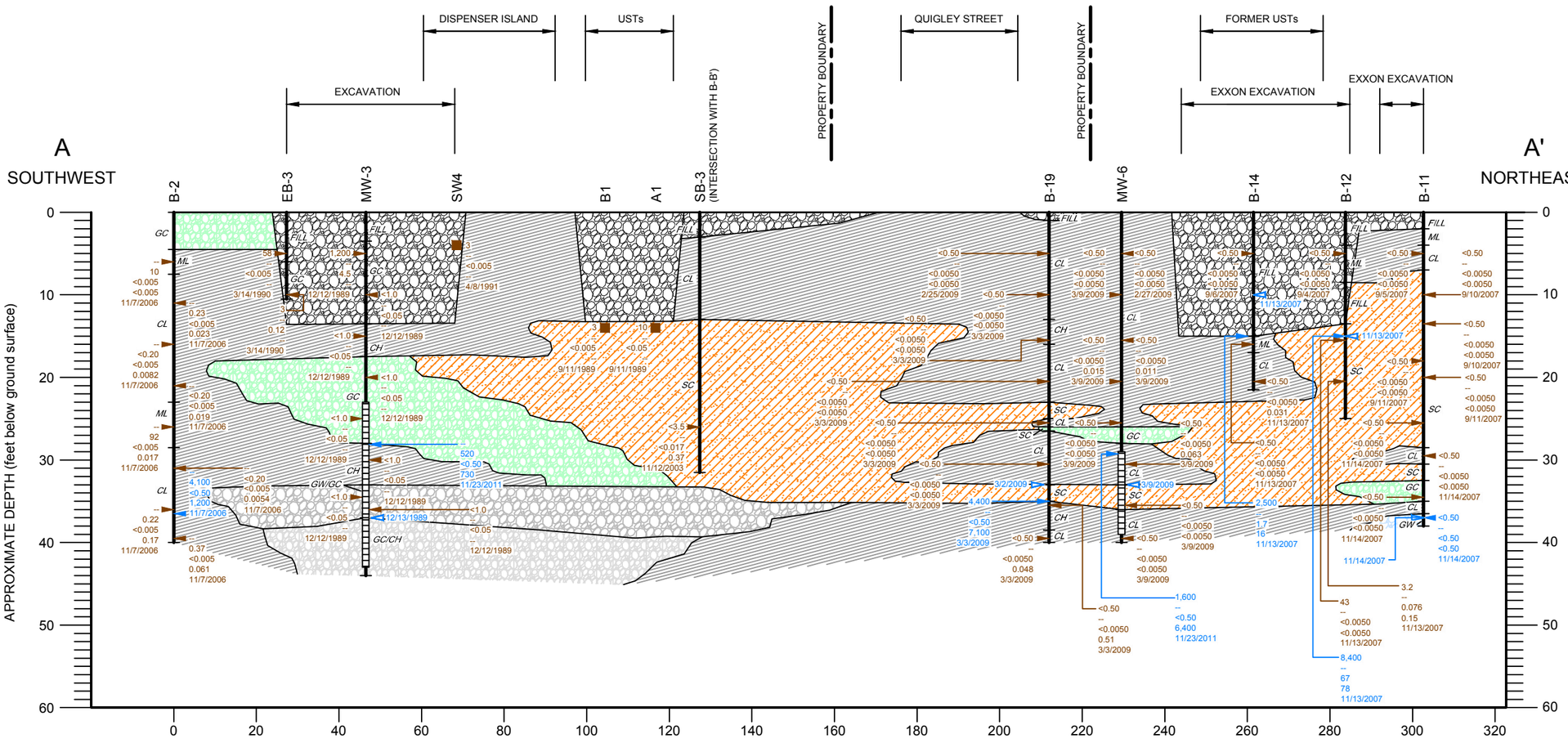


SOURCE: DELTA CONSULTANTS, FIGURE 2, SITE PLAN WITH HISTORIC SAMPLING LOCATIONS , DATED 11/02/2009.

Figure 2

EXTENDED SITE PLAN
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
Oakland, California

60722-2012(004)GN-WA001 APR 26/2012



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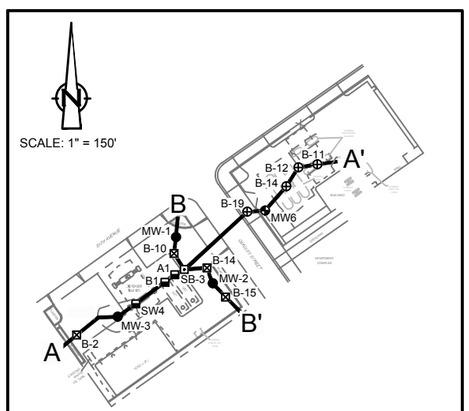
VERT. 1" = 15'



SOURCE: DELTA CONSULTANTS, FIGURE 2, SITE PLAN WITH HISTORIC SAMPLING LOCATIONS , DATED 11/02/2009.

LEGEND

- MW-3 — WELL DESIGNATION
- GROUND SURFACE
- OBSERVATION WELL INSTALLATION
- STRATIGRAPHIC BOUNDARY
- CH — TYPICAL SOIL CLASSIFICATION
- SCREENED INTERVAL
- BOTTOM OF BORING
- TPHg / TPPH / BENZENE / MTBE / DATE — APPROXIMATE SOIL SAMPLE LOCATION; HYDROCARBON CONCENTRATIONS IN SOIL IN MILLIGRAMS PER KILOGRAM (mg/kg)
- TPHg / TPPH / BENZENE / MTBE / DATE — APPROXIMATE GROUNDWATER SAMPLE LOCATION; HYDROCARBON CONCENTRATIONS IN GROUNDWATER IN MICROGRAMS PER LITER (µg/L)

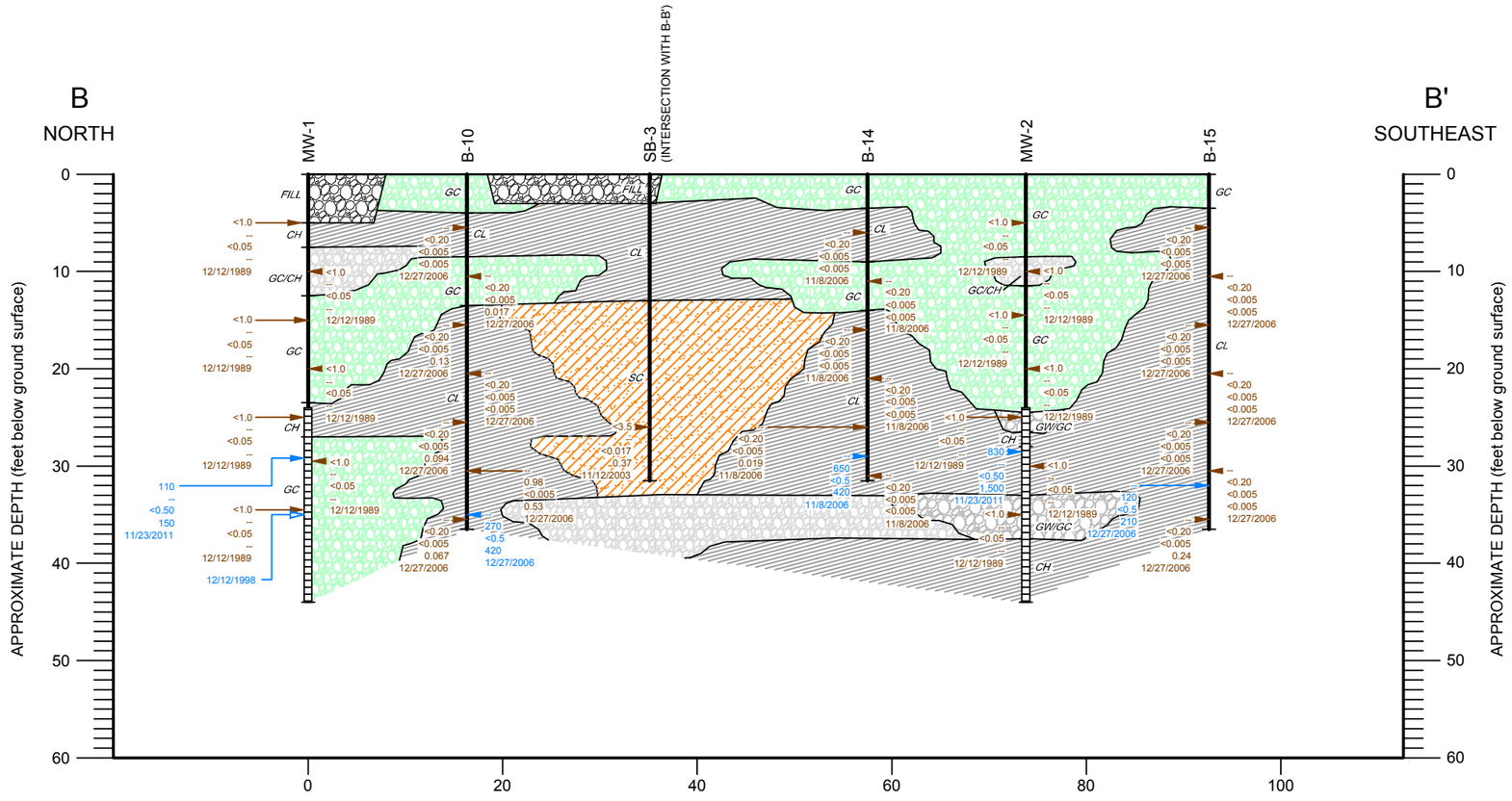
- *FILL*
- *ML* - INORGANIC SILTS, CLAYEY SILT, CLAYEY SILT WITH SAND, SILT WITH SAND, SANDY SILT WITH CLAY
- *CL* - INORGANIC CLAYS, GRAVELLY CLAY, SANDY CLAY, SILTY CLAY, CLAY WITH SAND, SILTY CLAY WITH SAND
- *CH* - INORGANIC CLAYS, GRAVELLY CLAY, SANDY CLAY, CLAY WITH SAND
- *SC* - CLAYEY SAND WITH GRAVEL, CLAYEY SAND
- *GC* - CLAYEY GRAVELS, CLAYEY GRAVEL WITH SAND
- *GW/GC* - WELL GRADED GRAVEL WITH CLAY AND SAND
- *GC/CH* - CLAYEY GRAVEL
- *GW* - SANDY GRAVEL

- ■ SOIL SAMPLING POINT
- DATE — FIRST ENCOUNTERED GROUNDWATER LOCATION
- -- NOT ANALYZED
- TPHg TOTAL PETROLEUM HYDROCARBON AS GASOLINE
- TPPH TOTAL PURGEABLE PETROLEUM HYDROCARBON
- MTBE METHYL TERTIARY BUTYL ETHER

Figure 3

GEOLOGIC CROSS-SECTION A-A'
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
Oakland, California

60722-2012(004)GN-WA005 APR 26/2012



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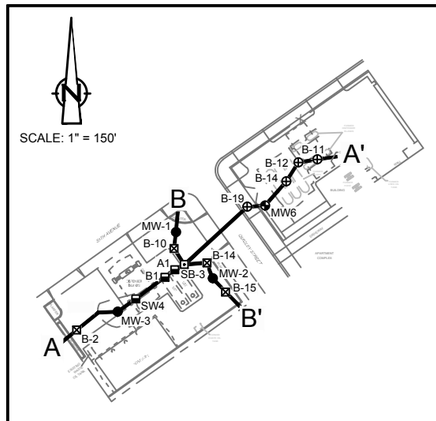


SOURCE: DELTA CONSULTANTS, FIGURE 2, SITE PLAN WITH HISTORIC SAMPLING LOCATIONS , DATED 11/02/2009.

LEGEND

- MW-1 — WELL DESIGNATION
- GROUND SURFACE
- OBSERVATION WELL INSTALLATION
- STRATIGRAPHIC BOUNDARY
- CH — TYPICAL SOIL CLASSIFICATION
- SCREENED INTERVAL
- BOTTOM OF BORING
- TPHg / TPPH / BENZENE / MTBE / DATE — APPROXIMATE SOIL SAMPLE LOCATION; HYDROCARBON CONCENTRATIONS IN SOIL IN MILLIGRAMS PER KILOGRAM (mg/kg)
- TPHg / TPPH / BENZENE / MTBE / DATE — APPROXIMATE GROUNDWATER SAMPLE LOCATION; HYDROCARBON CONCENTRATIONS IN GROUNDWATER IN MICROGRAMS PER LITER (µg/L)

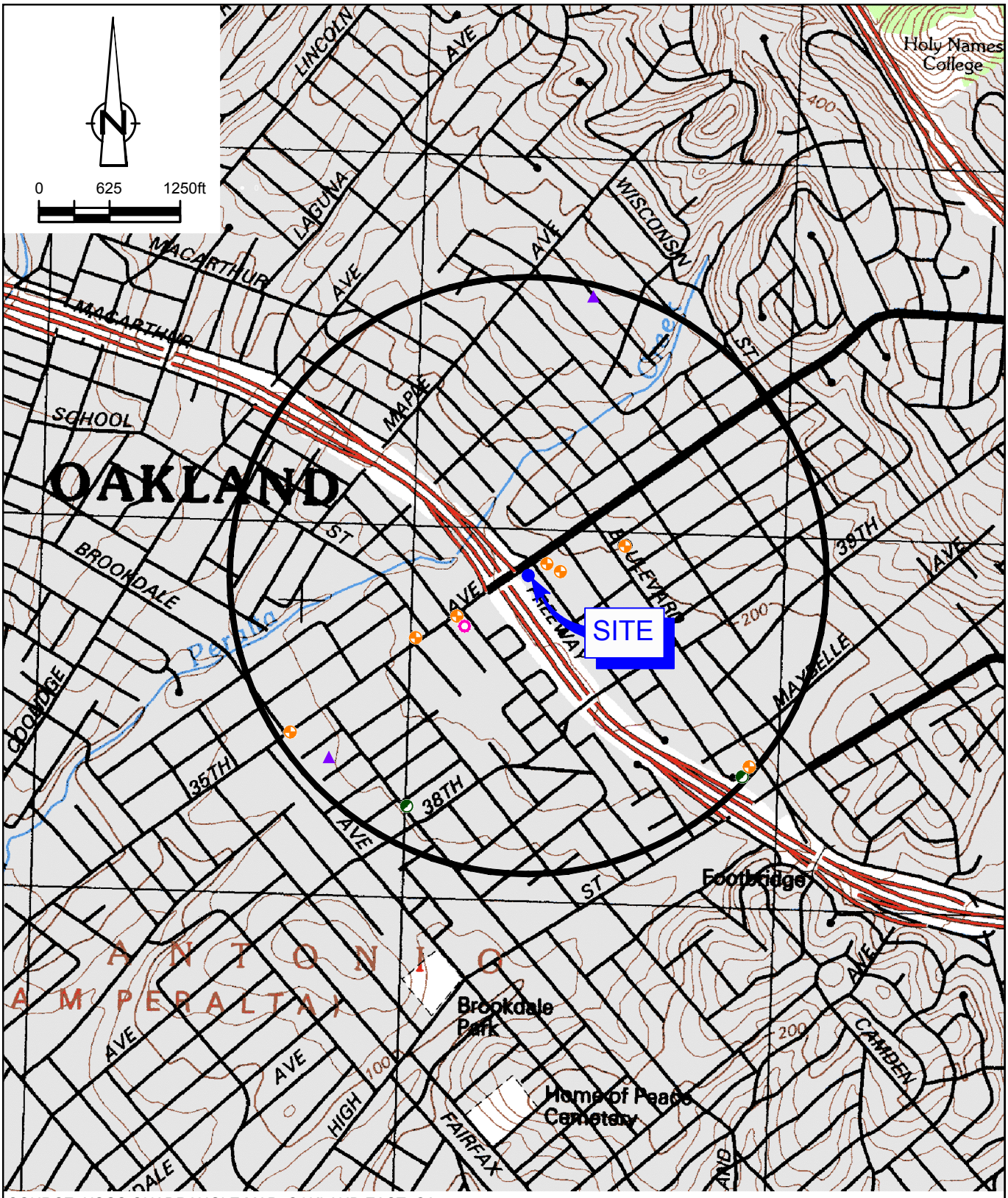
- *FILL*
- *CL* - INORGANIC CLAYS, GRAVELLY CLAY, SANDY CLAY, CLAY WITH SAND
- *CH* - INORGANIC CLAYS, GRAVELLY CLAY, SANDY CLAY
- *SC* - CLAYEY SAND WITH GRAVEL
- *GC* - CLAYEY GRAVELS, CLAYEY GRAVEL WITH SAND
- *GW/GC* - GRAVEL WITH CLAY AND SAND
- *GC/CH* - CLAYEY GRAVEL
- DATE — FIRST ENCOUNTERED GROUNDWATER LOCATION

--	NOT ANALYZED
TPHg	TOTAL PETROLEUM HYDROCARBON AS GASOLINE
TPPH	TOTAL PURGEABLE PETROLEUM HYDROCARBON
MTBE	METHYL TERTIARY BUTYL ETHER

Figure 4

GEOLOGIC CROSS-SECTION B-B'
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
Oakland, California

60722-2012(004)GN-WA005 APR 24/2012



SOURCE: USGS QUADRANGLE MAP: OAKLAND EAST, CA.

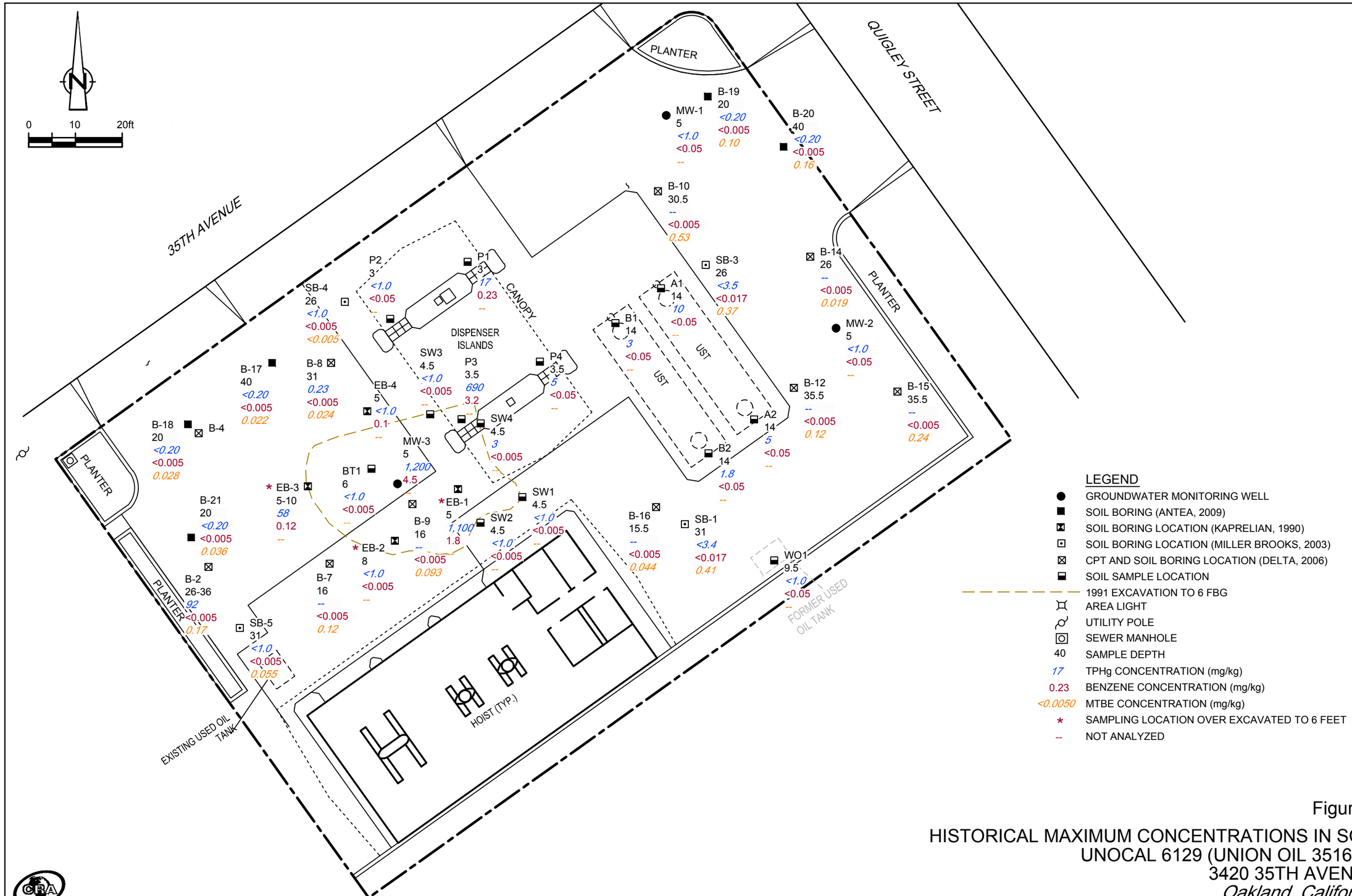
LEGEND

- IRRIGATION WELL
- CATHODIC WELL
- MONITORING WELL
- RECOVERY WELL

Figure 5

WELL SURVEY RESULTS
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
Oakland, California

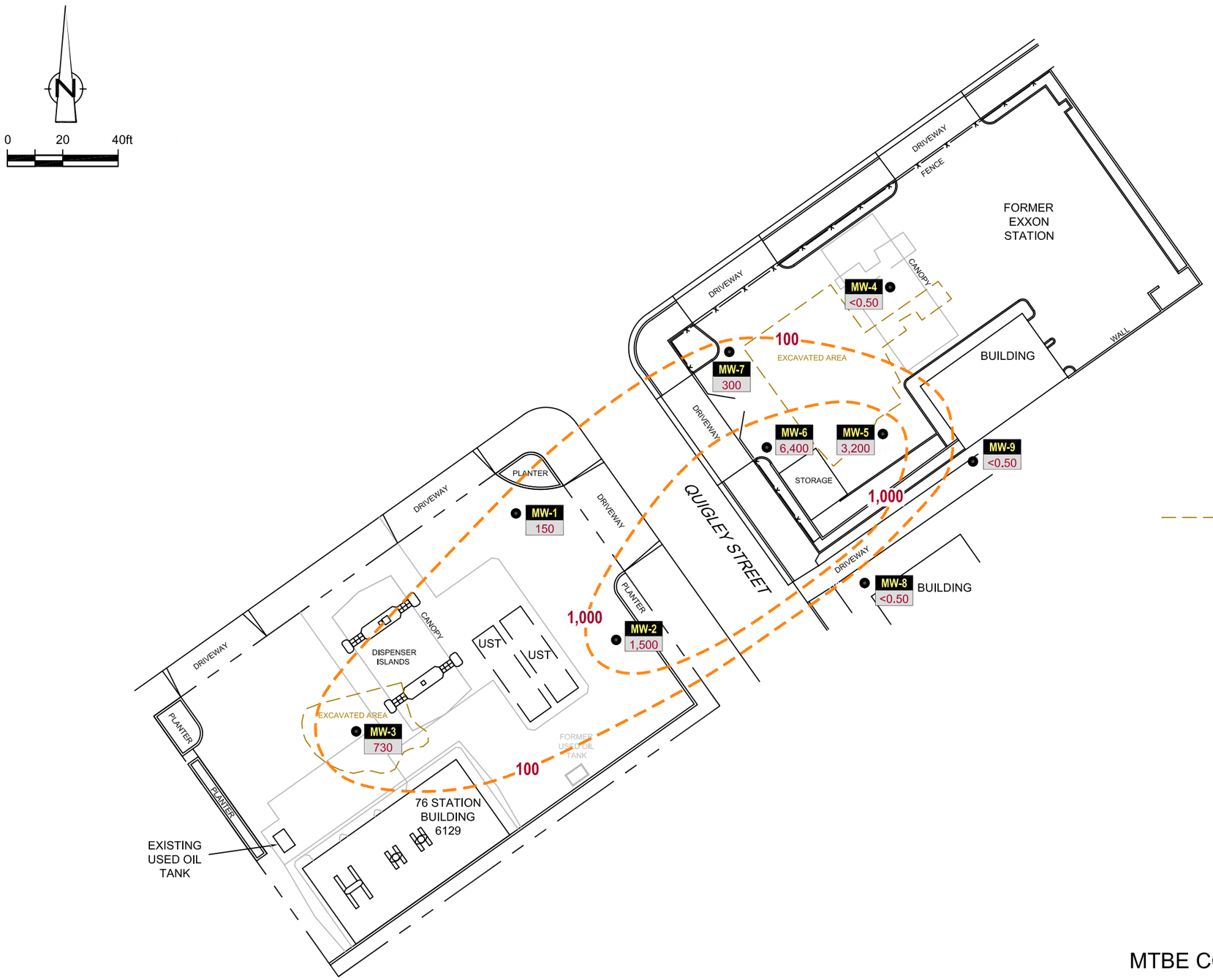
60722-2012(004)GN-WA002 APR 24/2012

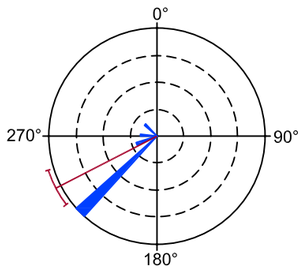


SOURCE: DELTA CONSULTANTS, FIGURE 2, SITE PLAN WITH HISTORIC SAMPLING LOCATIONS , DATED 11/02/2009.

Figure 6

HISTORICAL MAXIMUM CONCENTRATIONS IN SOIL
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
Oakland, California





APPROXIMATE GROUNDWATER
FLOW DIRECTION
1Q-1990 TO 4Q-2011

LEGEND

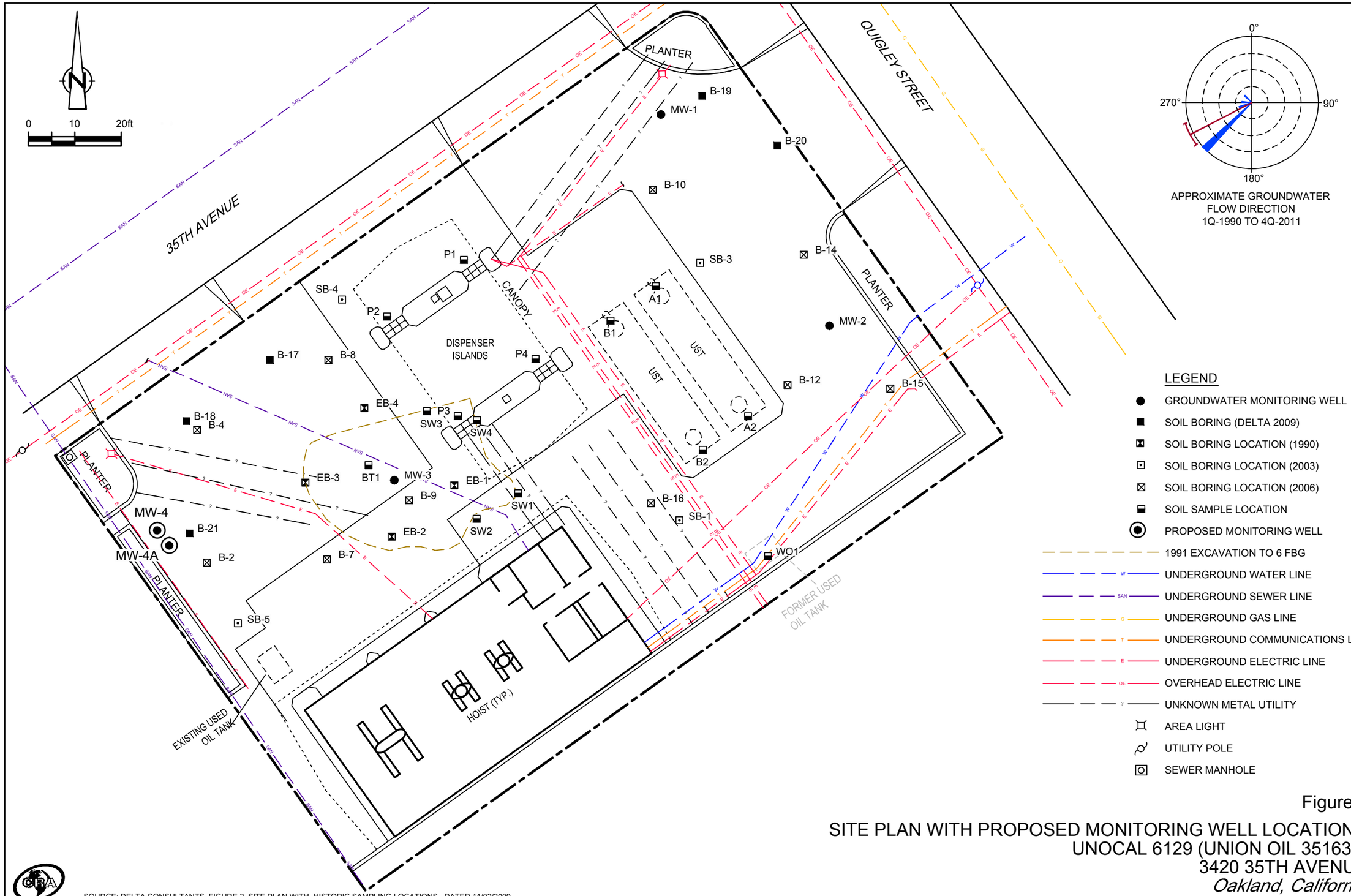
- GROUNDWATER MONITORING WELL
- 1991 EXCAVATION TO 6 FBG
- 100 — MTBE CONCENTRATION CONTOUR LINE, IN MICROGRAMS PER LITER (µg/L), DASHED WHERE INFERRED
- WELL / MTBE — WELL DESIGNATION / MTBE CONCENTRATION (µg/L)

SOURCE: DELTA CONSULTANTS, FIGURE 2, SITE PLAN WITH HISTORIC SAMPLING LOCATIONS , DATED 11/02/2009.

Figure 7

MTBE CONCENTRATIONS IN GROUNDWATER
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
Oakland, California
November 23, 2011

060722-95(003)GN-EM007 APR 24/2012



SOURCE: DELTA CONSULTANTS, FIGURE 2, SITE PLAN WITH HISTORIC SAMPLING LOCATIONS , DATED 11/02/2009.

Figure 8

SITE PLAN WITH PROPOSED MONITORING WELL LOCATIONS
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
Oakland, California

60722-2012(004)GN-WA006 APR 24/2012

TABLES

TABLE 1

WELL CONSTRUCTION DETAILS
UNOCAL 6129 (UNION OIL 351639)
3420 35th AVENUE, OAKLAND, CALIFORNIA

Well ID	*Date Installed*	*TOC**	*Total Depth (fbg)*	*Casing Diameter** (inches)*	*Slot Size (inches)*	*Screen Interval (fbg)*	*Filter Pack (fbg)*	*Type*	*Status*
MW-1	12/12/1989	190.79	44	2	0.020	24-44	22-44	Monitoring	Active
MW-2	12/12/1989	190.80	44	2	0.020	24-44	22-44	Monitoring	Active
MW-3	12/13/1989	188.58	44	2	0.020	23-43	21-43	Monitoring	Active

Abbreviations & Notes:

TOC = Top of casing elevation (feet above mean sea level)

* = Elevations are based on Survey Data from Morrow Surveying (11/10/2009)

** = Casing material: Schedule 40 PVC

fbg = Feet below grade

TABLE 2

GROUNDWATER MONITORING AND SAMPLING DATA
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE, OAKLAND, CALIFORNIA

Well ID	*Date Sampled*	*TOC Elevation (feet)*	*Depth to Water (feet)*	*Ground-Water Elevation (feet)*	*TPHg (8015) ()*	*TPHg (8260) (µg/l)*	*Benzene (µg/l)*	*Toluene (µg/l)*	*Ethyl-benzene (µg/l)*	*Total Xylenes (µg/l)*	*MTBE (µg/l)*	*TBA (µg/l)*	*Ethanol (µg/l)*	*EDB (µg/l)*	*1,2-DCA (µg/l)*	*DIPE (µg/l)*	*ETBE (µg/l)*	*TAME (µg/l)*
MW-1	1/5/1990	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	5/11/1990	--	--	--	ND	--	ND	7.1	ND	ND	--	--	--	--	--	--	--	--
	8/9/1990	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	11/14/1990	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	2/12/1991	--	--	--	ND	--	0.32	ND	ND	ND	--	--	--	--	--	--	--	--
	5/9/1991	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	11/13/2003	--	--	--	--	180	<1.0	<1.0	<1.0	<2.0	240	<200	<1000	<4.0	<4.0	<4.0	<4.0	<4.0
	8/27/2004	190.79	30.65	71.59	--	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<50	<0.50	<0.50	<1.0	<0.50	<0.50
	11/23/2004	190.79	29.35	72.89	--	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<50	<0.50	<0.50	<1.0	<0.50	<0.50
	2/9/2005	190.79	26.89	75.35	--	<50	<0.50	<0.50	<0.50	<1.0	9.3	<5.0	<50	<0.50	<0.50	<0.50	<0.50	<0.50
	5/17/2005	190.79	26.56	75.68	--	<50	<0.50	<0.50	<0.50	<1.0	1.9	<5.0	<50	<0.50	<0.50	<0.50	<0.50	<0.50
	7/27/2005	190.79	27.33	74.91	--	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<50	<0.50	<0.50	<0.50	<0.50	<0.50
	12/6/2005	190.79	29.59	72.65	--	<50	<0.50	0.93	<0.50	1.8	<0.50	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	2/21/2006	190.79	28.27	73.97	--	<50	<0.50	<0.50	<0.50	<1.0	2.6	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	6/8/2006	190.79	26.07	76.17	--	<50	<0.50	<0.50	<0.50	<1.0	11	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	9/15/2006	190.79	28.86	73.38	--	<50	<0.50	<0.50	<0.50	<0.50	1.4	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	12/14/2006	190.79	29.49	72.75	--	<50	<0.50	<0.50	<0.50	<0.50	3.5	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	3/28/2007	190.79	27.24	75.00	--	<50	<0.50	<0.50	<0.50	<0.50	0.64	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	6/25/2007	190.79	28.30	73.94	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	9/22/2007	190.79	30.61	71.63	--	<50	<0.50	<0.50	<0.50	<0.50	4.1	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	12/14/2007	190.79	30.30	71.94	--	<50	<0.50	<0.50	<0.50	<1.0	0.65	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	3/17/2008	190.79	27.22	75.02	--	<50	<0.50	<0.50	<0.50	<1.0	14	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	6/20/2008	190.79	30.10	72.14	--	<50	<0.50	<0.50	<0.50	<1.0	11	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	9/11/2008	190.79	31.04	71.20	--	<50	<0.50	<0.50	<0.50	<1.0	1.3	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	11/25/2008	190.79	30.88	71.36	--	<50	<0.50	<0.50	<0.50	<1.0	5.8	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	3/9/2009	190.79	27.50	74.74	--	<50	<0.50	<0.50	<0.50	<1.0	25	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	5/28/2009	190.79	28.25	73.99	--	<50	<0.50	<0.50	<0.50	<1.0	17	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	12/11/2009	190.79	30.60	160.19	--	<50	<0.50	<0.50	<0.50	<1.0	18	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	5/7/2010	190.79	26.06	164.73	--	67	<0.50	<0.50	<0.50	<1.0	64	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	11/1/2010	190.79	30.18	160.61	--	<50	<0.50	<0.50	<0.50	<1.0	92	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	5/27/2011	190.79	26.87	163.92	--	110	<0.50	<0.50	<0.50	<1.0	220	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	11/23/2011	190.79	29.14	161.65	--	110[1]	<0.50	<0.50	<0.50	<1.0	150	41	<250	<0.50	<0.50	<0.50	<0.50	<0.50
MW-2	1/5/1990	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	5/11/1990	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	8/9/1990	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	11/14/1990	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	2/12/1991	--	--	--	ND	--	ND	0.42	ND	0.51	--	--	--	--	--	--	--	--
	5/9/1991	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	11/13/2003	--	--	--	--	<2000	<20	<20	<20	<40	2100	<4000	<20000	<80	<80	<80	<80	<80

TABLE 2

GROUNDWATER MONITORING AND SAMPLING DATA
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE, OAKLAND, CALIFORNIA

Well ID	Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	Ground-Water Elevation (feet)	TPHg (8015) ()	TPHg (8260) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (µg/l)	TBA (µg/l)	Ethanol (µg/l)	EDB (µg/l)	1,2-DCA (µg/l)	DIPE (µg/l)	ETBE (µg/l)	TAME (µg/l)
	8/27/2004	190.80	30.28	71.88	--	950	<5.0	<5.0	<5.0	<10	1400	<5.0	<500	<5.0	<5.0	24	<5.0	<5.0
	11/23/2004	190.80	28.75	73.41	--	53	<0.50	<0.50	<0.50	<1.0	4.2	<5.0	<50	<0.50	<0.50	18	<0.50	<0.50
	2/9/2005	190.80	26.08	76.08	--	<500	<0.50	<0.50	<0.50	<1.0	400	<5.0	<500	<5.0	<5.0	19	<5.0	<5.0
	5/17/2005	190.80	24.53	77.63	--	<50	<0.50	<0.50	<0.50	<1.0	330	<5.0	<50	<0.50	<0.50	12	<0.50	<0.50
	7/27/2005	190.80	27.51	74.65	--	<500	<5.0	<5.0	<5.0	<10	580	140	<500	<5.0	<5.0	16	<5.0	<5.0
	12/6/2005	190.80	29.13	73.03	--	340	<0.50	<0.50	<0.50	<1.0	780	61	<250	<0.50	<0.50	15	<0.50	<0.50
	2/21/2006	190.80	29.23	72.93	--	190	<0.50	<0.50	<0.50	<1.0	340	<10	<250	<0.50	<0.50	18	<0.50	<0.50
	6/8/2006	190.80	25.76	76.40	--	<500	<5.0	<5.0	<5.0	<10	440	<100	<2500	<5.0	<5.0	14	<5.0	<5.0
	9/15/2006	190.80	29.17	72.99	--	<500	<5.0	<5.0	<5.0	<5.0	570	<100	<2500	<5.0	<5.0	17	<5.0	<5.0
	12/14/2006	190.80	29.11	73.05	--	520	<0.50	<0.50	<0.50	<0.50	770	27	<250	<0.50	<0.50	20	<0.50	<0.50
	3/28/2007	190.80	26.68	75.48	--	290	<0.50	<0.50	<0.50	<0.50	460	260	<250	<0.50	<0.50	23	<0.50	<0.50
	6/25/2007	190.80	25.91	76.25	--	<50	<0.50	<0.50	<0.50	<0.50	1.2	<10	<250	<0.50	<0.50	23	<0.50	<0.50
	9/22/2007	190.80	30.18	71.98	--	400	<0.50	<0.50	<0.50	<0.50	530	<10	<250	<0.50	<0.50	35	<0.50	<0.50
	12/14/2007	190.80	29.96	72.20	--	400	<0.50	<0.50	<0.50	<1.0	930	48	<250	<0.50	<0.50	24	<0.50	<0.50
	3/17/2008	190.80	26.74	75.42	--	570	<5.0	<5.0	<5.0	<10	630	<100	<2500	<5.0	<5.0	18	<5.0	<5.0
	6/20/2008	190.80	29.78	72.38	--	580	<0.50	<0.50	<0.50	<1.0	1200	<10	<250	<0.50	<0.50	16	<0.50	<0.50
	9/11/2008	190.80	30.62	71.54	--	220	<0.50	<0.50	<0.50	<1.0	29	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	11/25/2008	190.80	30.48	71.68	--	500	<0.50	<0.50	<0.50	<1.0	1500	<10	<250	<0.50	<0.50	19	<0.50	<0.50
	3/9/2009	190.80	25.75	76.41	--	910	<5.0	<5.0	<5.0	<10	1400	<100	<2500	<5.0	<5.0	15	<5.0	<5.0
	5/28/2009	190.80	27.71	74.45	--	460	<0.50	<0.50	<0.50	<1.0	740	<10	<250	<0.50	<0.50	20	<0.50	<0.50
	12/11/2009	190.80	29.80	161.00	--	640	<5.0	<5.0	<5.0	<10	1300	<100	<2500	<5.0	<5.0	19	<5.0	<5.0
	5/7/2010	190.80	25.11	165.69	--	600	<1.0	<1.0	<1.0	<2.0	940	<20	<500	<1.0	<1.0	14	<1.0	<1.0
	11/1/2010	190.80	29.90	160.90	--	140	<0.50	<0.50	<0.50	<1.0	730	<10	<250	<0.50	<0.50	28	<0.50	<0.50
	5/27/2011	190.80	26.44	164.36	--	560	<0.50	<0.50	<0.50	<1.0	1,100	210	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	11/23/2011	**190.80**	**28.53**	**162.27**	--	**830**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**1,500**	400	<250	<0.50	<0.50	9.0	<0.50	<0.50
MW-3	1/5/1990	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	5/11/1990	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	8/9/1990	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	11/14/1990	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	2/12/1991	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	5/9/1991	--	--	--	ND	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--
	11/13/2003	--	--	--	--	2600	<20	<20	<20	<40	3700	<4000	<20000	<80	<80	<80	<80	<80
	8/27/2004	**188.58**	29.61	70.39	--	1700	<10	<10	<10	<20	2600	<100	<1000	<10	<10	<20	<10	<10
	11/23/2004	**188.58**	28.48	71.52	--	1500	<10	<10	<10	<20	1800	<100	<1000	<10	<10	<20	<10	<10
	2/9/2005	**188.58**	26.45	73.55	--	<1000	<0.50	<0.50	<0.50	<1.0	2100	130	<1000	<10	<10	<10	<10	<10
	5/17/2005	**188.58**	25.61	74.39	--	<1000	<0.50	<0.50	<0.50	<1.0	1200	<100	<1000	<10	<10	<10	<10	<10
	7/27/2005	**188.58**	27.35	72.65	--	<1000	<10	<10	<10	<20	1400	360	<1000	<10	<10	<10	<10	<10
	12/6/2005	**188.58**	28.78	71.22	--	430	<0.50	1.6	<0.50	3.6	1800	160	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	2/21/2006	**188.58**	28.91	71.09	--	420	<0.50	<0.50	<0.50	<1.0	1100	88	<250	<0.50	<0.50	<0.50	<0.50	0.58

TABLE 2

GROUNDWATER MONITORING AND SAMPLING DATA
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE, OAKLAND, CALIFORNIA

Well ID	*Date Sampled*	*TOC Elevation (feet)*	*Depth to Water (feet)*	*Ground-Water Elevation (feet)*	*TPHg (8015) ()*	*TPHg (8260) (µg/l)*	*Benzene (µg/l)*	*Toluene (µg/l)*	*Ethyl-benzene (µg/l)*	*Total Xylenes (µg/l)*	*MTBE (µg/l)*	*TBA (µg/l)*	*Ethanol (µg/l)*	*EDB (µg/l)*	*1,2-DCA (µg/l)*	*DIPE (µg/l)*	*ETBE (µg/l)*	*TAME (µg/l)*
	6/8/2006	**188.58**	25.97	74.03	--	<1200	<12	<12	<12	<25	1000	<250	<6200	<12	<12	<12	<12	<12
	9/15/2006	**188.58**	28.73	71.27	--	<1200	<12	<12	<12	<12	1200	<250	<6200	<12	<12	<12	<12	<12
	12/14/2006	**188.58**	28.62	71.38	--	<1000	<10	<10	<10	<10	1300	<200	<5000	<10	<10	<10	<10	<10
	3/28/2007	**188.58**	26.69	73.31	--	500	<1.0	<1.0	<1.0	<1.0	860	500	<500	<1.0	<1.0	<1.0	<1.0	<1.0
	6/25/2007	**188.58**	26.74	73.26	--	270	<0.50	<0.50	<0.50	<0.50	570	11	<250	<0.50	0.65	<0.50	<0.50	<0.50
	9/22/2007	**188.58**	29.57	70.43	--	500	<0.50	<0.50	<0.50	<0.50	980	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	12/14/2007	**188.58**	29.30	70.70	--	270	<0.50	<0.50	<0.50	<1.0	570	26	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	3/17/2008	**188.58**	26.82	73.18	--	220	<0.50	<0.50	<0.50	<1.0	520	<10	<250	<0.50	0.65	<0.50	<0.50	<0.50
	6/20/2008	**188.58**	29.10	70.90	--	490	<0.50	<0.50	<0.50	<1.0	1300	49	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	9/11/2008	**188.58**	29.89	70.11	--	630	<5.0	<5.0	<5.0	<10	1200	<100	<2500	<5.0	<5.0	<5.0	<5.0	<5.0
	11/25/2008	**188.58**	29.74	70.26	--	380	<0.50	<0.50	<0.50	<1.0	870	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	3/9/2009	**188.58**	25.56	74.44	--	310	<0.50	<0.50	<0.50	<1.0	720	15	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	5/28/2009	**188.58**	27.55	72.45	--	410	<0.50	<0.50	<0.50	<1.0	750	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	12/11/2009	188.58	29.10	159.48	--	220	<0.50	<0.50	<0.50	<1.0	620	63	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	5/7/2010	188.58	25.72	162.86	--	360	<0.50	<0.50	<0.50	<1.0	660	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	11/1/2010	188.58	29.29	159.29	--	120	<0.50	<0.50	<0.50	<1.0	490	<10	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	5/27/2011	188.58	26.53	162.05	--	340	<0.50	<0.50	<0.50	<1.0	890	73	<250	<0.50	<0.50	<0.50	<0.50	<0.50
	11/23/2011	**188.58**	**28.11**	**160.47**	--	**520**[1]	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**730**	170	<250	<0.50	<0.50	<0.50	<0.50	<0.50

Abbreviations and Notes:

TOC = Top of casing

µg/L = Micrograms per liter

TPHg = Total petroleum hydrocarbons as gasoline by EPA Method 8015 and 8260

Benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8260B

MTBE = Methyl tertiary butyl ether by EPA Method 8260B

TBA= tertiary butyl alcohol by EPA Method 8260B

DIPE= di-isopropyl ether by EPA Method 8260B

ETBE= ethyl tertiary butyl ether by EPA Method 8260B

TAME= tertiary amyl methyl ether by EPA Method 8260B

1,2-DCA= 1,2-Dichloroethane by EPA Method 8260B

EDB= 1,2-Dibromoethane by EPA Method 8260B

Lead = Total lead by Method 6010

Ethanol by EPA Method 8260B

-- = Not available / not applicable

<x = Not detected at or above laboratory method detection limit indicated

ND = Not detected, detection limit not known

1 = TPHg does not exhibit a "gasoline" pattern, is entirely due to MTBE

TABLE 3

WELL SURVEY SUMMARY
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
OAKLAND, CALIFORNIA

Type of Well	*Approximate Distance from Site (miles)*	*Owner*	*Address*	*Date Installed*	*Total Depth (feet)*
MON	0.05	TEXACO STA. # 6248000193	3450 35th Ave.	6/1/1988	25
MON	0.05	TEXACO STA. # 6248000193	3450 35th Ave.	6/1/1988	25
MON	0.05	Exxon Co. MW-1	3450 35th Ave.	7/1992	45
MON	0.05	Exxon Co. MW-2	3450 35th Ave.	7/1992	45
MON	0.05	Exxon Co. MW-3	3450 35th Ave.	7/1992	45
MON	0.05	Exxon Company USA	3450 35th Av	10/1/1994	14
MON	0.05	ExxonMobil Oil Corporation	3518 Quigley St	3/4/2009	40
MON	0.05	ExxonMobil Oil Corporation	3518 Quigley St	2/18/2009	40
MON	0.05	ExxonMobil Oil Corporation	3450 35th Ave	3/2/2009	40
MON	0.05	ExxonMobil Oil Corporation	3450 35th Ave	3/5/2009	42
MON	0.05	ExxonMobil Oil Corporation	3450 35th Ave	3/9/2009	40
MON	0.05	ExxonMobil Oil Corporation	3450 35th Ave	3/9/2009	40
IRR	0.12	ARTHUR SMITH	3397 Arkansas St	8/1977	62
REC	0.13	BP Oil Company	3201 35th Ave	1/1990	40
MON	0.13	BP Oil Company	3201 35th Ave	1/1990	40
MON	0.13	BP Oil Company	3201 35th Ave	2/1990	35
MON	0.13	BP Oil Company	3201 35th Ave	2/1990	35
MON	0.13	BP Oil Company	3201 35th Ave	3/1991	25
MON	0.13	BP Oil Company	3201 35th Ave	5/1991	25
MON	0.13	BP Oil Company	3201 35th Ave	2/1991	40
MON	0.13	MOBIL OIL CORP	3201 35th Ave	7/1/1986	45
MON	0.13	MOBIL OIL CORP	3201 35th Ave	7/1/1986	35
MON	0.13	MOBIL OIL CORP	3201 35th Ave	7/1/1986	35
MON	0.17	Wanetta Hall	3600 MacArthur Blvd	11/1/1998	14
MON	0.17	Wanetta Hall	3600 MacArthur Blvd	11/1/1998	14
MON	0.17	Wanetta Hall	3600 MacArthur Blvd	11/1/1998	14
MON	0.21	Lynn Worthington	3055 35th Av	2/1997	30

TABLE 3

WELL SURVEY SUMMARY
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
OAKLAND, CALIFORNIA

Type of Well	*Approximate Distance from Site (miles)*	*Owner*	*Address*	*Date Installed*	*Total Depth (feet)*
MON	0.21	Lynn Worthington	3055 35th Av	5/1994	25
MON	0.21	Lynn Worthington	3055 35th Av	5/1994	25
MON	0.21	Lynn Worthington	3055 35th Av	5/1994	25
CAT	0.43	PG&E	Allendale and Viola	2/1975	120
IRR	0.44	C. GRAVAHLO	2719 Octavia	?	60
MON	0.47	SAAB Saver	2601 35th Av	12/1/1995	25
MON	0.47	SAAB Saver	2601 35th Av	12/1/1995	23
MON	0.47	SAAB Saver	2601 35th Av	12/1/1995	25
CAT	0.48	PG&E	Redding St	5/1973	120
IRR	0.51	STEVEN C. OLSEN	3062 Arizona St	1/1978	30
MON	0.55	Shell Oil Company	4255 MacArthur Blvd	11/1/1993	23
MON	0.55	Shell Oil Company	4255 MacArthur Blvd	11/1/1993	20
MON	0.55	Shell Oil Company	4255 MacArthur Blvd	11/1/1993	22
MON	0.55	Shell Oil Company	4255 MacArthur Blvd	11/1/1994	31
MON	0.55	Shell Oil Company	4255 MacArthur Blvd	11/1/1993	22
MON	0.55	Shell Oil Company	4255 MacArthur Blvd	11/1/1993	20
MON	0.55	Shell Oil Company	4255 MacArthur Blvd	11/1/1993	22

Notes:
IRR=Irrigation well
CAT=Cathodic well
DES=well destroyed (through permit)
MON= Monitoring well
REC=Recovery well (extraction/ vapor)
? = Unknown or no information found or given

TABLE 4

SOIL ANALYTICAL DATA
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
OAKLAND, CA

Sample ID	*Depth (fbg)*	*Date*	*TPHg*	*TPHd*	*TPPH*	*TOG*	*Benzene*	*Toluene*	*Ethylbenzene*	*Total Xylenes*	*MTBE*	*Lead*	*TBA*	*DIPE*	*ETBE*	*TAME*	*Ethanol*	*1,2-DCA*	*EDB*
										(concetrations in mg/kg)									
	Gasoline UST Removal																		
A1	14	9/11/1989	**10**	--	--	--	<0.05	<0.05	<0.05	**0.11**	--	--	--	--	--	--	--	--	--
A2	14	9/11/1989	**5**	--	--	--	<0.05	<0.05	<0.05	<0.05	--	--	--	--	--	--	--	--	--
B1	14	9/11/1989	**3**	--	--	--	<0.05	<0.05	<0.05	<0.05	--	--	--	--	--	--	--	--	--
B2	14	9/11/1989	**1.8**	--	--	--	<0.05	<0.05	<0.05	<0.05	--	--	--	--	--	--	--	--	--
						--													
	Product Line					--													
P1	3	9/11/1989	**17**	--	--	--	**0.23**	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
P2	3	9/11/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
P3	3.5	9/11/1989	**690**	--	--	--	**3.2**	**0.36**	<0.10	**19**	--	**0.058**	--	--	--	--	--	--	--
P3	7.5	9/11/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
P4	3.5	9/11/1989	**5**	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
						--													
	Used Oil UST					--													
WO1	9.5	9/11/1989	<1.0	**3.3**	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
						--													
	Over-Excavation around MW-3					--													
SW-1	4.5	4/8/1991	<1.0	--	--	--	<0.005	<0.005	**0.068**	<0.005	--	--	--	--	--	--	--	--	--
SW-2	4.5	4/8/1991	<1.0	--	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--
SW-3	4.5	4/8/1991	<1.0	--	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--
SW-4	4.5	4/8/1991	**3**	--	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--
BT-1	6	4/9/1991	<1.0	--	--	--	<0.005	<0.005	<0.005	**0.012**	--	--	--	--	--	--	--	--	--
BT-2	6	4/9/1991	<1.0	--	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--
						--													
	Monitoring Well					--													
						--													
MW-1	5	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	10	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	15	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	20	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	25	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	29.5	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	34.5	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
				--	--	--													
MW-2	5	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	10	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	14.5	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	20	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	25	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--

TABLE 4

SOIL ANALYTICAL DATA
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
OAKLAND, CA

Sample ID	*Depth (fbg)*	*Date*	*TPHg*	*TPHd*	*TPPH*	*TOG*	*Benzene*	*Toluene*	*Ethylbenzene*	*Total Xylenes*	*MTBE*	*Lead*	*TBA*	*DIPE*	*ETBE*	*TAME*	*Ethanol*	*1,2-DCA*	*EDB*
	27	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	30	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	33.5	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	35	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
				--	--	--													
MW-3	5	12/12/1989	**1,200**	--	--	--	**4.5**	**2**	**21**	**6.3**	--	--	--	--	--	--	--	--	--
	10	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	15	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	20	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	25	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	30	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	34.5	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
	36	12/12/1989	<1.0	--	--	--	<0.05	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--	--
						--													
	Soil Borings			--	--	--						--	--	--	--	--	--	--	--
EB1	~~5~~	~~3/14/1990~~	~~**1100**~~	~~--~~	~~--~~	~~--~~	~~**1.8**~~	~~**2.5**~~	~~**10**~~	~~**7**~~	--	--	--	--	--	--	--	--	--
	10	3/14/1990	<1.0	--	--	--	**0.005**	**0.034**	<0.005	<0.005	--	--	--	--	--	--	--	--	--
						--													
EB-2	~~8~~	~~3/14/1990~~	~~**<1.0**~~	~~--~~	~~--~~	~~--~~	~~<0.005~~	~~**0.08**~~	~~<0.005~~	~~<0.005~~	--	--	--	--	--	--	--	--	--
	10	3/14/1990	<1.0	--	--	--	<0.005	**0.07**	<0.005	<0.005	--	--	--	--	--	--	--	--	--
						--													
EB-3	~~5~~	~~3/14/1990~~	~~**58**~~	~~--~~	~~--~~	~~--~~	~~<0.005~~	~~**0.068**~~	~~**0.09**~~	~~**0.31**~~	--	--	--	--	--	--	--	--	--
	10	3/14/1990	**3**	--	--	--	**0.12**	**0.036**	<0.005	**0.0072**	--	--	--	--	--	--	--	--	--
						--													
EB-4	5	3/14/1990	<1.0	--	--	--	**0.1**	**0.06**	**0.013**	**0.024**	--	--	--	--	--	--	--	--	--
	10	3/14/1990	<1.0	--	--	--	<0.005	**0.055**	<0.005	<0.005	--	--	--	--	--	--	--	--	--
						--													
SB-1	31	11/12/2003	<3.4	--	--	<50	<0.017	<0.017	<0.017	<0.017	**0.41**	**3.9**	<0.034	<0.034	<0.017	<0.017	<0.34	--	--
						--													
SB-3	26	11/12/2003	<3.5	--	--	--	<0.017	<0.017	<0.017	<0.017	**0.37**	--	<0.035	<0.035	<0.017	<0.017	<0.35	--	--
						--													
SB-4	26	11/13/2003	<1.0	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	--	<0.010	<0.010	<0.005	<0.005	<0.1	<0.005	<0.005
						--													
SB-5	31	11/13/2003	<1.0	--	--	--	<0.005	<0.005	<0.005	<0.005	**0.055**	**5.8**	<0.005	<0.010	<0.005	<0.005	<0.1	<0.005	<0.005
						--													
B-2	6	11/7/2006	--	--	**10**	--	<0.005	<0.005	**0.0056**	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	11	11/7/2006	--	--	**0.23**	--	<0.005	<0.005	<0.005	<0.010	**0.023**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	16	11/7/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.0082**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	21	11/7/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.019**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	26	11/7/2006	--	--	**92**	--	<0.005	<0.005	<0.005	**0.99**	**0.017**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	31	11/7/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.0054**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	36	11/7/2006	--	--	**0.22**	--	<0.005	<0.005	<0.005	<0.010	**0.17**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--

TABLE 4

SOIL ANALYTICAL DATA
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
OAKLAND, CA

Sample ID	*Depth (fbg)*	*Date*	*TPHg*	*TPHd*	*TPPH*	*TOG*	*Benzene*	*Toluene*	*Ethylbenzene*	*Total Xylenes*	*MTBE*	*Lead*	*TBA*	*DIPE*	*ETBE*	*TAME*	*Ethanol*	*1,2-DCA*	*EDB*
	39.5	11/7/2006	--	--	**0.37**	--	<0.005	<0.005	<0.005	**0.025**	**0.061**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
						--													
B-7	6	11/8/2006	--	--	**220**	--	<0.12	<.0.12	**0.46**	**0.51**	<0.12	--	<5.0	<0.12	<0.025	<0.025	<25	--	--
	10	11/8/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	16	11/8/2006	--	--	**0.25**	--	<0.005	<0.005	<0.005	<0.010	**0.12**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	21	11/8/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.087**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	26	11/8/2006	--	--	**0.22**	--	<0.005	<0.005	<0.005	<0.010	**0.10**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	31	11/8/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.024**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
						--													
B-8	6	11/7/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.051**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	11	11/7/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.051**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	16	11/7/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.041**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	21	11/7/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.029**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	26	11/7/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.050**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	31	11/7/2006	--	--	**0.24**	--	<0.005	<0.005	<0.005	<0.010	**0.24**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	36	11/7/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	39.5	11/7/2006	--	--	**0.24**	--	<0.005	<0.005	<0.005	<0.010	**0.15**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
						--													
B-9	6	11/18/2006	--	--	**0.33**	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	11	11/18/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.014**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	16	11/18/2006	--	--	**0.23**	--	<0.005	<0.005	<0.005	<0.010	**0.093**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	21	11/18/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.046**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
						--												--	--
B-10	5.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	10.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.017**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	15.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.13**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	20.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	25.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.094**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	30.5	12/27/2006	--	--	**0.48**	--	<0.005	<0.005	<0.005	<0.010	**0.53**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	35.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.067**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
						--													
B-12	5.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	10.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	15.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.059**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	20.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.025**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	25.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.052**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	30.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.047**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	35.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.12**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
						--													
B-14	6	11/8/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	11	11/8/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--

TABLE 4

SOIL ANALYTICAL DATA
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
OAKLAND, CA

Sample ID	*Depth (fbg)*	*Date*	*TPHg*	*TPHd*	*TPPH*	*TOG*	*Benzene*	*Toluene*	*Ethylbenzene*	*Total Xylenes*	*MTBE*	*Lead*	*TBA*	*DIPE*	*ETBE*	*TAME*	*Ethanol*	*1,2-DCA*	*EDB*
	16	11/8/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	21	11/8/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	26	11/8/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.019**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	31	11/8/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
						--													
B-15	5.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	10.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	15.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	20.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	25.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	30.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	35.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.24**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
						--													
B-16	5.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	10.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.007**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	15.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.044**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	20.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.017**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	25.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.011**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	30.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	<0.005	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
	35.5	12/27/2006	--	--	<0.20	--	<0.005	<0.005	<0.005	<0.010	**0.015**	--	<0.20	<0.005	<0.0010	<0.0010	<1.0	--	--
						--													
B-17	10	10/23/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	**0.0072**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	20	10/23/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	**0.011**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	30	10/23/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	**0.010**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	40	10/23/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	**0.022**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	50	10/23/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	**0.006**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
B-18	10	10/23/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	<0.005	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	20	10/23/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	**0.028**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	30	10/23/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	**0.022**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	40	10/23/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	<0.005	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	50	10/23/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	**0.018**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
B-19	10	10/26/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	<0.005	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	20	10/26/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	**0.10**	--	**0.067**	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	31	10/26/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	<0.005	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	40	10/26/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	<0.005	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	50	10/26/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	<0.005	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
B-20	10	10/26/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	<0.005	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005

TABLE 4

SOIL ANALYTICAL DATA
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
OAKLAND, CA

Sample ID	*Depth (fbg)*	*Date*	*TPHg*	*TPHd*	*TPPH*	*TOG*	*Benzene*	*Toluene*	*Ethylbenzene*	*Total Xylenes*	*MTBE*	*Lead*	*TBA*	*DIPE*	*ETBE*	*TAME*	*Ethanol*	*1,2-DCA*	*EDB*
	20	10/26/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	<0.005	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	31	10/26/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	<0.005	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	40	10/26/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	**0.16**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	50	10/26/2009	<0.20	--	--	--	<0.005	<0.005	<0.005	<0.01	<0.005	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
B-21	10	10/22/2009	<0.20	--	--	<50	<0.005	<0.005	<0.005	<0.01	**0.024**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	20	10/22/2009	<0.20	--	--	<50	<0.005	<0.005	<0.005	<0.01	**0.036**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	30	10/22/2009	<0.20	--	--	<50	<0.005	<0.005	<0.005	<0.01	**0.035**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	40	10/22/2009	<0.20	--	--	<50	<0.005	<0.005	<0.005	<0.01	<0.005	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005
	50	10/22/2009	<0.20	--	--	<50	<0.005	<0.005	<0.005	<0.01	**0.013**	--	<0.05	<0.005	<0.005	<0.005	<1.0	<0.005	<0.005

Abbreviations/Notes

Results reported in milligrams per kilogram (mg/kg)
TPHg = Total petroleum hydrocarbons as gasoline by EPA Method 8015 Modified or EPA Method 8260B
TPHd= Total petroleum hydrocarbons as diesel
TPPH= Total purgeable petroleum hydrocarbons by EPA Method 8260B
TOG= Total oil and grease by EPA Method 1664
BTEX = Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8260B
MTBE = Methyl tertiary butyl ether by EPA Method 8260B
TBA= tertiary butyl alcohol by EPA Method 8260B
DIPE= di-isopropyl ether by EPA Method 8260B
ETBE= ethyl tertiary butyl ether by EPA Method 8260B
TAME= tertiary amyl methyl ether by EPA Method 8260B
1,2-DCA= 1,2-Dichloroethane by EPA Method 8260B
EDB= 1,2-Dibromoethane by EPA Method 8260B
Lead = Total lead by Method 6010
Ethanol by EPA Method 8260B
~~strikethrough~~ = Sampling point overexcavated
fbg = Feet below grade
mg/kg = Milligrams per kilogram
<x = Not detected at or above laboratory detection limit
- = Not analyzed

TABLE 5

HISTORICAL GRAB-GROUNDWATER ANALYTICAL DATA
UNOCAL 6129 (UNION OIL 351639)
3420 35TH AVENUE
OAKLAND, CA

Sample ID	*Depth (fbg)*	*Date*	*TPHg*	*TPHd*	*TPPH*	*Benzene*	*Toluene*	*Ethylbenzene*	*Total Xylenes*	*MTBE*	*TBA*	*DIPE*	*ETBE*	*TAME*	*Ethanol*
								(concentrations in µg/L)							
B-2	35	11/7/2006	--	--	**4,100**	<0.50	<0.50	**14**	**370**	**1,200**	**80**	<0.50	<0.50	**0.72**	<250
B-7	31	11/8/2006	--	--	**490**	<0.50	<0.50	**4.5**	**1**	**890**	**52**	<0.50	<0.50	<0.50	<250
B-8	37	11/7/2006	--	--	**500**	<0.50	<0.50	<0.50	<0.50	**990**	**85**	<0.50	<0.50	**0.59**	<250
B-9	16	11/18/2006	--	--	<250	<2.5	<2.5	<2.5	**3.6**	**61**	<50	<2.5	<2.5	<2.5	<1,200
B-10	35	12/27/2006	--	--	**270**	<0.50	<0.50	<0.50	<0.50	**420**	**15**	<0.50	<0.50	<0.50	<250
B-12	30	12/27/2006	--	--	**310**	<0.50	<0.50	<0.50	<0.50	**450**	**25**	**7.2**	<0.50	<0.50	<250
B-14	29	11/8/2006	--	--	**650**	<0.50	<0.50	<0.50	<0.50	**2,500**	**180**	**1.2**	<0.50	**0.97**	<250
B-15	32	12/27/2006	--	--	**120**	<0.50	<0.50	<0.50	<0.50	**210**	<10	**4.6**	<0.50	<0.50	<250
B-16	32	12/27/2006	--	--	**120**	<0.50	<0.50	<0.50	<0.50	**180**	<10	**8.4**	<0.50	<0.50	<250

Abbreviations/Notes

Concentrations reported in micrograms per liter (µg/L).
TPHg = Total petroleum hydrocarbons as gasoline by EPA Method 8015 Modified
TPHd= Total Petroleum hydrocarbons as diesel
TPPH= Total Purgeable Petroleum Hydrocarbons by EPA Method 8260B
BTEX = Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8260B
MTBE = Methyl tertiary butyl ether by EPA Method 8260B
TBA= tertiary butyl alcohol by EPA Method 8260
DIPE= di-isopropyl ether by EPA Method 8260
ETBE= ethyl tertiary butyl ether by EPA Method 8260
TAME= tertiary amyl methyl ether by EPA Method 8260
fbg = Feet below grade
µg/L = Micrograms per liter
<x = Not detected at or above laboratory detection limit
- = Not analyzed
BOLD concentrations are detected above the laboratory reporting limit for that constituent.

APPENDIX A

PREVIOUS ENVIRONMENTAL INVESTIGATION AND REMEDIATION

PREVIOUS ENVIRONMENTAL INVESTIGATION AND REMEDIATION
UNOCAL #6129
UNION OIL COMPANY OF CALIFORNIA FACILITY ID 351639
3420 35TH STREET
OAKLAND, CALIFORNIA

September 1989 Underground Storage Tank (UST) Removal
Two 10,000-gallon fuel USTs, one 550-gallon used-oil UST and associated piping were removed from the site. Kaprealian collected soil samples from the UST and used oil tank pits and from the product piping trenches. The highest hydrocarbon concentrations detected in soil included 3.3 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as diesel (TPHd), 690 mg/kg TPH as gasoline (TPHg), 3.2 mg/kg benzene, 0.36 mg/kg toluene, and 19 mg/kg total xylenes. Details are presented in Kaprealian's April 23, 1990 *Quarterly Report*.

December 1989 Well Installation
Kaprealian installed monitoring wells MW-1 through MW-3 to determine groundwater flow direction and the extent of dissolved hydrocarbons in groundwater at the site. The only hydrocarbon concentrations detected in soil included 1,200 mg/kg TPHg, 4.5 mg/kg benzene, 2 mg/kg toluene, 21 mg/kg ethylbenzene and 6.3 mg/kg total xylenes at 5 feet below grade (fbg) from MW-3. Details are presented in Kaprealian's February 5, 1990 *Preliminary Ground Water Investigation* report.

March 1990 Soil Borings
Kaprealian drilled soil borings EB-1 through EB-4 to determine the extent of hydrocarbons in soil around well MW-3. The highest hydrocarbon concentrations detected in soil included 1,100 mg/kg TPHg, 1.8 mg/kg benzene, 2.5 mg/kg toluene, 10 mg/kg ethylbenzene and 7 mg/kg total xylenes from soil that was subsequently excavated in 1991 and removed from the site. Details are presented in Kaprealian's April 23, 1990 *Continuing Subsurface Investigation* report.

April 1991 Excavation
Kaprealian excavated the soil in the vicinity of well MW-3 to a depth of approximately 6 fbg. The excavation was conducted within the boundaries of the pump island and borings EB-1 through EB-3. The soil within 3-feet of well MW-3 was not excavated. Soil samples were collected from the bottom and sides of the excavation; however, the location of only one of the bottom sampling locations was identified on the site plan. The highest hydrocarbon concentrations detected in soil included 3 mg/kg TPHg, 0.068 mg/kg ethylbenzene and 0.012 mg/kg total xylenes. Approximately 230 cubic yards of soil were excavated and removed from the site. Details are presented in Kaprealian's June 10, 1991 *Quarterly Report,* and Miller Brooks' November 23, 2003 *Limited Phase II Environmental Site Assessment Report*.

November 2003 Soil Borings
Miller Brooks Environmental, Inc. (Miller Brooks) drilled soil borings SB-1 and SB-3 through SB-5 to provide a limited evaluation of subsurface conditions at the site. The only hydrocarbon detected in soil was methyl tertiary butyl ether (MTBE) at concentrations ranging from 0.055 to 0.41 mg/kg. Details of this investigation are presented in Miller Brooks' November 23, 2003 *Limited Phase II Environmental Site Assessment Report*.

September 2006 Cone Penetrometer Testing (CPT) Borings
Delta Consultants (Delta) advanced six borings (B-2, B-4, B-7, B-8, B-10 and B-14) using CPT technology to provide a continuous record of the subsurface lithology. No soil or grab-groundwater samples were collected. Details of this investigation are presented in Delta's February 19, 2007 *Soil Boring Site Assessment Report.*

November and December 2006 Soil Borings
Delta drilled soil borings B-2, B-7 through B-10, B-12, and B-14 through B-16 to delineate the extent of petroleum hydrocarbons in soil and groundwater at the site. Borings B-2, B-7, B-8, B-10 and B-14 were drilled adjacent to the CPT borings advanced in September 2006. The highest hydrocarbon concentrations detected in soil included 220 mg/kg total purgeable petroleum hydrocarbons (TPPH), 0.46 mg/kg ethylbenzene, 0.99 mg/kg total xylenes, and 0.53 mg/kg MTBE. Grab-groundwater samples collected from the borings contained up to 4,100 micrograms per liter (µg/L) TPPH, 14 µg/L ethylbenzene, 370 µg/L total xylenes, and 2,500 µg/L MTBE. Details of this investigation are presented in Delta's February 19, 2007 *Soil Boring Site Assessment Report.*

October 2009 CPT Borings
Antea Group (Antea) advanced CPT borings B-17 through B-21 to delineate the horizontal and vertical extent of petroleum hydrocarbons. The only hydrocarbon detected in soil was MTBE at concentrations ranging from 0.0072 to 0.16 mg/kg. Antea attempted to collect grab-groundwater samples from each of the borings; however, the borings were dry. Details of this investigation are presented in Antea's April 4, 2011 *CPT Site Assessment Report.*

APPENDIX B

BORING LOGS

BORING LOG

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/12/89
Boring No. MW1	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		A.C. Pavement Clay, sand and gravel: fill; large chert boulder at 6", dark yellowish brown.
5/7/11		5	CH	Clay, high plasticity, with gravel, 5% sand, stiff, moist, dark yellowish brown.
11/15/30		10	GC/ CH	Clayey gravel, 5-10% sand, dense, moist, dark yellowish brown, lensed with gravelly clay and clay, high plasticity, very stiff, moist, dark yellowish brown, gravel to 3/4".
18/30/48		15	GC	Clayey gravel with sand, 15-35% clay, very dense, slightly moist to wet, dark yellowish brown, gravel to 1".
18/29		20		Color change at 20 feet to dark brown.

BORING LOG

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/12/89
Boring No. MW1	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
			GC	Clayey gravel with sand, as above.
16/33		25	CH	Gravelly clay, high plasticity, 10 - 15% sand, gravel to 3/4", very stiff, moist, dark yellowish brown and dark brown, mottled.
19/40		30	GC	Clayey gravel with sand, 15-30% coarse sand, very dense, moist, dark brown, gravel to 1".
26/50-5 1/2	▼	35		Clayey gravel with sand, 15-20% clay, gravel to 1 1/2", very dense, moist to wet, dark brown.
12/22		40		Clayey gravel, as above, strong brown.

BORING LOG

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/12/89
Boring No. MW1	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
			GC	Clayey gravel, as above.
		45		
		50		
		55		
		60		TOTAL DEPTH 44'

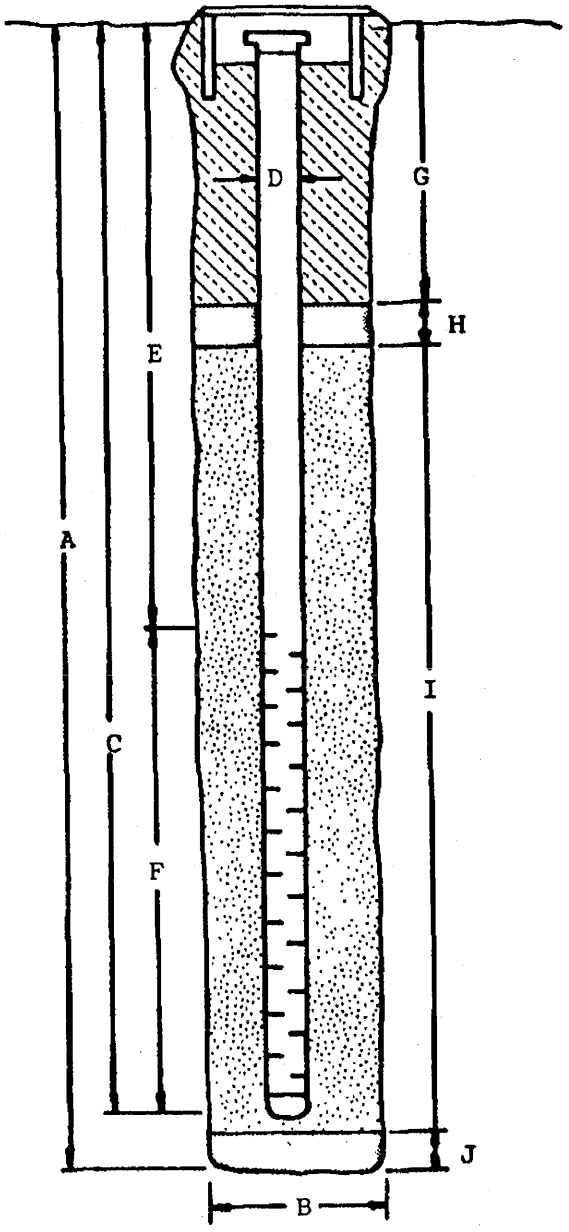
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - Oakland - 35th Avenue BORING/WELL NO. MW1

PROJECT NUMBER: KEI-P89-0902

WELL PERMIT NO.: 89689

Flush-mounted Well Cover



A. Total Depth: 44'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 44'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 24'

F. Perforated Length: 20'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 20'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 22'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

BORING LOG

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/12/89
Boring No. MW2	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0	GC	A.C. Pavement Well graded gravel with clay, 10-15% sand, very dense, moist, yellowish brown to dark yellowish brown, gravel to 5", sand content decreases with depth.
10/15/16		5		Clayey gravel, 25-45% clay, 10-15% sand, very dense, very moist, dark yellowish brown, gravel to 1".
13/36/ 50-5"				
29/39/40		10	GC/ CH	Clayey gravel, as above, lensed with gravelly clay, same.
27/38/ 50-5"			GC	Color change at 12 feet, dark yellowish brown and strong brown, mottled.
				Color change at 14 feet to dark yellowish brown.
37/50- 5 1/2		15		
27/37/47				Clayey gravel with sand, very dense, slightly moist to moist, dark yellowish brown, gravel to 1 1/2".
16/30/39		20		Clayey gravel, very dense, moist, dark brown.

BORING LOG

Project No.	Boring & Casing Diameter	Logged By
KEI-P89-0902	9" 2"	D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/12/89
Boring No. MW2	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
30/50			GC	Clayey gravel to gravelly clay, very dense, moist, dark brown, clay is high plasticity, very stiff.
25/34/50-6"		25	GW-GC	Well graded gravel with clay and sand, 25-35% coarse sand, very dense, moist, dark brown.
15/20/33			CH	Sandy clay, high plasticity, 5-10% sand, very stiff, moist, dark brown to dark reddish brown.
16/22/35		30	GC	Clayey gravel with sand, gravel to 1", 15-30% sand, very dense, moist, dark brown.
13/24/48				
27/37/40			GW-GC	Well graded gravel with clay and sand, gravel to 2".
40/25/34	▼	35		
19/22/32		40	CH	Sandy clay, high plasticity, with gravel, very stiff, moist, dark brown 15-30% gravel to 5/8".

BORING LOG

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 12/12/89
Boring No. MW2	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
17/24/25		45 50 55 60	CH	Sandy clay as above. Gravelly clay, high plasticity, with sand, very stiff, moist, dark brown, gravel to 5/8".
				TOTAL DEPTH 44'

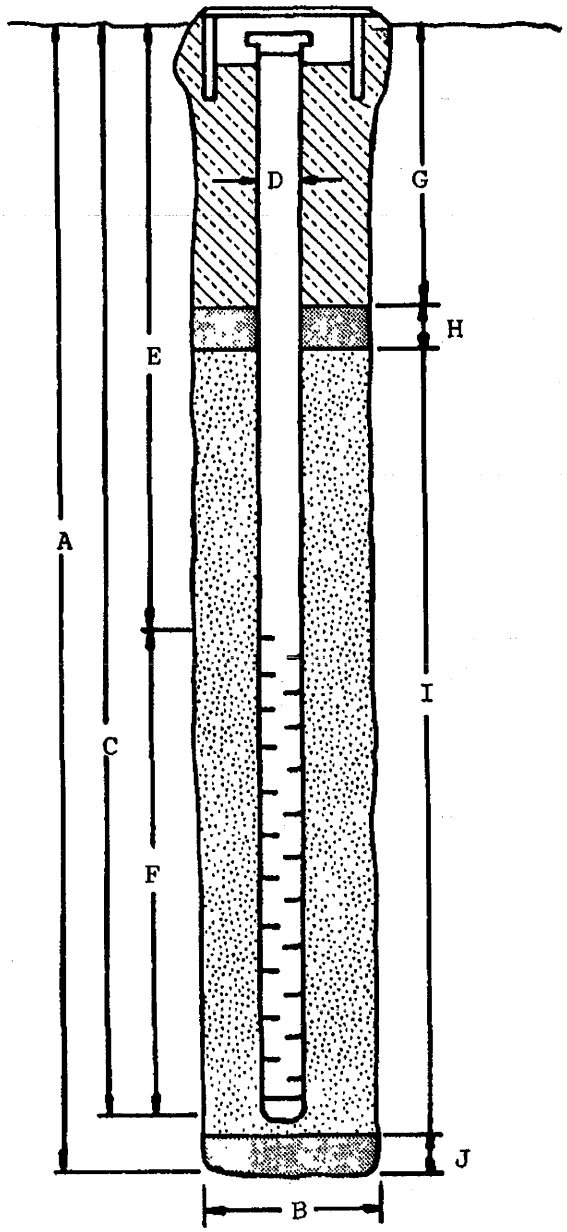
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - Oakland - 35th Avenue BORING/WELL NO.: MW2

PROJECT NUMBER: KEI-P89-0902

WELL PERMIT NO.: 89689

Flush-mounted Well Cover



A. Total Depth: 44'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 44'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375" ID = 2.067"

E. Depth to Perforations: 24'

F. Perforated Length: 20'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 20'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 22'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

BORING LOG

Project No. KEI-P89-0902	**Boring & Casing Diameter** 9" 2"	**Logged By** D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/13/89
Boring No. MW3	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		A.C. Pavement Gravel, sand and clay: fill and disturbed native soil, dark yellowish brown.
11/12 8/21/36		5	GC	No sample recovery first attempt. Clayey gravel with sand, very dense, very moist to wet, olive, dark yellowish brown below 6 feet.
13/29		10		Clayey gravel with sand, 25-35% clay, gravel to 1 1/2", very dense, moist, dark yellowish brown, clay is high plasticity.
16/30/ 50-5 1/2		15	CH	Gravelly clay, high plasticity, with sand, very stiff to hard, moist, dark brown and dark yellowish brown, mottled.
26/34		20	GC	Clayey gravel with sand, lensed with with clay sand with gravel to 3/8", very dense, moist, dark brown, 15% clay throughout, gravel to 1".

BORING LOG

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 12/13/89
Boring No. MW3	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
19/33		25	GC	Clayey gravel with sand, 15-25% sand, very dense, moist, dark brown.
8/8/12		30	CH	Sandy clay, high plasticity, firm to stiff, moist, strong brown. Gravelly clay, high plasticity with sand, dense, moist to very moist, strong brown to dark brown.
40/50/50		35	GW-GC	Well graded gravel with clay and sand, very dense, moist to wet, dark brown, gravel to >2".
43/50-5"	▼			
		40	GC/CH	Undifferentiated clayey gravel and gravelly clay, very dense, very stiff, dark brown.

BORING LOG

Project No.	Boring & Casing Diameter	Logged By
KEI-P89-0902	9" 2"	D.L.
Project Name Unocal Oakland - 35th Ave.	**Well Head Elevation** N/A	**Date Drilled** 12/13/89
Boring No. MW3	**Drilling Method** Hollow-stem Auger	**Drilling Company** EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
			GC/ CH	Undifferentiated clayey gravel and gravelly clay, as above.
		45		
		50		
		55		
		60		TOTAL DEPTH 44'

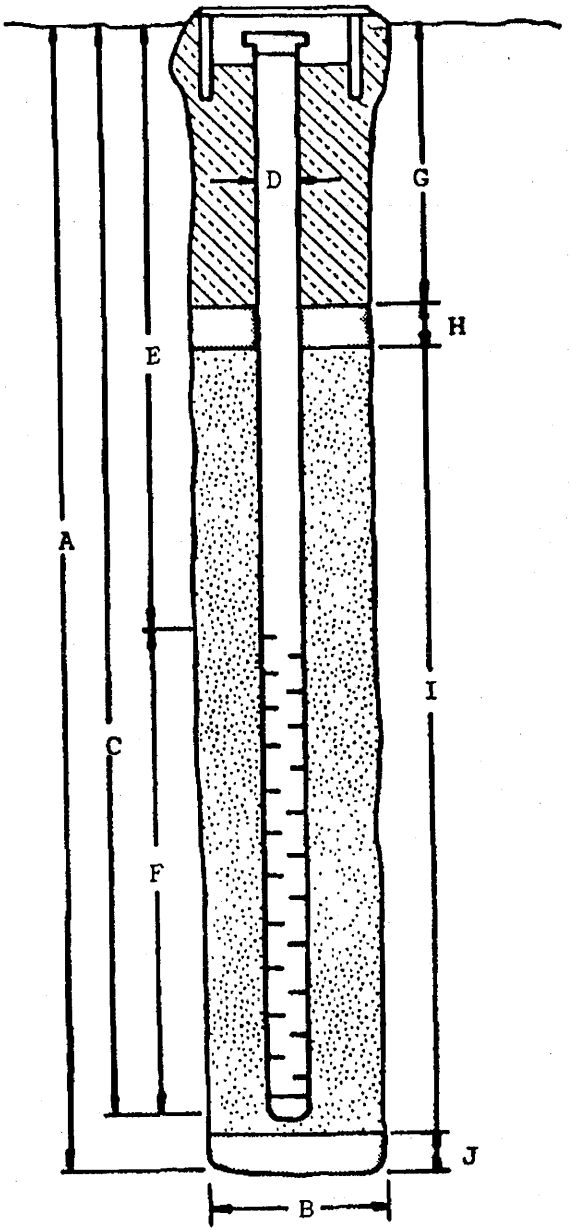
WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - Oakland - 35th Avenue BORING/WELL NO. MW3

PROJECT NUMBER: KEI-P89-0902

WELL PERMIT NO.: 89689

Flush-mounted Well Cover



A. Total Depth: 44'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 43'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 23'

F. Perforated Length: 20'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 19'

Seal Material: Concrete

H. Seal: 2'

Seal Material: Bentonite

I. Gravel Pack: 22'

Pack Material: RMC Lonestar Sand

Size: #3

J. Bottom Seal: None

Seal Material: N/A

*Boring diameter can vary from 8-1/4" to 9" depending on bit wear.

BORING LOG

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 3-14-90
Boring No. EB1	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		Concrete Pavement Clay, sand and gravel: imported fill and disturbed native material, gravel to 4" diameter, dark yellowish brown, dark olive gray below 2 feet.
8/14/10		5	CL/ CH	Clay, with sand, trace silt, stiff, moist, olive brown.
8/27/28		10	GC	Clayey gravel with sand, gravel to >2" diameter, very dense, moist, dark yellowish brown.
		15		
		20		TOTAL DEPTH DRILLED: 9' TOTAL DEPTH SAMPLED: 10.5'

BORING LOG

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 3-14-90
Boring No. EB2	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		Concrete Pavement Sand: fill.
				Clay, sand and gravel: imported fill and disturbed native material, olive brown and olive gray.
14/12/7		5		Very poor recovery Fill: clay, sand and gravel, olive, wet (perched water?).
7/20/26 16/19/25		10	GC	Clayey gravel with sand, gravel to 1" diameter, dense, moist, dark yellowish brown.
		15		
		20		TOTAL DEPTH DRILLED: 9.5' TOTAL DEPTH SAMPLED: 11'

BORING LOG

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 3-14-90
Boring No. EB3	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		A. C. Pavement
				Clay, sand, and gravel: imported fill and disturbed native material, dark yellowish brown grading to olive brown.
7/10/19		5		Poor sample recovery at 5 feet. Perched water, discoloration.
				Approximate base of fill.
			GC	Clayey gravel with sand, gravel to 1" diameter, very dense, moist, dark yellowish brown.
17/26/23		10		
		15		
		20		

TOTAL DEPTH DRILLED: 9'
TOTAL DEPTH SAMPLED: 10.5'

BORING LOG

Project No. KEI-P89-0902	Boring & Casing Diameter 9" 2"	Logged By D.L.
Project Name Unocal Oakland - 35th Ave.	Well Head Elevation N/A	Date Drilled 3-14-90
Boring No. EB4	Drilling Method Hollow-stem Auger	Drilling Company EGI

Penetration blows/6"	G. W. level	Depth (ft) Samples	Stratigraphy USCS	Description
		0		A. C. Pavement Clay, sand and gravel: fill and disturbed native material, dark yellowish brown.
9/14/22		5	GC	Clayey gravel with sand, gravel to >2" diameter, very dense, moist, dark yellowish brown.
12/28/30		10		
		15		
		20		TOTAL DEPTH DRILLED: 9' TOTAL DEPTH SAMPLED: 10.5'

PROJECT NAME	SITE LOCATION:		
CONOCO PHILLIPS #6129	3420 35TH AVENUE, OAKLAND, CALIFORNIA		
DRILLING COMPANY: CASCADE	DRILL RIG: CME-75	DRILL CREW: KIKI, JASON, JUSTIN	DATE DRILLED: NOVEMBER 12, 2003
DRILLING METHOD: HOLLOW-STEM AUGER	BORING DIAMETER (IN): 8	TOTAL DEPTH OF BORING (FT): 36.5	LOGGED BY: J. SMITH
SAMPLING METHOD: SPLIT-SPOON	HAMMER WEIGHT (LBS): 140	HAMMER DROP (IN): 30	REVIEWED BY: S. DEFIBAUGH, R.G. 5626

DEPTH (FT)	SAMPLE LOCATION	SAMPLE ID	BLOWS PER 6 IN	PID (ppm)	GRAPHIC LOG	USCS SOIL GROUP	DESCRIPTION OF SUBSURFACE MATERIALS
0							Asphalt surface; hand-augered to 5 feet below ground surface. FILL: cobble.
5			7/8/8	0.0		CL	LEAN CLAY: dark yellowish brown (10YR 4/6); low plasticity; high dry strength; no dilatancy; high toughness; few coarse-grained sand; few fine gravel; moist; firm.
10			7/7/8	0.0			LEAN CLAY with GRAVEL: little fine gravel.
15			3/8/8	0.0		ML	SILT with SAND: strong brown (7.5YR 4/6); no plasticity; high dry strength; no dilatancy; medium toughness; little fine gravel; moist; firm.
20			8/8/9	0.0		SM	SILTY SAND: strong brown (7.5YR 4/6); few fine gravel; moist; medium dense.
25			7/8/9	0.0		GM	SILTY GRAVEL with SAND: strong brown (7.5YR 4/6); fine gravel, subrounded; little silt; moist; medium dense.
30		SB-1-31	7/8/9	0.0		CL	LEAN CLAY: strong brown (7.5YR 4/6); medium plasticity; high dry strength; no dilatancy; high toughness; few coarse-grained sand; moist; firm.
35			10/11/11	0.0			Some fine-grained sand; few fine gravel; wet.
40							Boring terminated at 36.5 feet below ground surface. Groundwater observed at 35 feet below ground surface.

NOTES:
▯▯ = sample interval
▬ = laboratory sample
▼ = groundwater observed
PID = photoionization detector
NM = not measured
NA = not applicable
ppm = parts per million

REGISTERED GEOLOGIST
JED A. DOUGLAS
NO. 7516
STATE OF CALIFORNIA

JED A. DOUGLAS, R.G. 7516

MILLER BROOKS Environmental, Inc.

LOG OF BORING SB-1

PROJECT NUMBER 06-459-6129-01

PAGE 1 OF 1

LOG_OF_BORING_LBY BOREL.BL.GPJ MBE.GDT 11/25/03

PROJECT NAME:		SITE LOCATION:		
CONOCO PHILLIPS #8129		3420 35TH AVENUE, OAKLAND, CALIFORNIA		
DRILLING COMPANY:	DRILL RIG:	DRILL CREW:		DATE DRILLED:
CASCADE	CME-75	KIKI, JASON, JUSTIN		NOVEMBER 12, 2003
DRILLING METHOD:	BORING DIAMETER (IN):	TOTAL DEPTH OF BORING (FT):		LOGGED BY:
HOLLOW-STEM AUGER	8	31.5		J. SMITH
SAMPLING METHOD:	HAMMER WEIGHT (LBS):	HAMMER DROP (IN)		REVIEWED BY:
SPLIT-SPOON	140	30		S. DEFIBAUGH, R.G. 5826

DEPTH (FT)	SAMPLE LOCATION	SAMPLE ID	BLOWS PER 6 IN	PID (ppm)	GRAPHIC LOG	USCS SOIL GROUP	DESCRIPTION OF SUBSURFACE MATERIALS
0							Asphalt surface; hand-augered to 5 feet below ground surface. FILL: cobble.
5			8/8/9	0.0		CL	GRAVELLY LEAN CLAY: dark yellowish brown (10YR 4/4); medium plasticity; high dry strength; no dilatancy; medium toughness; few medium-grained sand; moist; firm.
10			7/8/8	0.0			High toughness.
15			6/7/8	0.0		SC	CLAYEY SAND with GRAVEL: yellowish brown (10YR 5/8); little fine gravel; moist; medium dense.
20			7/8/8	0.0			Brown (7.5YR 4/4); few fine gravel.
25		SB-3-26	8/8/9	0.0			Some fine gravel, subrounded.
30			7/7/7	0.0			Moist to very moist.
35							Boring terminated at 31.5 feet below ground surface. Groundwater not observed.
40							

REGISTERED GEOLOGIST
JED A. DOUGLAS
NO. 7516
STATE OF CALIFORNIA

NOTES:
- ☐ = sample interval
- ■ = laboratory sample
- ▼ = groundwater observed
- PID = photoionization detector
- NM = not measured
- NA = not applicable
- ppm = parts per million

MILLER BROOKS Environmental, Inc.

JED A. DOUGLAS, R.G. 7516

LOG OF BORING SB-3

PROJECT NUMBER 06-459-6129-01 | PAGE 1 OF 1

LOG_OF_BORING_LBY BORELBL.GPJ MBE.GDT 11/25/03

PROJECT NAME:	SITE LOCATION:		
CONOCO PHILLIPS #6129	3420 35TH AVENUE, OAKLAND, CALIFORNIA		
DRILLING COMPANY:	DRILL RIG:	DRILL CREW:	DATE DRILLED:
CASCADE	CME-75	KIKI, JASON, JUSTIN	NOVEMBER 13, 2003
DRILLING METHOD:	BORING DIAMETER (IN):	TOTAL DEPTH OF BORING (FT):	LOGGED BY:
HOLLOW-STEM AUGER	8	31.0	J. SMITH
SAMPLING METHOD:	HAMMER WEIGHT (LBS):	HAMMER DROP (IN):	REVIEWED BY:
SPLIT-SPOON	140	30	S. DEFIBAUGH, R.G. 5626

DEPTH (FT)	SAMPLE LOCATION	SAMPLE ID	BLOWS PER 6 IN	PID (ppm)	GRAPHIC LOG	USCS SOIL GROUP	DESCRIPTION OF SUBSURFACE MATERIALS
0							Concrete surface; hand-augered to 5 feet below ground surface. FILL: cobble.
5			8/8/8	0.0		SC	CLAYEY SAND with GRAVEL: dark yellowish brown (10YR 4/4); little fine gravel, subrounded; moist; medium dense.
10			7/7/8	0.0		CL	SANDY LEAN CLAY: dark yellowish brown (10YR 4/4); low plasticity; high dry strength; no dilatancy; high toughness; few fine gravel; moist; firm.
15			7/8/9	0.0		GC	CLAYEY GRAVEL with SAND: yellowish brown (10YR 5/6); some gravel, subrounded; moist; medium dense.
20			8/8/8	0.0			Strong brown (7.5YR 4/6).
25		SB-4-26	7/9/9	0.0		CL	GRAVELLY LEAN CLAY with SAND: strong brown (7.5YR 4/6); low plasticity; high dry strength; no dilatancy; high toughness; moist; firm.
30			9/9/9	0.0		SC	CLAYEY SAND with GRAVEL: strong brown (7.5YR 4/6); few fine gravel; moist to very moist; medium dense.
35							Boring terminated at 31 feet below ground surface. Groundwater not observed.
40							

REGISTERED GEOLOGIST
JED A. DOUGLAS
NO. 7516
STATE OF CALIFORNIA

NOTES:
- ☐ = sample interval
- ▬ = laboratory sample
- ▼ = groundwater observed
- PID = photoionization detector
- NM = not measured
- NA = not applicable
- ppm = parts per million

JED A DOUGLAS, R.G. 7516

MILLER BROOKS Environmental, Inc.

LOG OF BORING SB-4

PROJECT NUMBER 06-459-6129-01

PAGE 1 OF 1

LOG OF BORING_LBY BOREIBL.GPJ MBE.GDT 11/25/03

PROJECT NAME.	SITE LOCATION.		
CONOCO PHILLIPS #6129	3420 35TH AVENUE, OAKLAND, CALIFORNIA		
DRILLING COMPANY: CASCADE	DRILL RIG: CME-75	DRILL CREW: KIKI, JASON, JUSTIN	DATE DRILLED: NOVEMBER 13, 2003
DRILLING METHOD: HOLLOW-STEM AUGER	BORING DIAMETER (IN): 8	TOTAL DEPTH OF BORING (FT): 31.5	LOGGED BY: J. SMITH
SAMPLING METHOD: SPLIT-SPOON	HAMMER WEIGHT (LBS): 140	HAMMER DROP (IN): 30	REVIEWED BY: S. DEFIBAUGH, R.G. 5626

DEPTH (FT)	SAMPLE LOCATION	SAMPLE ID	BLOWS PER 6 IN	PID (ppm)	GRAPHIC LOG	USCS SOIL GROUP	DESCRIPTION OF SUBSURFACE MATERIALS
0							Asphalt surface; hand-augered to 5 feet below ground surface. FILL: cobble.
5			7/7/8	0.0		CL	GRAVELLY LEAN CLAY: dark yellowish brown (10YR 4/4); high plasticity; high dry strength; no dilatancy; medium toughness; moist; firm.
10			6/6/7	0.0			Medium plasticity; high toughness.
15			7/7/9	0.0		SC	CLAYEY SAND with GRAVEL: dark yellowish brown (10YR 4/6); few fine gravel; moist; medium dense.
20			9/11/11	0.0			
25			10/10/10	0.0		CL	GRAVELLY LEAN CLAY: dark yellowish brown (10YR 4/4); low plasticity; high dry strength; no dilatancy; high toughness; few fine- to coarse-grained sand; moist; firm.
30		SB-5-31	9/10/10	0.0			Boring terminated at 31 feet below ground surface. Groundwater not observed.
35							
40							

REGISTERED GEOLOGIST
JED A. DOUGLAS
NO. 7516
STATE OF CALIFORNIA

NOTES:
▽ = groundwater observed
PID = photoionization detector
NM = not measured
NA = not applicable
ppm = parts per million
= sample interval
= laboratory sample

JED A. DOUGLAS, R.G. 7516

MILLER BROOKS Environmental, Inc.

LOG OF BORING SB-5

PROJECT NUMBER 06-459-6129-01 | PAGE 1 OF 1

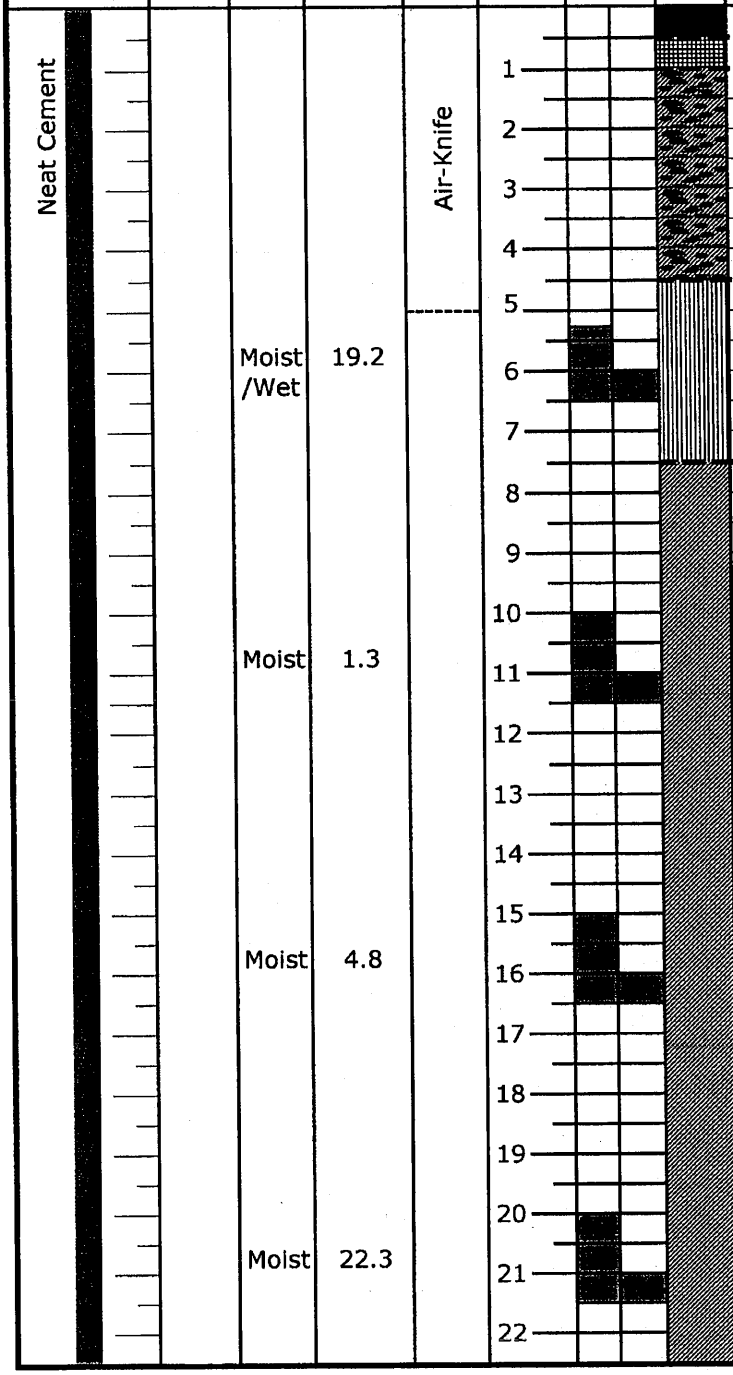
LOG OF BORING LBY BORELBL.GPJ MBE.GDT 11/25/03

Delta
Consultants

Project No: **C106129051** | Client: **ConocoPhillips** | Boring/Well No: **B-2**
Logged By: **Ben Wright** | Location: **3420 35th Avenue** | Date Drilled: **11/7/06**
Driller: **Gregg Drilling & Testing** | **Oakland, CA** | Page **1** of **2**
Drilling Method: **HSA/Rhino** | Hole Diameter: **6.25" O.D.**
Sampling Method: **Auto Hammer** | Hole Depth: **40'**
Casing Type: **Temporary 3/4" PVC** | Well Diameter: NA
Slot Size: **0.02"** | Well Depth: NA
Gravel Pack: NA | Static Groundwater Depth: **36.5'**

▼ = Static Groundwater

Elevation | Northing | Easting



	LITHOLOGY / DESCRIPTION
	Asphalt - 3"
	Road Base - 4"
GC	**Clayey gravel with sand** reddish brown; well graded; angular; fine to coarse sand; gravel composed of metasediments; some cobbles and boulders (70,15,15)
ML	**Silt** greenish blackish brown; low plasticity; soft; moist to wet; odor (0,10,90)
CL	**Clay with sand** orangish brown; medium plasticity; very stiff; medium to coarse sand; moist; no odor (0,20,80)
CL	Same as above; less sand; medium soft (0,15,85)
CL	**Clay** brown; medium plasticity; very stiff; moist; odor (0,0,100)

Delta
Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **Auto Hammer**
Casing Type: **Temporary 3/4" PVC**
Slot Size: **0.02"**
Gravel Pack: NA

Client: **ConocoPhillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **6.25" O.D.**
Hole Depth: **40'**
Well Diameter: NA
Well Depth: NA
Static Groundwater Depth: **36.5'**

Boring/Well No: **B-2**
Date Drilled: **11/7/06**
Page **2** of **2**

▼ = Static Groundwater

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement					23				
					24				
					25				
		Moist	888		26				**ML** **Silt with sand** orangish brown; low plasticity; medium stiff, medium to coarse sand; moist; strong odor (0,20,80)
					27				
					28				
					29				
					30				
		Moist	19.2		31				**CL** **Clay** orangish brown; medium plasticity; soft; moist; odor (0,0,100)
					32				
					33				
					34				
					35				
	▼	Wet	5.6		36				**CL** **Clay with sand** orangish brown; medium plasticity; medium soft to soft; wet; no odor (0,15,85)
					37				
					38				
					39				
		Wet	3.5		40				**CL** Same as above
					41				Total Depth = 40 feet bgs
					42				
					43				
					44				

Delta
Consultants

Project No: **C106129051** | Client: **ConocoPhillips**
Logged By: **Ben Wright** | Location: **3420 35th Avenue**
Driller: **Gregg Drilling & Testing** | **Oakland, CA**
Drilling Method: **HSA/Rhino** | Hole Diameter: **5.5" O.D.**
Sampling Method: **Auto Hammer** | Hole Depth: **31.5'**
Casing Type: **Temporary 3/4" PVC** | Well Diameter: NA
Slot Size: **0.02"** | Well Depth: NA
Gravel Pack: NA | Static Groundwater Depth: **31'**

Boring/Well No: **B-7**
Date Drilled: **11/8/06**
Page **1** of **2**

▼ = Static Groundwater

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement				Air-Knife	1				**Concrete** = 5"
					2				**GC** **Clayey gravel with sand** reddish brown; well graded; fine to coarse sand; moist; no odor (70,15,15)
					3				
					4				
					5				
		Wet	1.0		6				**CL** **Clay** greenish grayish brown; medium plasticity; medium soft; some sand and silt; wet; no odor (0,10,90)
					7				
					8				
					9				
					10				
		Moist	5.5		11				**CL** **Clay** orangish brown; medium plasticity; stiff; moist; no odor (0,0,100)
					12				
					13				
					14				
					15				
		Damp	19.7		16				**CL** Same as above; damp
					17				
					18				
					19				
					20				
		Damp	23.7		21				**CL** Same as above
					22				

Delta
Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **Auto Hammer**
Casing Type: **Temporary 3/4" PVC**
Slot Size: **0.02"**
Gravel Pack: NA

Client: **ConocoPhillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **5.5" O.D.**
Hole Depth: **31.5'**
Well Diameter: NA
Well Depth: NA
Static Groundwater Depth: **31'**

Boring/Well No: **B-7**
Date Drilled: **11/8/06**
Page **2** of **2**

▼ = Static Groundwater

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement		Moist	13.1		25–26				CL **Clay with sand** orangish brown; medium plasticity; medium soft; medium to coarse sand; moist, no odor (0,15,85)
	▼	Sat	1.8		30–31				CL **Clay** orangish brown, medium plasticity; medium soft; saturated; no odor (0,0,100)
									Total Depth = 31.5 feet bgs

Delta Consultants

Project No: **C106129051** | Client: **Conocophillips**
Logged By: **Ben Wright** | Location: **3420 35th Avenue**
Driller: **Gregg Drilling & Testing** | **Oakland, CA**
Drilling Method: **HSA/Rhino** | Hole Diameter: **5.5" O.D.**
Sampling Method: **Auto Hammer** | Hole Depth: **40'**
Casing Type: **Temporary 3/4" PVC** | Well Diameter: NA
Slot Size: **0.02"** | Well Depth: NA
Gravel Pack: NA | Static Groundwater Depth: **37'**

Boring/Well No: **B-8**
Date Drilled: **11/7/06**
Page **1** of **2**

▽ = First Water
▼ = Static Groundwater

Elevation	Northing	Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement				Air-Knife				**Asphalt** - 3"
					1–3			GC **Clayey gravel with sand** reddish brown; well graded; angular; fine to coarse sand; gravel composed of metasediments; some cobbles and boulders (70,15,15)
					4			
		Moist	1.8		5–6			CL **Clay with sand** orangish brown; medium plasticity; stiff; moist; no odor (0,15,85)
					7–9			
		Moist	0.5		10–11			CL **Clay** orangish brown; medium plasticity; very stiff; moist; no odor (0,0,100)
					12–14			
		Moist	0.7		15–16			CL Same as above; some sand (0,10,90)
					17–19			
		Moist	0.7		20–21			CL Same as above
					22			

Delta
Consultants

Project No: **C106129051** | Client: **Conocophillips** | Boring/Well No: **B-8**
Logged By: **Ben Wright** | Location: **3420 35th Avenue** | Date Drilled: **11/7/06**
Driller: **Gregg Drilling & Testing** | **Oakland, CA** | Page **2** of **2**
Drilling Method: **HSA/Rhino** | Hole Diameter: **5.5" O.D.**
Sampling Method: **Auto Hammer** | Hole Depth: **40'**
Casing Type: **Temporary 3/4" PVC** | Well Diameter: NA
Slot Size: **0.02"** | Well Depth: NA
Gravel Pack: NA | Static Groundwater Depth: **37'**

▽ = First Water
▼ = Static Groundwater

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery / Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement		Moist	0.9		25–26			**CL** Same as above; stiff
		Moist	5		30–31			**CL** Same as above; some silt; medium soft (0,10,90)
	▽ ▼	Sat	3.3		35–36			**ML** **Silt** orangish yellowish brown; low plasticity; medium soft; to soft; saturated; no odor (0,0,100)
		Sat	2		39–40			**CL** **Clay** orangish yellowish brown; medium plasticity; medium soft; some gravel; saturated; no odor (10,10,80)
								Total Depth = 40 feet bgs

Delta
Consultants

Project No: **C106129051** | Client: **Conocophillips** | Boring/Well No: **B-9**
Logged By: **Ben Wright** | Location: **3420 35th Avenue** | Date Drilled: **11/8/06**
Driller: **Gregg Drilling & Testing** | **Oakland, CA** | Page **1** of **1**
Drilling Method: **HSA/Rhino** | Hole Diameter: **5.5" O.D.**
Sampling Method: **Auto Hammer** | Hole Depth: **21.5'**
Casing Type: **Temporary 3/4" PVC** | Well Diameter: NA
Slot Size: **0.02"** | Well Depth: NA
Gravel Pack: NA | Static Groundwater Depth: **16'**
Elevation | Northing | Easting

▼ = Static Groundwater

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery / Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement								**Concrete** = 5"
		Moist		Air-Knife	1–4			CL **Clay** orangish brown, medium plasticity; medium stiff; some silt, moist; no odor (0,0,100)
		Wet	0.2		5–9			GC **Clayey gravel** grayish brown; poorly graded; one-inch gravel; subangular; some sand, silt, and clay; possible fill material; wet; no odor (70,10,20)
		Sat	0.4		10–13			ML **Silt with sand** greenish grayish brown; low to medium plasticity; some clay; stiff to medium stiff; saturated; no odor (10,10,80)
	▼	Sat	0.4		14–16			CL **Clay** orangish brown, medium plasticity; stiff; saturated; no odor (0,0,100)
		Sat	0.2		17–21			CL Same as above; medium soft
					22			Total Depth = 21.5 feet bgs

Delta
Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **SSS**
Casing Type: NA
Slot Size: NA
Gravel Pack: NA

Client: **ConocoPhillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **5.25"**
Hole Depth: **36.5'**
Well Diameter: NA
Well Depth: NA
First Water Depth: **35.0'**

Boring/Well No: **B-10**
Date Drilled: **12/27/06**
Page **1** of **2**

▽ = First Water

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement									**Asphalt** - 3"
		Moist		Air-Knife	1–4				**GC** **Clayey gravel with sand** reddish brown; well graded; fine to coarse sand; moist; no odor (70,15,15)
		Moist	0.4	B-10 @5.5' 9:45	5–8				**CL** **Clay** orangish brown; medium to low plasticity; soft; moist; no odor (10,0,90)
		Moist	0.2	B-10 @10.5' 9:50	9–13				**GC** **Clayey gravel** yellowish brown; well graded; fine to coarse gravel; subangular; moist; no odor (60,10,30)
		Moist	1.0	B-10 @15.5' 9:55	14–17				**CL** **Clay with sand** orangish brown; medium plasticity; some gravel; stiff; moist; no odor (10,20,70)
		Moist	0.5	B-10 @20.5' 10:00	18–22				**CL** Same as above

Delta
Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **SSS**
Casing Type: NA
Slot Size: NA
Gravel Pack: NA

Client: **ConocoPhillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **5.25"**
Hole Depth: **36.5'**
Well Diameter: NA
Well Depth: NA
First Water Depth: **35.0'**

Boring/Well No: **B-10**
Date Drilled: **12/27/06**
Page **2** of **2**

▽ = First Water

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement		Moist	1.3	B-10 @25.5' 10:05	25–26				CL **Sandy Clay** orangish brown; medium plasticity; fine to coarse sand; moist; no odor (10,25,65)
		Moist	3.2	B-10 @30.5' 10:10	30–31				CL **Clay** orangish brown; medium plasticity; medium soft; moist; no odor (0,10,90)
	▽	Sat	4.1	B-10 @35.5' 10:15	35–36				CL **Sandy clay** orangish brown; medium plasticity; medium soft; saturated; no odor (0,30,70)
					37				Total Depth = 36.5 feet bgs

Delta Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **SSS**
Casing Type: NA
Slot Size: NA
Gravel Pack: NA

Client: **ConocoPhillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **5.25"**
Hole Depth: **36.5'**
Well Diameter: NA
Well Depth: NA
First Water Depth: **32.0'**

Boring/Well No: **B-12**
Date Drilled: **12/27/06**

▽ = First Water

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery / Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement								**Asphalt** - 3"
		Moist		Air-Knife	1–3		GC	**Clayey gravel with sand** reddish brown; well graded; fine to coarse sand; angular to subrounded gravel; moist; no odor (70,15,15)
		Moist	2.4	B-12 @5.5' 1:10	5–6		CL	**Clay** orangish brown; medium plasticity; soft; moist; no odor (0,0,100)
		Moist	2.3	B-12 @10.5' 1:15	10–11		CL	**Clay** reddish brown; medium plasticity; medium soft to stiff; moist; no odor (10,10,80)
		Moist	1.2	B-12 @15.5' 1:25	15–16		CL	**Sandy Clay** orangish brown; medium plasticity; fine to coarse sand; moist; no odor (0,20,80)
		Moist	0.3	B-12 @20.5' 1:28	20–21		CL	Same as above

Delta
Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **SSS**
Casing Type: NA
Slot Size: NA
Gravel Pack: NA

Client: **ConocoPhillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **5.25"**
Hole Depth: **36.5'**
Well Diameter: NA
Well Depth: NA
First Water Depth: **32.0'**

Boring/Well No: **B-12**
Date Drilled: **12/27/06**
Page **2** of **2**

▽ = First Water

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement					23				
					24				
					25				
		Moist	1.3	B-12 @25.5' 1:30	26				**CL** Same as above
					27				
					28				
					29				
					30				
		Moist	1.2	B-12 @30.5' 1:35	31				**CL** Same as above
	▽				32				
					33				
					34				
					35				
		Sat	0.9	B-12 @35.5' 1:40	36				**CL** Same as above; saturated
					37				Total Depth = 36.5 feet bgs
					38				
					39				
					40				
					41				
					42				
					43				
					44				

Delta
Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **Auto Hammer**
Casing Type: **Temporary 3/4" PVC**
Slot Size: **0.02"**
Gravel Pack: NA

Client: **Conocophillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **5.5" O.D.**
Hole Depth: **31.5'**
Well Diameter: NA
Well Depth: NA
Static Groundwater Depth: **29'**

Boring/Well No: **B-14**
Date Drilled: **11/8/06**

▼ = Static Groundwater

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement				Air-Knife	1				**Asphalt** - 3"
					2				GC **Clayey gravel with sand** reddish brown; well graded; angular; fine to coarse sand; gravel composed of metasediments; some cobbles and boulders (70,15,15)
					3				
					4				
					5				
		Moist	0.0		6				CL **Clay** orangish brown; medium to low plasticity; soft; moist; no odor (0,0,100)
					7				
					8				
					9				
					10				
		Moist	0.0		11				GC **Clayey gravel** yellowish orangish brown; well graded; fine to coarse gravel; subangular; moist; no odor (60,10,30)
					12				
					13				
					14				
					15				
		Moist	0.0		16				CL **Clay with sand** orangish brown; medium plasticity; some gravel; stiff; moist; no odor (10,10,80)
					17				
					18				
					19				
					20				
		Moist	0.0		21				CL Same as above
					22				

Delta
Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **Auto Hammer**
Casing Type: **Temporary 3/4" PVC**
Slot Size: **0.02"**
Gravel Pack: NA

Client: **Conocophillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **5.5" O.D.**
Hole Depth: **31.5'**
Well Diameter: NA
Well Depth: NA
Static Groundwater Depth: **29'**

Boring/Well No: **B-14**
Date Drilled: **11/8/06**
Page **2** of **2**

▼ = Static Groundwater

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement	▼	Moist	0.1		25–26				CL **Sandy clay** orangish brown; medium plasticity; some gravel; stiff; moist; no odor (10,25,65)
		Sat	0.0		30–31				CL Same as above
									Total Depth = 31.5 feet bgs

Delta
Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **SSS**
Casing Type: NA
Slot Size: NA
Gravel Pack: NA

Client: **ConocoPhillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **5.25"**
Hole Depth: **36.5'**
Well Diameter: NA
Well Depth: NA
First Water Depth: **32.0'**

Boring/Well No: **B-15**
Date Drilled: **12/27/06**

▽ = First Water

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement									**Asphalt** - 3"
		Moist		Air-Knife	1–3				CL **Clayey gravel with sand** reddish brown; well graded; fine to coarse sand; angular to subrounded gravel; moist; no odor (70,15,15)
		Moist	0.2	B-15 @5.5' 2:35	5–6				CL **Clay** orangish brown; medium plasticity; stiff; moist; no odor (0,0,100)
		Moist	0.0	B-15 @10.5' 2:40	10–11				CL **Clay** reddish brown; medium plasticity; medium stiff; moist; no odor (10,10,80)
		Moist	0.0	B-15 @15.5' 2:45	15–16				CL **Sandy clay** orangish brown; medium plasticity; fine to coares sand; moist; no odor (0,20,80)
		Moist	0.2	B-15 @20.5' 2:50	20–21				CL Same as above

Delta
Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **SSS**
Casing Type: NA
Slot Size: NA
Gravel Pack: NA

Client: **ConocoPhillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **5.25"**
Hole Depth: **36.5'**
Well Diameter: NA
Well Depth: NA
First Water Depth: **32.0'**

Boring/Well No: **B-15**
Date Drilled: **12/27/06**

▽ = First Water

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement		Moist	0.0	B-15 @25.5' 3:00	25–26				**CL** Same as above
	▽	Moist	0.0	B-15 @30.5' 3:05	30–31				**CL** Same as above
		Sat	0.0	B-15 @35.5' 3:10	35–36				**CL** Same as above; saturated
					36				Total Depth = 36.5 feet bgs

Delta
Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **SSS**
Casing Type: NA
Slot Size: NA
Gravel Pack: NA

Client: **ConocoPhillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **5.25"**
Hole Depth: **36.5'**
Well Diameter: NA
Well Depth: NA
First Water Depth: **30.0'**

Boring/Well No: **B-16**
Date Drilled: **12/27/06**

▽ = First Water

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement									**Asphalt** - 3"
		Moist		Air-Knife	1–3				GC **Clayey gravel with sand** reddish brown; well graded; fine to coarse sand; moist; no odor (70,15,15)
		Moist	0.0	B-16 @5.5' 11:05	5–6				CL **Clay** orangish brown; medium plasticity; medium soft; moist; no odor (10,10,80)
		Moist	0.6	B-16 @10.5' 11:10	10–11				CL **Clay** brown; medium plasticity; moist; no odor (0,0,100)
		Moist	1.0	B-16 @15.5' 11:15	15–16				CL **Clay with gravel** orangish brown; medium plasticity; moist; no odor (20,10,70)
		Moist	1.4	B-16 @20.5' 11:20	20–21				CL **Sandy clay** orangish brown; medium plasticity; fine to coarse sand; moist; no odor (0,30,70)

Delta
Consultants

Project No: **C106129051**
Logged By: **Ben Wright**
Driller: **Gregg Drilling & Testing**
Drilling Method: **HSA/Rhino**
Sampling Method: **SSS**
Casing Type: NA
Slot Size: NA
Gravel Pack: NA

Client: **ConocoPhillips**
Location: **3420 35th Avenue**
Oakland, CA
Hole Diameter: **5.25"**
Hole Depth: **36.5'**
Well Diameter: NA
Well Depth: NA
First Water Depth: **30.0'**

Boring/Well No: **B-16**
Date Drilled: **12/27/06**
Page **2** of **2**

▽ = First Water

Elevation | Northing | Easting

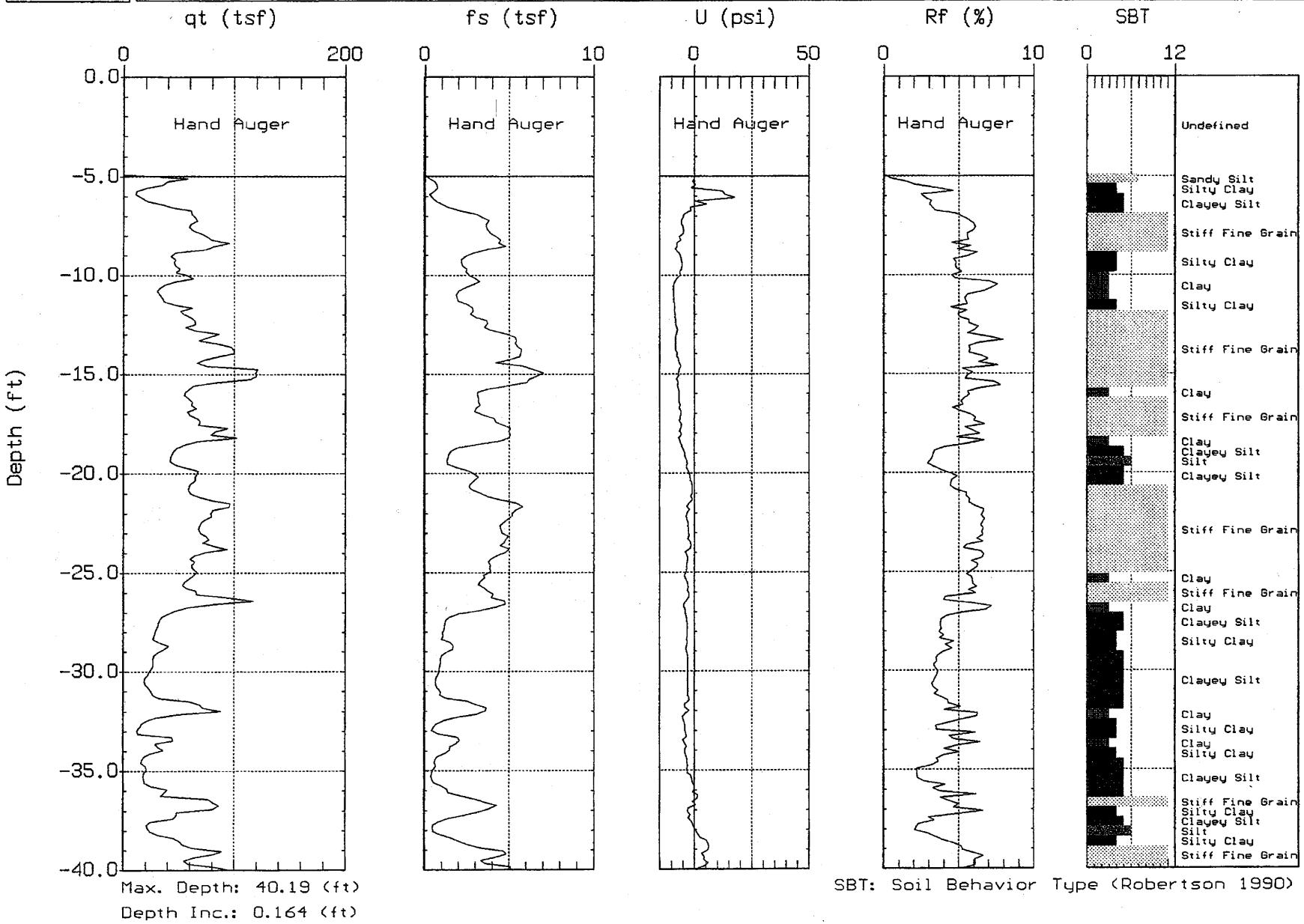
Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery / Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement					23			
					24			
					25			
		Moist	0.0	B-16 @25.5' 11:25	26			CL Same as above; reddish brown
					27			
					28			
					29			
	▽				30			
		Sat	0.4	B-16 @30.5' 11:30	31			CL **Clay with sand** medium plasticity; medium soft; saturated; no odor (0,15,85)
					32			
					33			
					34			
					35			
		Sat	0.4	B-16 @35.5' 11:35	36			CL Same as above
					37			Total Depth = 36.5 feet bgs
					38			
					39			
					40			
					41			
					42			
					43			
					44			

GREGG

DELTA ENV.

Site: 76 STATION #6129
Location: CPT-B2

Engineer: D.DAVIS
Date: 09:13:06 14:36



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

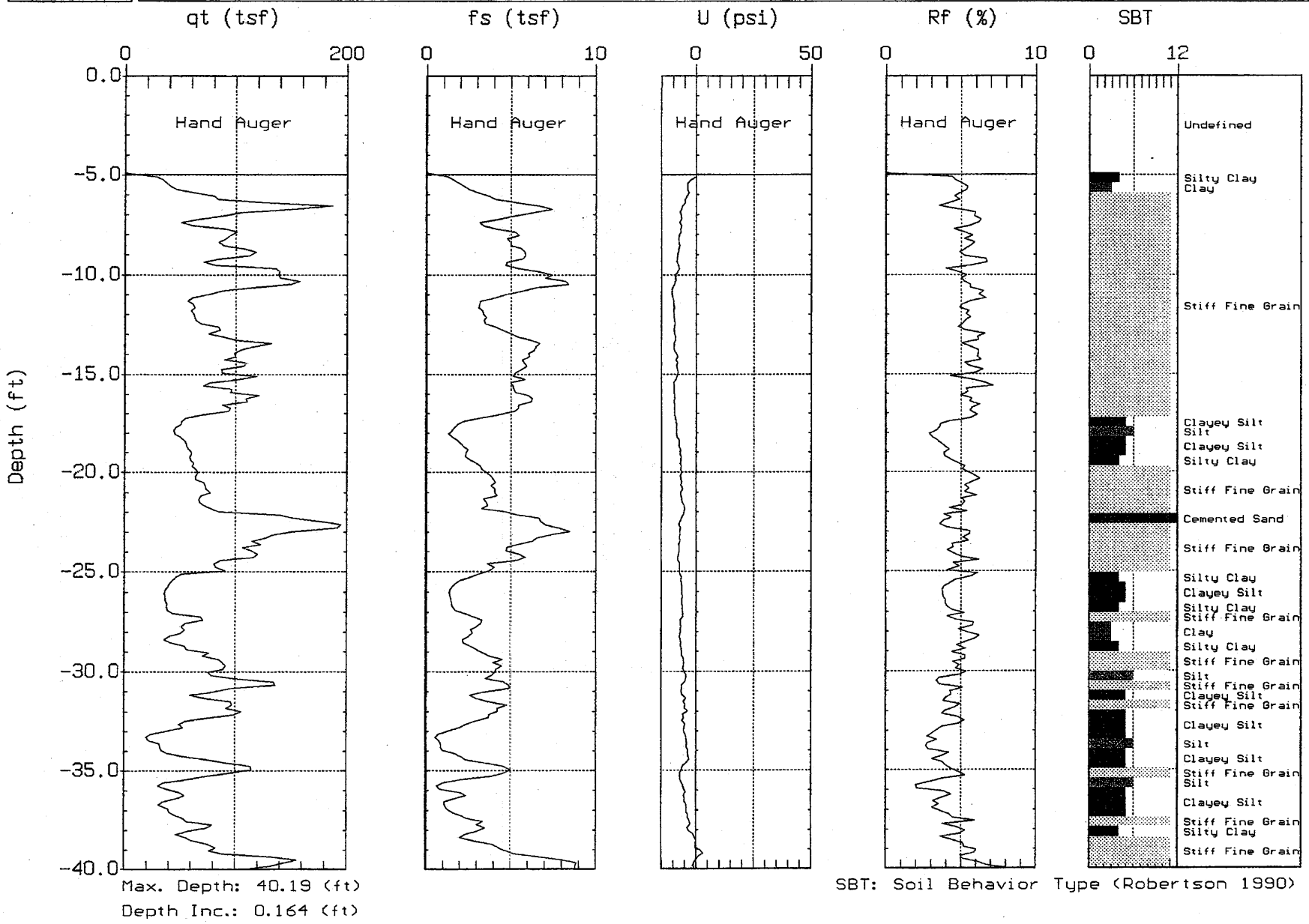
SBT: Soil Behavior Type (Robertson 1990)

GREGG

DELTA ENV.

Site: 76 STATION #6129
Location: CPT-B4

Engineer: D.DAVIS
Date: 09:13:06 08:49

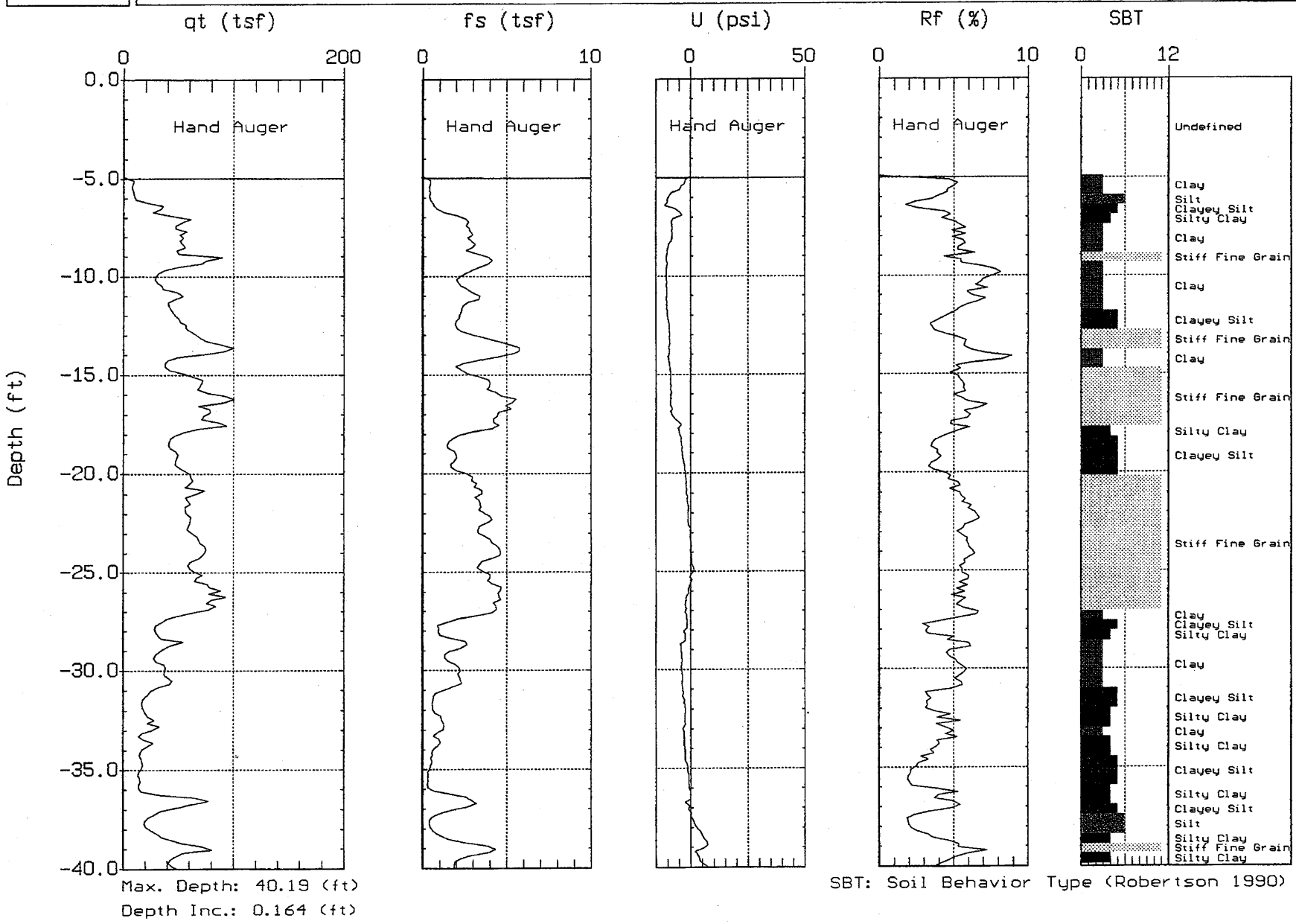


GREGG

DELTA ENV.

Site: 76 STATION #6129
Location: CPT-B7

Engineer: D.DAVIS
Date: 09:13:06 07:51



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

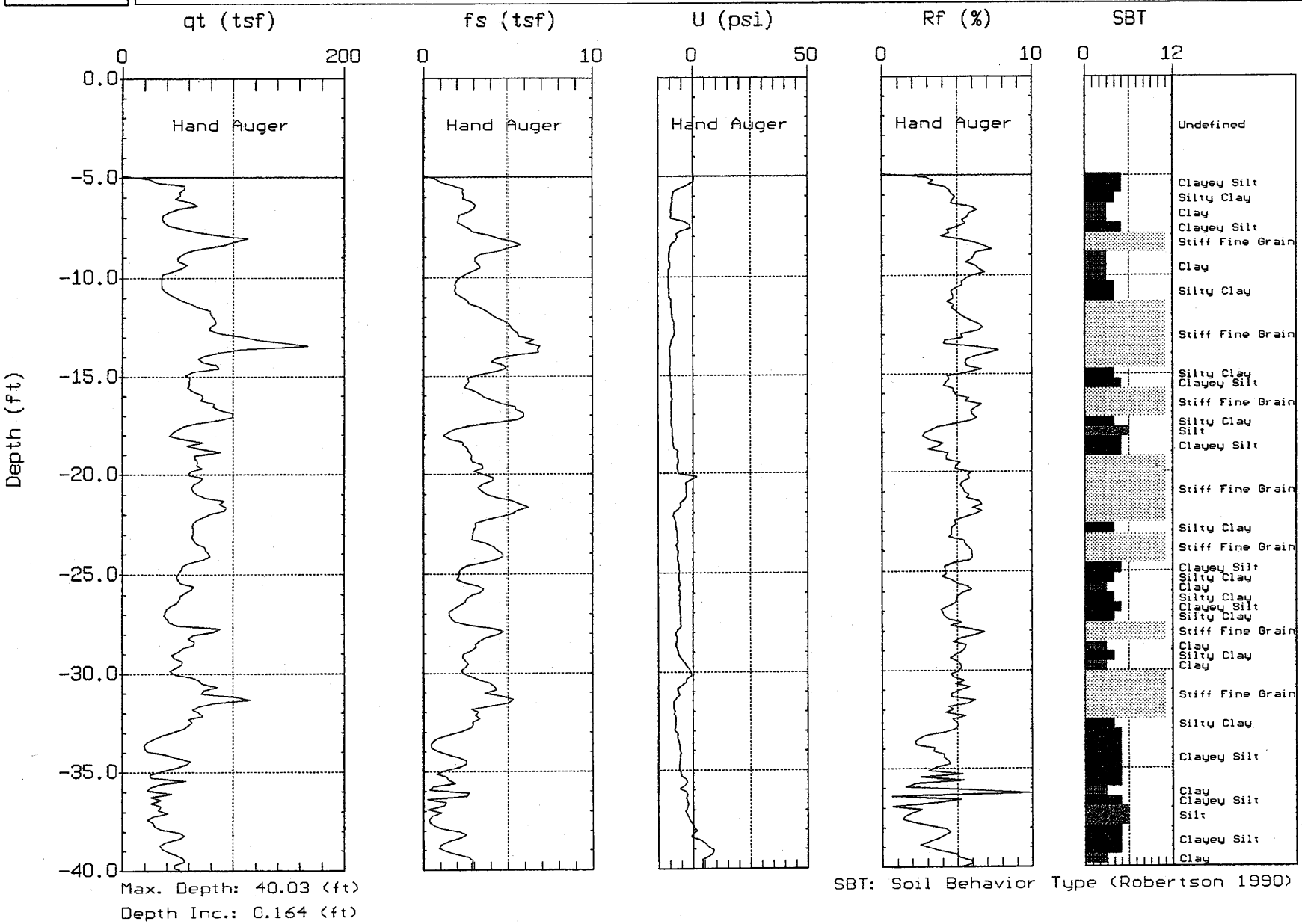
SBT: Soil Behavior Type (Robertson 1990)

GREGG

DELTA ENV.

Site: 76 STATION #6129
Location: CPT-B8

Engineer: D.DAVIS
Date: 09:13:06 09:40



Max. Depth: 40.03 (ft)
Depth Inc.: 0.164 (ft)

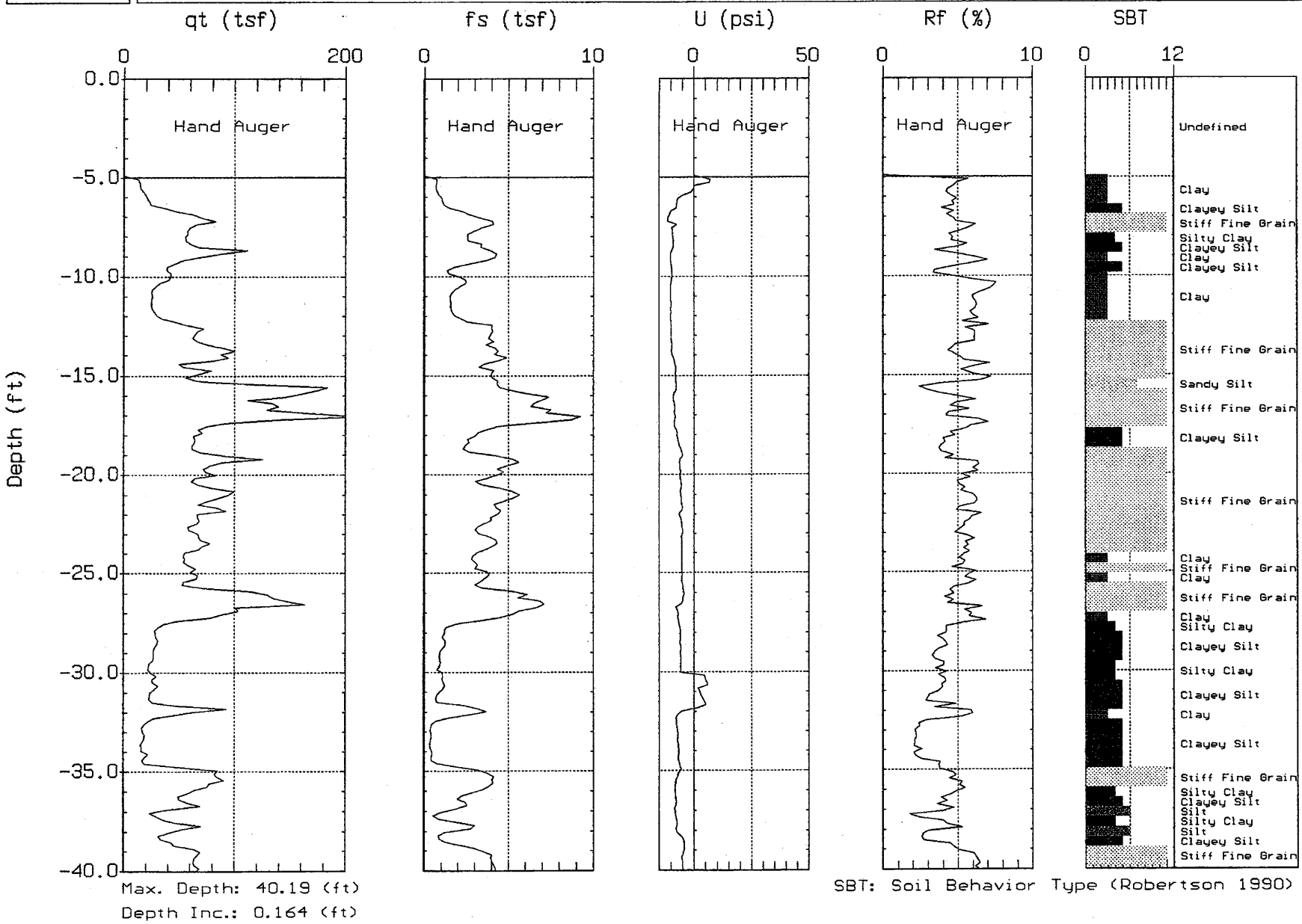
SBT: Soil Behavior Type (Robertson 1990)

GREGG

DELTA ENV.

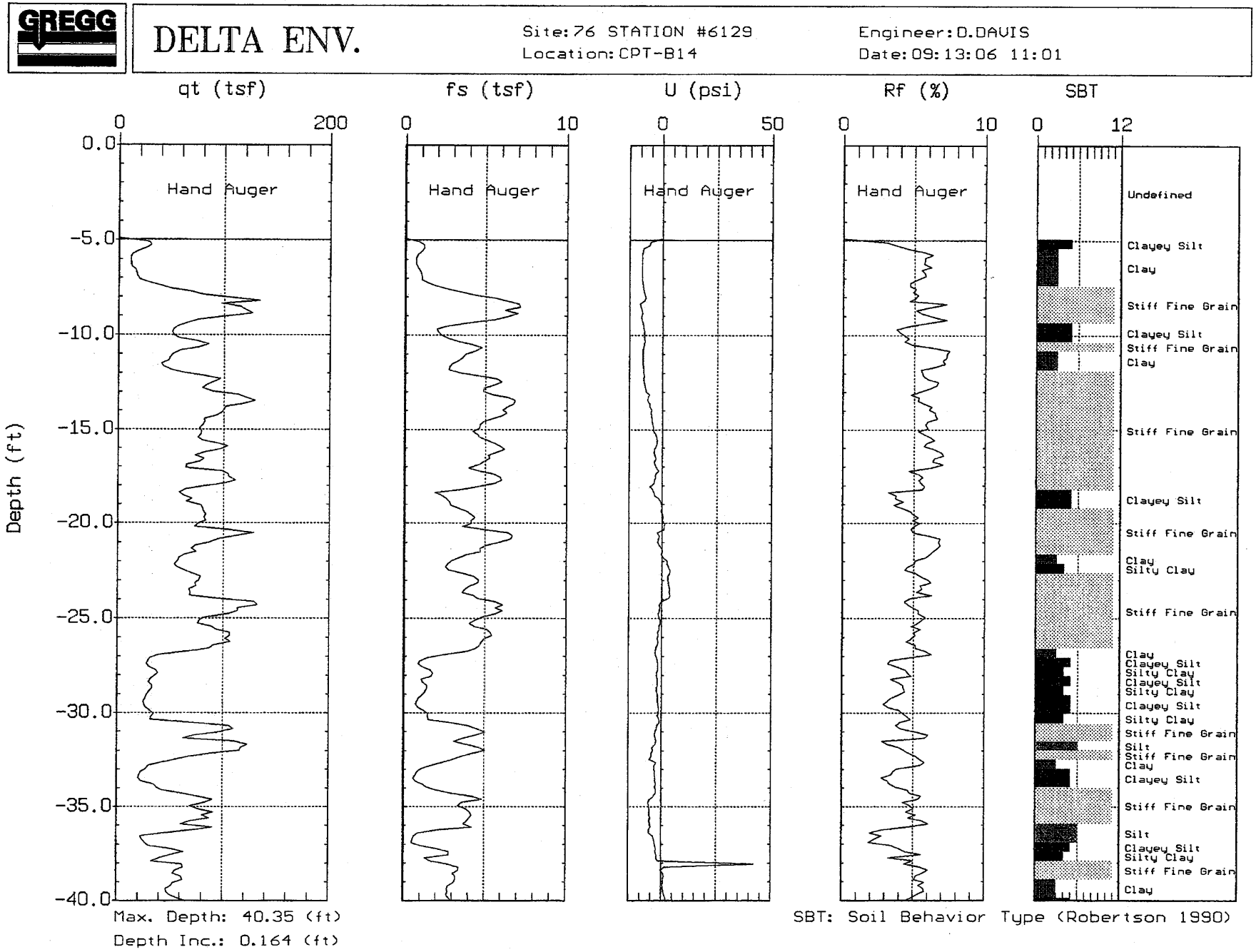
Site: 76 STATION #6129
Location: CPT-B10

Engineer: D.DAVIS
Date: 09:13:06 13:01



Max. Depth: 40.19 (ft)
Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson 1990)


GREGG
DELTA ENV.
Site: 76 STATION #6129
Location: CPT-B14
Engineer: D.DAVIS
Date: 09:13:06 11:01
qt (tsf)
fs (tsf)
U (psi)
Rf (%)
SBT
Depth (ft)
Hand Auger
Undefined
Clayey Silt
Clay
Stiff Fine Grain
Silty Clay
Silt
Max. Depth: 40.35 (ft)
Depth Inc.: 0.164 (ft)
SBT: Soil Behavior Type (Robertson 1990)

ENVIRONMENTAL RESOLUTIONS, INC.

BORING LOG B11

(Page 1 of 2)

Project No.:	: Former Exxon Service Station 70234
Site:	: 3450 35th Avenue, Oakland, California
Logged By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Reviewed By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Signature:	: Heidi Dieffenbach-Carle

Date Drilled:	: 09/10-11/2007, 11/14/2007
Drilling Co.:	: Woodward / Gregg
Drilling Method:	: Direct Push/Hollow-Stem
Sampling Method:	: Direct Push
Borehole Diameter:	: 6"
Casing Diameter:	: N/A
Location N-S	: 2115566.3
Location E-W	: 6069910.0
Total Depth:	: 38 fbgs
First GW Depth:	: 37 fbgs

Sample Condition
- No Recovery
- Sampled Interval
- Described Sample
- Preserved Sample

Water Levels
- First Encountered Water: 37'
- Second Encountered Water: NA

Boring: B11

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	DESCRIPTION
0						7-inches of Concrete. Cleared to 8.0 fbgs using a hand auger.
					FILL	PEA GRAVEL
					ML	CLAYEY SILT WITH SAND: strong brown, dry, fine-grained sand.
5					CL	SANDY CLAY WITH SILT: dark yellowish brown, damp, fine to medium grained sand.
10		0.0			SC	CLAYEY SAND WITH GRAVEL: fine to coarse grained sand, dark yellowish brown, dry to damp, dense; fine grained, angular to subangular gravel.
						@ 10 fbgs sand fragments - red, white, angular.
15		0.0				
		0.0				@ 15 fbgs large black volcanic rocks.
						@ 16 fbgs color becomes light olive brown.
20		0.0				
		0.0				
25						

Concrete

Neat Cement

12-13-2007 J:\2476\BORING LOGS\2476 B11.bor

ENVIRONMENTAL RESOLUTIONS, INC.

BORING LOG B11

(Page 2 of 2)

Project No.:	: Former Exxon Service Station 70234
Site:	: 3450 35th Avenue, Oakland, California
Logged By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Reviewed By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Signature:	: Heidi Dieffenbach-Carle

Date Drilled:	: 09/10-11/2007, 11/14/2007
Drilling Co.:	: Woodward / Gregg
Drilling Method:	: Direct Push/Hollow-Stem
Sampling Method:	: Direct Push
Borehole Diameter:	: 6"
Casing Diameter:	: N/A
Location N-S	: 2115566.3
Location E-W	: 6069910.0
Total Depth:	: 38 fbgs
First GW Depth:	: 37 fbgs

Sample Condition
- No Recovery
- Sampled Interval
- Described Sample
- Preserved Sample

Water Levels
- First Encountered Water: 37'
- Second Encountered Water: NA

Boring: B11

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	DESCRIPTION
25		0.0			SC	CLAYEY SAND WITH GRAVEL: fine to coarse grained sand, dark yellowish brown, dry to damp, dense; fine grained, angular to subangular gravel.
					CL	SANDY CLAY: dark yellowish brown, damp; fine to coarse grained, red, gray, black and white sand.
30		0.0			SC	CLAYEY SAND WITH GRAVEL: fine to coarse grained sand, dark yellowish brown, damp; medium to coarse grained, angular to subangular gravel.
		0.0			GC	CLAYEY GRAVEL WITH SAND: dark yellowish brown, damp, angular to subangular, gravel pieces are gray, black, white; fine to coarse grained, angular to subangular sand.
35					CL	SILTY CLAY: yellowish brown, moist, trace fine grained sand, trace orange staining. @36 fbgs SANDY CLAY: fine to medium grained sand.
		0.0			GW	SANDY GRAVEL: fine to medium grained, dark yellowish brown, moist, wet along clast boundaries, angular to subangular; medium to coarse grained, angular to subangular sand.
40						Cleared with a hand auger to 8.0 fbgs on 09/05/2007.
						Drilled with direct-push rig to @ 25.0 fbgs on 09/10/2007 and 09/11/2007.
						Drilling with hollow-stem augers on 11/14/2007
						Groundwater sampled @ 38 fbgs on 11/14/2007.
45						
50						

Neat Cement

12-13-2007 J:\2476\BORING LOGS\2476 B11.bor

ENVIRONMENTAL RESOLUTIONS, INC.

BORING LOG B12

(Page 1 of 1)

Project No.:	: Former Exxon Service Station 70234
Site:	: 3450 35th Avenue, Oakland, California
Logged By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Reviewed By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Signature:	: Heidi Dieffenbach-Carle

Date Drilled:	: 09/6/2007, 11/13/2007
Drilling Co.:	: Gregg Drilling Company
Drilling Method:	: Hollow-Stem Auger
Sampling Method:	: Direct Push
Borehole Diameter:	: 6"
Casing Diameter:	: N/A
Location N-S	: 2115563.4
Location E-W	: 6069891.0
Total Depth:	: 25 fbgs
First GW Depth:	: 15 fbgs

Sample Condition
- No Recovery
- Sampled Interval
- Described Sample
- Preserved Sample

Water Levels
- First Encountered Water: 15'
- Second Encountered Water: NA

Boring: B12

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	DESCRIPTION
0					FILL	PEA GRAVEL AND DEBRIS. Cleared to 8.0 fbgs using a hand auger.
5		0.0			ML	CLAYEY SILT: yellowish orange, damp, moderate plasticity, trace gravel. Cleared original location with a hand auger to 8.0 fbgs on 09/04/2007 Moved boring location due to proximity of buried utility.
10		0.0			FILL	SANDY GRAVEL: fiine grained gravel, dark grayish brown, moist; coarse-grained sand.
15		15			SC	CLAYEY SAND: fine to coarse grained, dark yellowish brown, damp to moist; trace gravel.
20		30				Cleared new boring location in tank pit excavation with a hand auger to 8.0 fbgs on 09/06/2007. Drilled with hollow-stem augers on 11/13/2007. Groundwater sampled @ 15 fbgs on 11/13/2007.
25						

Neat Cement

12-10-2007 J:\2476\BORING LOGS\2476 B12.bor

ENVIRONMENTAL RESOLUTIONS, INC.

BORING LOG B14

(Page 1 of 1)

Project No.:	: Former Exxon Service Station 70234
Site:	: 3450 35th Avenue, Oakland, California
Logged By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Reviewed By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Signature:	: Heidi Dieffenbach-Carle

Date Drilled:	: 09/6/2007, 11/13/2007
Drilling Co.:	: Gregg Drilling Company
Drilling Method:	: Hollow-Stem Auger
Sampling Method:	: Direct Push
Borehole Diameter:	: 6"
Casing Diameter:	: N/A
Location N-S	: 2115544.6
Location E-W	: 6069879.2
Total Depth:	: 21.5 fbgs
First GW Depth:	: 9.7 fbgs

Sample Condition
- No Recovery
- Sampled Interval
- Described Sample
- Preserved Sample

Water Levels
- First Encountered Water: 9.7' as measured in augers\A
- Second Encountered Water: NA

Boring: B14

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	DESCRIPTION
0						1 foot of 1/4 to 1/2-inch drain rock - gravel.
						GRAVELLY SAND: fine to coarse grained, very dark grayish brown, damp, well graded; fine grained gravel.
5					FILL	
10		0.0				SANDY GRAVEL: fiine grained, dark grayish brown, wet, subangular to subrounded; medium to coarse grained sand.
						Driller notes change in drilling conditions at 15 fbgs.
15		0.0			ML	SANDY SILT WITH CLAY: dark yellowish brown, damp; fine to medium sand; trace coarse grained sand; trace gravel.
					CL	SILTY CLAY WITH SAND: dark yellowish brown with faint mottling, damp; fine to coarse grained, multi-colored sand grains; fine grained, angular gravel.
20		0.0				
25						Cleared with a hand auger to 8.0 fbgs on 09/06/2007.
						Drilled with hollow-stem augers on 11/13/2007.
						Groundwater sampled @ 15 fbgs on 11/13/2007.

Neat Cement

12-10-2007 J:\2476\BORING LOGS\2476 B14.bor

BORING LOG B19

(Page 1 of 2)

Project No.:	: Former Exxon Service Station 70234
Site:	: 3450 35th Avenue, Oakland, California
Logged By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Reviewed By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Signature:	: Heidi Dieffenbach Carle

Date Drilled:	: 03/02/09, 03/03/09
Drilling Co.:	: Gregg Drilling Company
Drilling Method:	: Hollow-Stem Auger
Sampling Method:	: Direct Push
Borehole Diameter:	: 6"
Casing Diameter:	: NA
Location N-S	: 2115518.5
Location E-W	: 6069840.7
Total Depth:	: 40 fbgs
First GW Depth:	: 33 fbgs

Sample Condition
- No Recovery
- Sampled Interval
- Described Sample
- Preserved Sample

Water Levels
- First Encountered Water: 33'
- Second Encountered Water: NA

Boring: B19

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	DESCRIPTION
0					FILL	Concrete: 5 inches in thickness
						1/4-inch to 1/2-inch angular gravel
		0			CL	Sandy CLAY: yellowish brown (10YR 5/8) with pervasive orange staining, damp, medium plasticity, fine- to medium-grained sand, trace coarse-grained sand (50% Clay, 25% Silt, 25% Sand, 0% Gravel)
5		0			CL	Silty CLAY: light olive brown (2.5Y 5/4), damp, trace coarse-grained sand, trace subangular gravel, trace rootlets, trace clay stingers with bark material (80,15,3,2)
						@ 7.5 feet bgs: 3-inch diameter cobbles of volcanic rocks and 2-inch diameter green chert
10					CL	Sandy CLAY: dark yellowish brown (10YR 4/6), damp, medium plasticity, fine- to coarse-grained subangular sand (50,20,30,0)
15		2.6			CH	Silty CLAY: light yellowish brown (2.5Y 6/3), high plasticity, patches of dark yellowish brown, trace fine- to medium-grained sand (65,20,15,0)
					CL	Sandy CLAY: dark yellowish brown (10YR 4/6), damp, fine- to coarse-grained sand with multi-colored grains, black iron oxides
20		4.7				
		6.6			SC	Clayey SAND with Gravel: medium- to coarse-grained, dark yellowish brown (10YR 4/6), damp, fine-grained gravel, sand and gravel have multi-colored grains (30,15,40,15)
25						

Neat Cement

04-20-2009 F:\EXXONMOBIL\ExxonMobil Projects\022476 (70234) Oakland\2476 AutoCad\BORING LOGS\2476 B19.bor

BORING LOG B19

(Page 2 of 2)

Project No.:	: Former Exxon Service Station 70234
Site:	: 3450 35th Avenue, Oakland, California
Logged By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Reviewed By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Signature:	: Heidi Dieffenbach Carle

Date Drilled:	: 03/02/09, 03/03/09
Drilling Co.:	: Gregg Drilling Company
Drilling Method:	: Hollow-Stem Auger
Sampling Method:	: Direct Push
Borehole Diameter:	: 6"
Casing Diameter:	: NA
Location N-S	: 2115518.5
Location E-W	: 6069840.7
Total Depth:	: 40 fbgs
First GW Depth:	: 33 fbgs

Sample Condition
- No Recovery
- Sampled Interval
- Described Sample
- Preserved Sample

Water Levels
- First Encountered Water: 33'
- Second Encountered Water: NA

Boring: B19

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	DESCRIPTION
25		9.1			CL	Sandy CLAY: dark brown (7.5YR 3/4), damp, fine- to coarse-grained sand, trace angular gravel
					SC	Clayey SAND: medium- to coarse-grained, dark yellowish brown, damp, trace gravel
					CL	Sandy CLAY: dark brown (7.5YR 3/4), damp, fine- to coarse-grained sand, trace angular gravel
					CL	Silty CLAY: dark yellowish brown (10YR 4/6), damp, trace fine-grained sand, rootlets
		10.2			CL	Sandy CLAY: dark yellowish brown, fine- to coarse-grained sand with multi-colored grains, trace fine-grained, angular gravel (50,20,25,5)
30		79			CL	Silty CLAY: dark yellowish brown
					SC	Clayey SAND: fine- to medium-grained, dark yellowish brown (10YR 4/6), wet, poorly graded
		47			SC	Clayey SAND with Gravel: dark yellowish brown (10YR 4/6) (30,10,45,15)
35		21			CH	CLAY with Sand: dark yellowish brown (10YR4/6), moist, high plasticity, fine- to medium-grained sand, trace coarse-grained, angular sand, trace angular gravel (60,20,15,5)
		13.2			CL	Sandy CLAY: dark yellowish brown (10YR 4/6), damp, medium- to coarse-grained sand, trace fine-grained gravel (50,20,25,5)
40						
45						
50						

Neat Cement

Cleared to 8 feet bgs by 8-inches on 2/26/2009.

Cleared to 5 feet bgs with hand auger for collection of soil sample. Boring widened to 8-inches and deepened to 8 feet bgs using air/water knife and vacuum truck

Total Depth = 40.0 feet bgs, 15:00, 03/03/2009.

04-20-2009 F:\EXXONMOBIL\ExxonMobil Projects\022476 (70234) Oakland\2476 AutoCad\BORING LOGS\2476 B19.bor

BORING LOG MW6

(Page 1 of 2)

Project No.:	: Former Exxon Service Station 70234
Site:	: 3450 35th Avenue, Oakland, California
Logged By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Reviewed By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Signature:	: Heidi Dieffenbach Carle

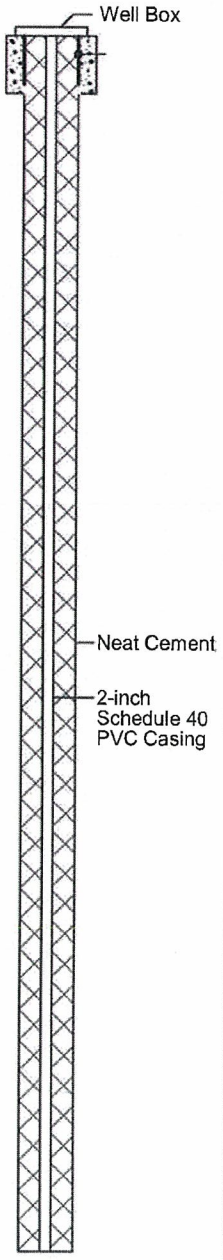
Date Drilled:	: 03/09/2009
Drilling Co.:	: Gregg Drilling Company
Drilling Method:	: Hollow-Stem Auger
Sampling Method:	: Direct Push
Borehole Diameter:	: 8"
Casing Diameter:	: 2"
Location N-S	: 2115519.6
Location E-W	: 6069858.6
Total Depth:	: 40 fbgs
First GW Depth:	: 33 fbgs

Sample Condition
- No Recovery
- Sampled Interval
- Described Sample
- Preserved Sample

Water Levels
- First Encountered Water: 33'
- Second Encountered Water: NA

Well: MW6

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	DESCRIPTION
0						Concrete: 6 inches in thickness.
		0.0			CL	Sandy CLAY: light olive brown (2.5Y 5/4) with pervasive yellowish brown staining, damp, medium plasticity, fine- to medium-grained sand, tree rootlets (45% Clay, 25% Silt, 30% Sand, 0% Gravel) @4 feet bgs: becoming dark yellowish brown (10YR 4/6), increase in medium-grained sand
5		0.0			CL	Sandy CLAY: dark yellowish brown (10YR 4/6), damp, medium- to coarse-grained sand, trace gravel (40,25,30,5)
10					CL	CLAY with Sand: dark yellowish brown (10YR 4/4), damp, fine-grained sand (60,25,15,0)
15					CL	CLAY with Sand: light olive brown (2.5Y 5/3), mottled dark yellowish brown, damp, fine- to medium-grained sand
					CL	Sandy CLAY: dark yellowish brown (10YR 4/4), damp, medium- to coarse-grained, well graded and angular sand with multi-colored grains, trace gravel (45,22,30,3)
20					CL	Sandy CLAY: dark yellowish brown (10YR 3/6), damp, fine- to coarse-grained, well graded and subrounded to angular sand, trace gravel, black iron oxides (45,15,35,5)
25						



BORING LOG MW6

(Page 2 of 2)

Project No.:	: Former Exxon Service Station 70234
Site:	: 3450 35th Avenue, Oakland, California
Logged By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Reviewed By:	: Heidi L. Dieffenbach-Carle, P.G. #6793
Signature:	: Heidi Dieffenbach-Carle

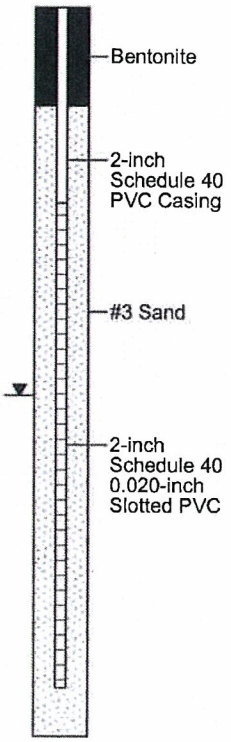
Date Drilled:	: 03/09/2009
Drilling Co.:	: Gregg Drilling Company
Drilling Method:	: Hollow-Stem Auger
Sampling Method:	: Direct Push
Borehole Diameter:	: 8"
Casing Diameter:	: 2"
Location N-S	: 2115519.6
Location E-W	: 6069858.6
Total Depth:	: 40 fbgs
First GW Depth:	: 33 fbgs

Sample Condition
- No Recovery
- Sampled Interval
- Described Sample
- Preserved Sample

Water Levels
- First Encountered Water: 33'
- Second Encountered Water: NA

Well: MW6

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	DESCRIPTION
25					CL	Sandy CLAY (continued): dark yellowish brown (10YR 3/6), damp, fine- to coarse-grained, well graded and subrounded to angular sand, trace gravel, black iron oxides (45,15,35,5)
					GC	Clayey GRAVEL: fine-grained gravel, yellowish brown (10YR 5/4), damp, subangular to angular, trace medium- to coarse-grained sand (30,15,20,35)
30					CL	CLAY with Sand: dark yellowish brown (10YR 4/6) with dark gray stringers, high plasticity, fine- to medium-grained sand (60,20,20,0)
					CL	Sandy CLAY: dark yellowish brown (10YR 4/6), low plasticity, fine- to medium-grained sand with multi-colored grains, trace fine-grained gravel (40,20,30,10)
35					SC	Clayey SAND with Gravel: medium- to coarse-grained, dark yellowish brown (10YR 3/6), moist to wet, subangular to angular, fine-grained gravel (30,10,60,10)
					CL	Sandy CLAY: dark yellowish brown (10YR 3/6), damp, medium- to coarse-grained, well graded and subangular sand, trace gravel
40						
45						
50						



Cleared to 5 feet bgs by 10-inches on 2/27/2009

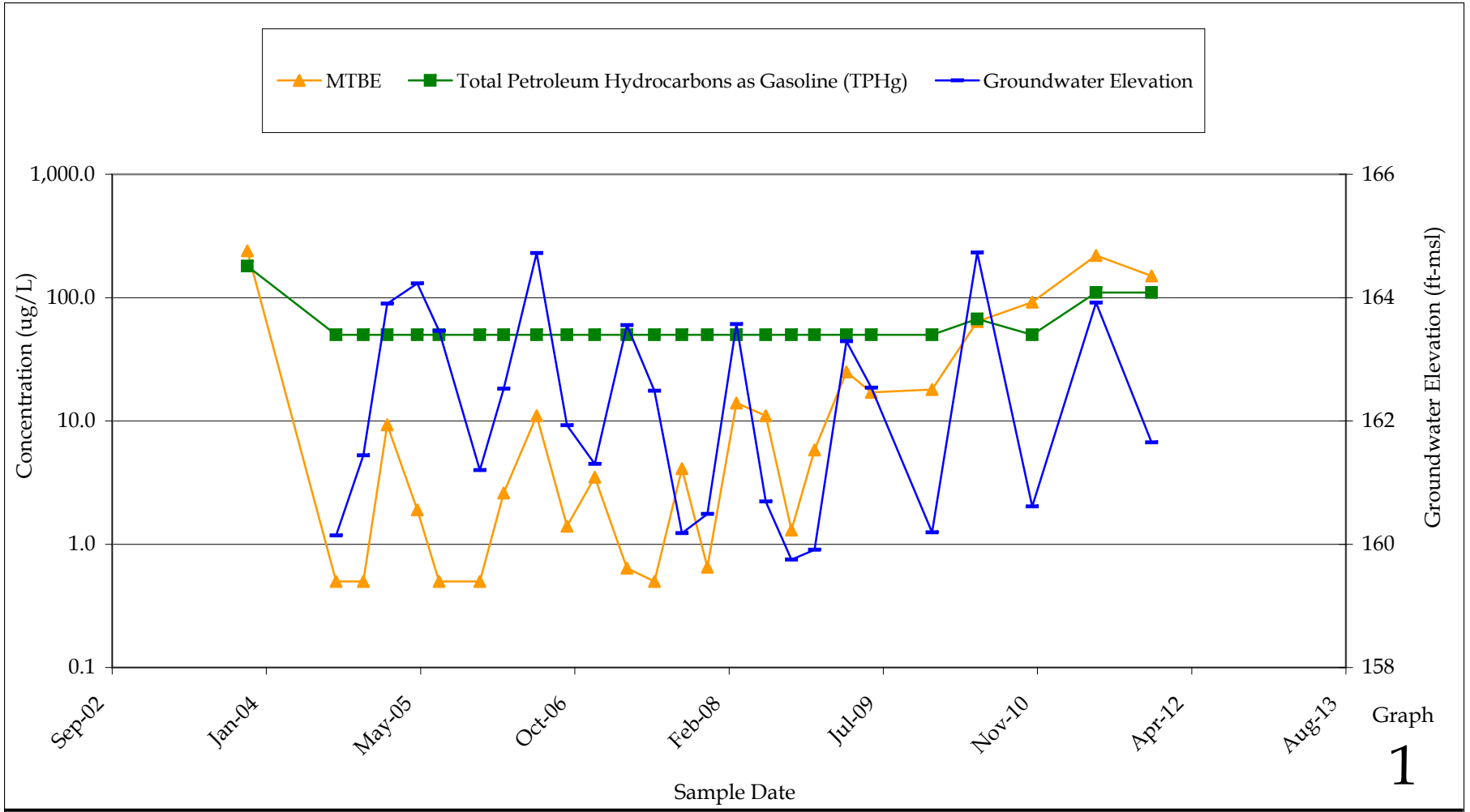
Cleared to 4 feet bgs with hand auger, airknife and vacuum.
Cleared to 5 feet bgs with hand auger for collection of soil sample.
Widened to 10-inches using airknife and vacuum.

Total Depth = 40 feet bgs, 10:15, 03/09/2009.

04-20-2009 F:\EXXONMOBIL\ExxonMobil Projects\022476 (70234) Oakland\2476 AutoCad\BORING LOGS\2476 MW6.bor

APPENDIX C

CONCENTRATION TREND GRAPHS



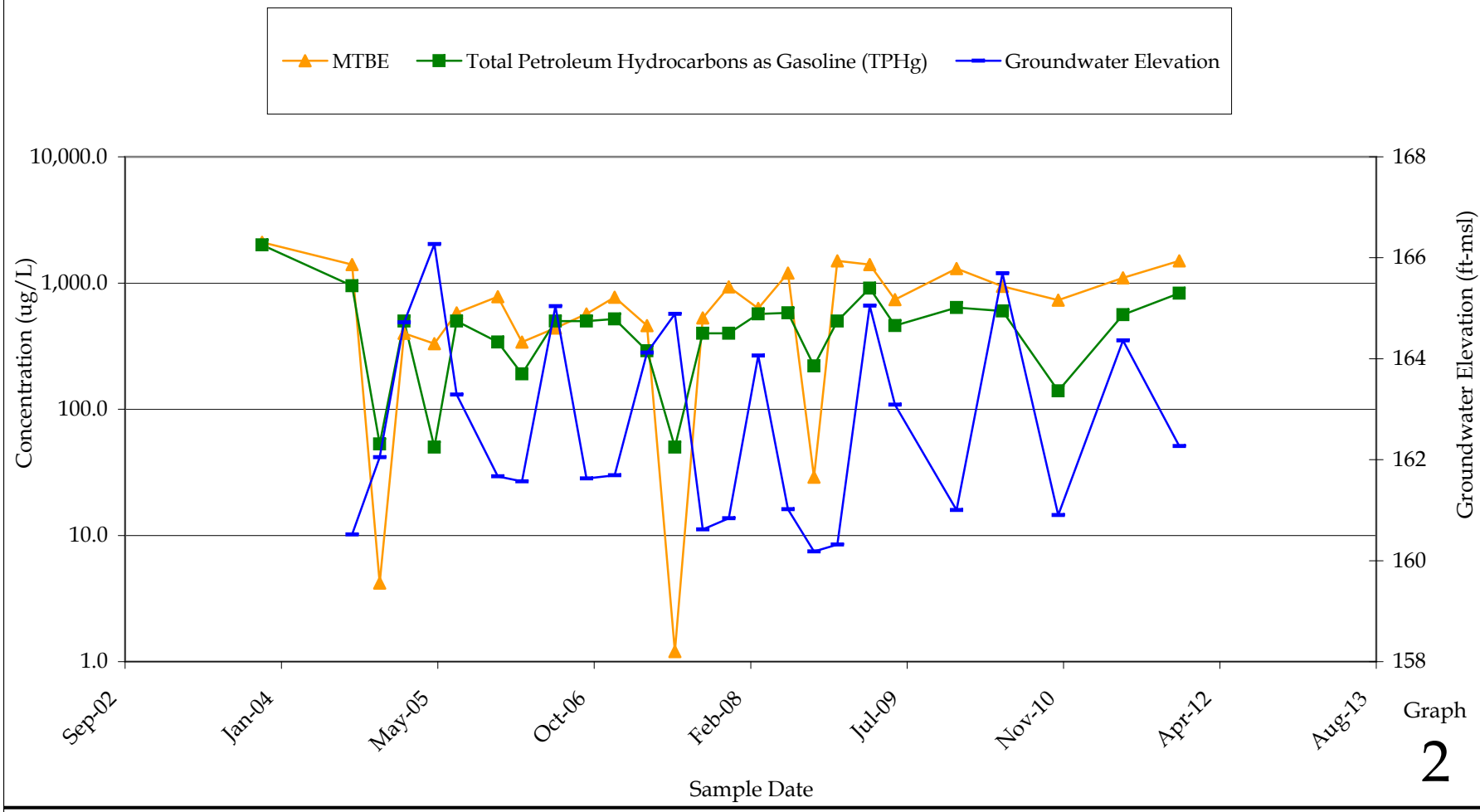
Graph 1

UNOCAL 6129
UNION OIL 351639
3420 35TH AVENUE
OAKLAND, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-1: TPHg AND MTBE CONCENTRATIONS AND GROUNDWATER ELEVATION VS. TIME

311784 (8)



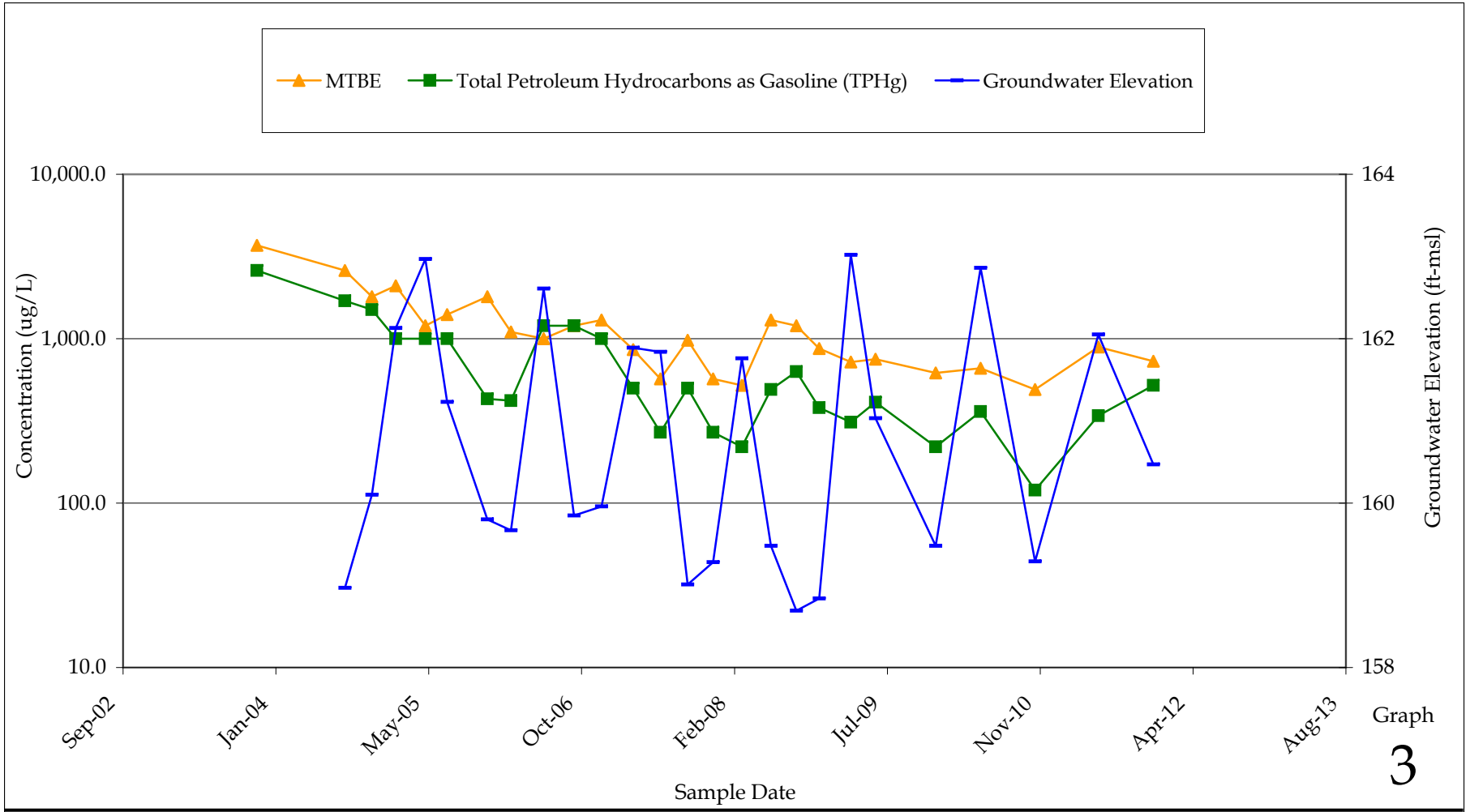
Graph 2

UNOCAL 6129
UNION OIL 351639
3420 35TH AVENUE
OAKLAND, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-2: TPHg AND MTBE CONCENTRATIONS AND GROUNDWATER ELEVATION VS. TIME

311784 (8)



Graph 3

UNOCAL 6129
UNION OIL 351639
3420 35TH AVENUE
OAKLAND, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-3: TPHg AND MTBE CONCENTRATIONS AND GROUNDWATER ELEVATION VS. TIME

311784 (8)

APPENDIX D

SECOND SEMI-ANNUAL 2011 GROUNDWATER MONITORING AND SAMPLING REPORT

Roya C. Kambin
Project Manager
Marketing Business Unit

Chevron Environmental Management Company
6101 Bollinger Canyon Road
San Ramon, CA 94583
Tel (925) 790-6270
RKLG@chevron.com

Alameda County Health Care Services Agency
Environmental Health Department
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Unocal #6129
Union Oil Company of California Site 351639
3420 35th Avenue
Oakland, CA

I have reviewed the attached report dated January 10, 2012.

I agree with the conclusions and recommendations presented in the referenced report. The information in this report is accurate to the best of my knowledge and all local Agency/Regional Board guidelines have been followed. This report was prepared by Conestoga-Rovers & Associates, upon whose assistance and advice I have relied.

This letter is submitted pursuant to the requirements of California Water Code Section 13267(b)(1) and the regulating implementation entitled Appendix A pertaining thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Sincerely,

Roya Kambin
Union Oil of California – Project Manager

Attachment: Report

CONESTOGA-ROVERS
& ASSOCIATES

5900 Hollis Street, Suite A
Emeryville, California 94608
Telephone: (510) 420-0700 Fax: (510) 420-9170
http://www.craworld.com

January 10, 2012 Reference No. 060722

Ms. Barbara Jakub
Alameda County Environmental Health (ACEH)
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: Second Semi-Annual 2011
Groundwater Monitoring and Sampling Report
Unocal #6129
Union Oil Company of California Facility ID No. 35-1639
3420 35th Avenue
Oakland, California
Fuel Leak Case No. RO0000058

Dear Ms. Barbara Jakub:

On behalf of Chevron Environmental Management Company, for itself and as Attorney-in-Fact for Union Oil Company of California (hereinafter "EMC"), Conestoga-Rovers & Associates is pleased to submit the *Second Semi-Annual 2011 Groundwater Monitoring and Sampling Report* for the site referenced above (Figure 1).

TRC Solutions (TRC) of Irvine, California sampled the wells and their November 30, 2011 *Groundwater Monitoring Data* is presented as Attachment A. Current groundwater monitoring and sampling data are presented in Table 1. BC Laboratories of Bakersfield, California, performed the analysis and their December 6, 2011 *Analytical Results* are included as Attachment B. Historical groundwater monitoring and sampling data is included as Attachment C. Groundwater monitoring and sampling was coordinated with the adjacent former Exxon Service Station 70234 and their groundwater data are presented as Attachment D.

RESULTS OF SECOND SEMI-ANNUAL 2011 EVENT

On November 23, 2011, TRC sampled the wells per the established schedule.

Groundwater data from the current monitoring event indicate the following:

- Groundwater Flow Direction Southwest
- Hydraulic Gradient 0.017

- Approximate Depth to Groundwater 26 to 29 feet below grade

Summarized analytical results of the current sampling event are presented below in Table A:

TABLE A: GROUNDWATER ANALYTICAL DATA

Well ID	*TPPH (TPHg) (µg/L)*	*Benzene (µg/L)*	*Toluene (µg/L)*	*Ethylbenzene (µg/L)*	*Total Xylenes (µg/L)*	*MTBE (µg/L)*
ESLs	***100***	***1***	***40***	***30***	***20***	***5***
MW-1	**110**	<0.50	<0.50	<0.50	<1.0	**150**
MW-2	**830**	<0.50	<0.50	<0.50	<1.0	**1,500**
MW-3	**520**	<0.50	<0.50	<0.50	<1.0	**730**

TPPH Total Purgeable Petroleum Hydrocarbons = Total Petroleum Hydrocarbons as Gasoline (TPHg)
MTBE Methyl tertiary butyl ether
µg/L Micrograms per Liter
< x.x Not reported above laboratory Practical Quantitation Limit
ESLs Environmental Screening Levels (Table F-1a) for groundwater that is a current or potential drinking water resource; *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*; California Regional Water Quality Control Board - San Francisco Bay Region; Interim Final November 2007, Revised May 2008.

CONCLUSIONS AND RECOMMENDATIONS

The results of ongoing groundwater monitoring and sampling indicate the following:

- No benzene, toluene, ethylbenzene, or xylenes were detected.
- The laboratory report narrative indicates that the Total Purgeable Petroleum Hydrocarbon (TPPH) detection in MW-3 does not exhibit a "gasoline" pattern. TPPH is entirely due to methyl tertiary butyl ether (MTBE).
- The laboratory report narrative indicates PQL's and MDL's are raised in MW-2 and MW-3 results due to sample dilution.
- MTBE concentrations are declining or stable.

CRA recommends continuing coordinated semi-annual monitoring and sampling with Exxon Service Station 70234 to verify decreasing concentration trends over time.

ANTICIPATED FUTURE ACTIVITIES

Groundwater Monitoring
TRC will sample the wells per the established schedule and CRA will submit a groundwater monitoring and sampling report.

Downgradient Assessment
Upon agency approval of Antea Group's January 25, 2010 *Proposed Monitoring Well Addendum Letter*, CRA will install one additional groundwater monitoring well to assess the downgradient extent of MTBE and submit a report documenting the activities. No approval has been provided to date.

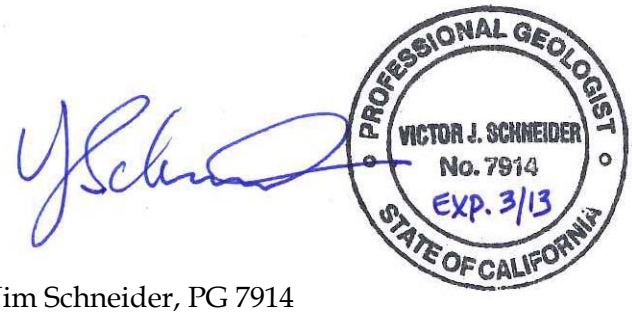
CONESTOGA-ROVERS & ASSOCIATES

January 10, 2012 Reference No. 060722

Please contact Jim Schneider at 949-648-5200 if you have any questions or require additional information.

Sincerely,

CONESTOGA-ROVERS & ASSOCIATES



Jim Schneider, PG 7914

IH/cw/3
Encl.

Figure 1	Vicinity Map
Figure 2	Groundwater Elevation and Hydrocarbon Concentration Map – November 23, 2011
Table 1	Groundwater Monitoring and Sampling Data
Attachment A	Monitoring Data Package
Attachment B	Laboratory Analytical Report
Attachment C	Historical Groundwater Monitoring and Sampling Data
Attachment D	Exxon Groundwater Monitoring and Sampling Data

cc: Ms. Roya Kambin, Union Oil Company of California
Son Nguyen & Le Pham, Nguyen/Pham Family Trust, Property Owner

FIGURES

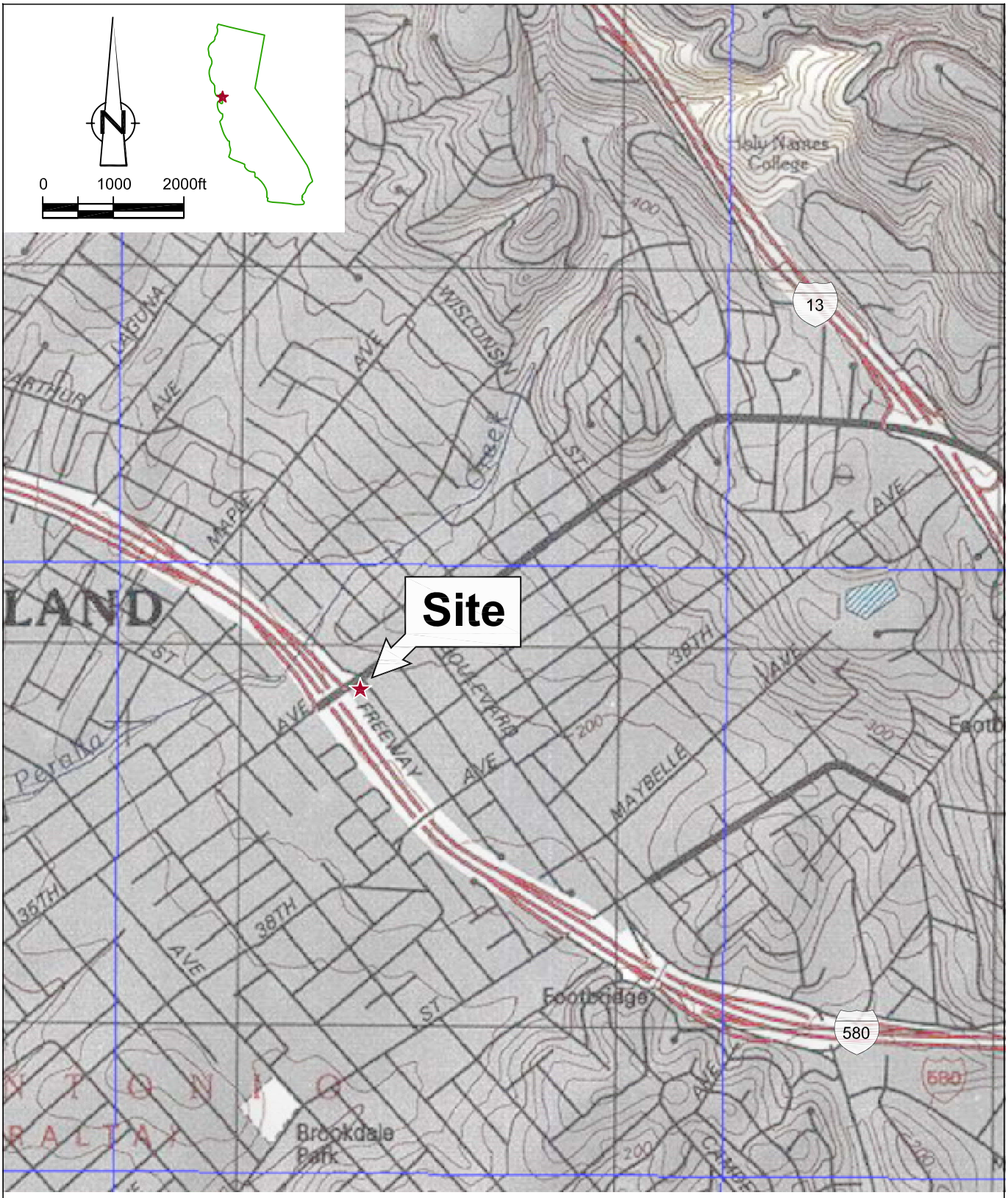


Figure 1

VICINITY MAP
UNOCAL 6129
3420 35th AVENUE
Oakland, California

060722-95(003)GN-EM001 JAN 2, 2012

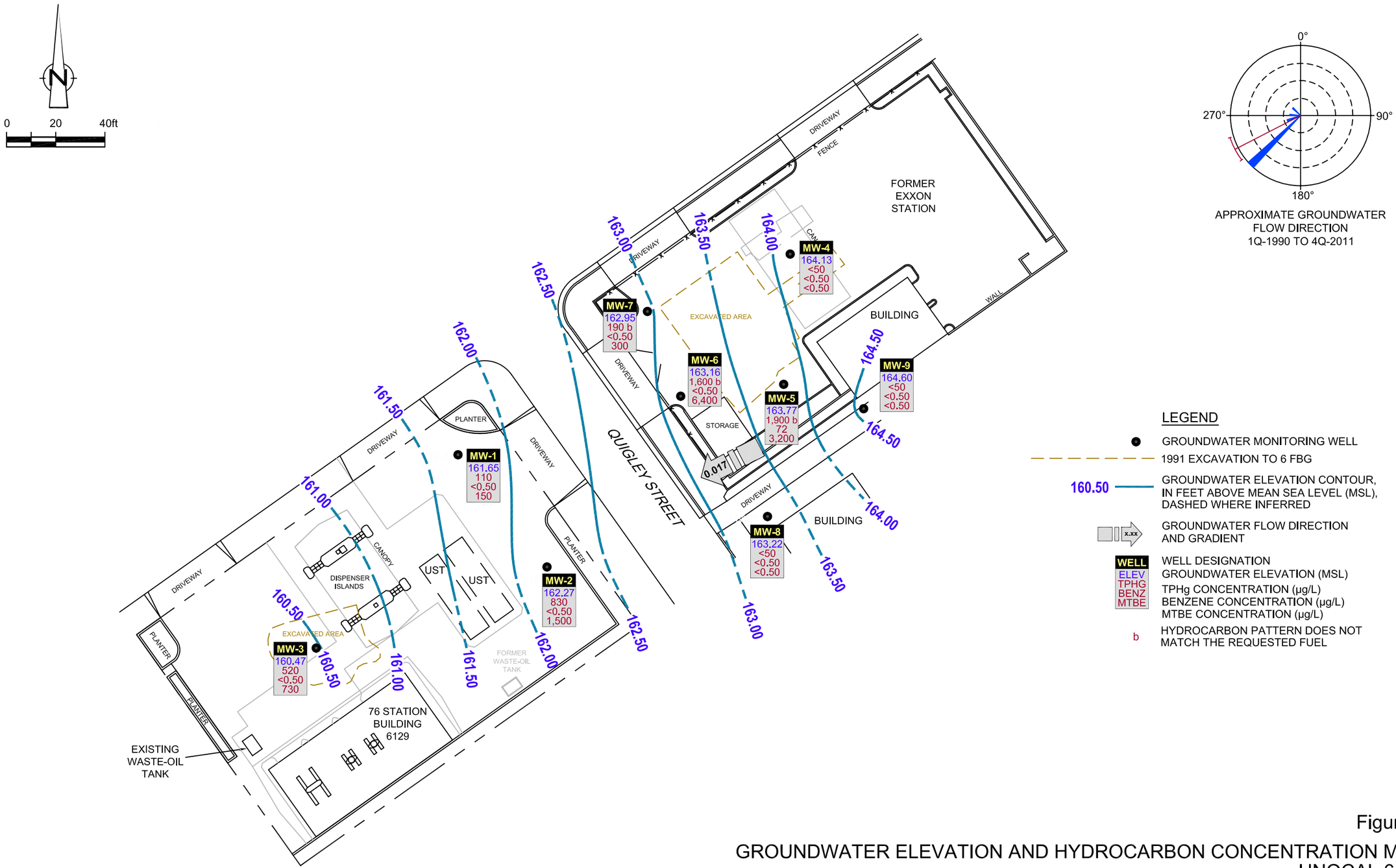


Figure 2

GROUNDWATER ELEVATION AND HYDROCARBON CONCENTRATION MAP
UNOCAL 6129
3420 35TH AVENUE
Oakland, California
November 23, 2011

SOURCE: DELTA CONSULTANTS, FIGURE 2, SITE PLAN WITH HISTORIC SAMPLING LOCATIONS , DATED 11/02/2009.

TABLE

TABLE 1
GROUNDWATER MONITORING AND SAMPLING DATA
UNION OIL #6129
3420 35TH AVE., OAKLAND, CALIFORNIA

					HYDROCARBONS	*PRIMARY VOCS*												
Location	Date	*TOC*	*DTW*	*GWE*	*TPH - Gasoline*	*B*	*T*	*E*	*X*	*MTBE by SW8260*	*TBA*	*ETBE*	*DIPE*	*TAME*	*EDB*	*1,2-DCA*	*Ethanol*
	Units	*ft*	*ft*	*ft-amsl*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
MW-1	05/27/2011	190.79	26.87	163.92	110	<0.50	<0.50	<0.50	<1.0	220	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<250
MW-1	**11/23/2011**	**190.79**	**29.14**	**161.65**	**110**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**150**	**41**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<250**
MW-2	05/27/2011	190.80	26.44	164.36	560	<0.50	<0.50	<0.50	<1.0	1,100	210	<0.50	<0.50	<0.50	<0.50	<0.50	<250
MW-2	**11/23/2011**	**190.80**	**28.53**	**162.27**	**830**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**1,500**	**400**	**<0.50**	**9.0**	**<0.50**	**<0.50**	**<0.50**	**<250**
MW-3	05/27/2011	188.58	26.53	162.05	340	<0.50	<0.50	<0.50	<1.0	890	73	<0.50	<0.50	<0.50	<0.50	<0.50	<250
MW-3	**11/23/2011**	**188.58**	**28.11**	**160.47**	**520**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**730**	**170**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<250**

TABLE 1
GROUNDWATER MONITORING AND SAMPLING DATA
UNION OIL #6129
3420 35TH AVE., OAKLAND, CALIFORNIA

					HYDROCARBONS	*PRIMARY VOCS*												
Location	Date	*TOC*	*DTW*	*GWE*	*TPH - Gasoline*	*B*	*T*	*E*	*X*	*MTBE by SW8260*	*TBA*	*ETBE*	*DIPE*	*TAME*	*EDB*	*1,2-DCA*	*Ethanol*
	Units	*ft*	*ft*	*ft-amsl*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*

Abbreviations and Notes:

TOC = Top of Casing

DTW = Depth to Water

GWE = Groundwater elevation

(ft-amsl) = Feet Above Mean sea level

ft = Feet

µg/L = Micrograms per Liter

TPH - Total Petroleum Hydrocarbons

VOCS = Volatile Organic Compounds

B = Benzene

T = Toluene

E = Ethylbenzene

X = Xylene

MTBE = Methyl tert butyl ether

TBA = Tert-Butyl alcohol

DIPE = Diisopropyl ether

ETBE = Tert-Butyl ethyl ether

TAME = Tert-Amyl methyl ether

EDB = 1,2-Dibromoethane (Ethylene dibromide)

1,2-DCA = 1,2-Dichloroethane

-- = Not available / not applicable

<x = Not detected above laboratory method detection limit

ATTACHMENT A

MONITORING DATA PACKAGE

123 Technology Drive West
Irvine, CA 92618

949.727.9336 PHONE
949.727.7399 FAX

www.TRCsolutions.com

DATE: November 30, 2011

TO: Michael McDonald
CRA
175 Technology Drive, Suite 150
Irvine, California 92618

SITE: Unocal Site 6129
Facility 351639
3420 35th Avenue, Oakland, CA

RE: Transmittal of Groundwater Monitoring Data

Dear Mr. McDonald,

Please find attached the field data sheets, chain of custody (COC) forms, and technical services request (TSR) form for the monitoring event that was completed on November 23, 2011. Field measurements and collection of samples submitted to the laboratory were completed in general accordance with our usual groundwater monitoring protocol which is also attached for your reference.

Please call me at 949-341-7440 if you have questions.

Sincerely,

TRC

Anju Farfan
Groundwater Program Operations Manager

GENERAL FIELD PROCEDURES

Groundwater Gauging and Sampling Assignments

For each site, TRC technicians are provided with a Technical Service Request (TSR) that specifies activities required to complete the groundwater gauging and sampling assignment for the site. TSRs are based on client directives, instructions from the primary environmental consultant for the site, regulatory requirements, and TRC's previous experience with the site.

Fluid Level Measurements (Gauging)

Initial site activities include determination of well locations based on a site map provided with the TSR. Well boxes are opened and caps are removed. Indications of well or well box damage or of pressure buildup in the well are noted.

Fluid levels in each well are measured using a coated cloth tape equipped with an electronic interface probe, which distinguishes between liquid phase hydrocarbon (LPH) and water. The depth to LPH (if it is present), to water, and to the bottom of the well are measured from the top of the well casing (surveyors mark or notch if present) to the nearest 0.01 foot. Unless otherwise instructed, a well with less than 0.67 foot between the measured top of water and the measured bottom of the well casing is considered dry, and is not sampled. If the well contains 0.67 foot or more of water, an attempt is made to bail and/or sample as specified on the TSR.

Unless otherwise instructed, a well that is found to contain a measureable amount of LPH (0.01 foot) is not purged or sampled. Instead, one casing volume of fluid is bailed from the well and the well is re-sealed.

Purging and Groundwater Parameter Measurement

TSR instructions may specify that a well not be purged (no-purge sampling), be purged using low-flow methods, or be purged using conventional pump and/or bail methods. Conventional purging generally consists of pumping or bailing until a minimum of three casing volumes of water have been removed or until the well has been pumped dry. Pumping is generally accomplished using submersible electric or pneumatic diaphragm pumps. The pump intake is initially set at about 5 feet below the level of water in the casing, and is lowered as needed to compensate for falling water level. Pump depths are recorded in Field Notes.

During conventional purging, three groundwater parameters (temperature, pH, and conductivity) are measured after removal of each casing volume. Stabilization of these parameters, to within 10 percent, confirm that sufficient purging has been completed. In some cases, the TSR indicates that other parameters are also to be measured during purging. TRC commonly measures dissolved oxygen (DO), oxidation-reduction potential (ORP), and/or turbidity. Instruments used for groundwater parameter measurements are calibrated daily according to manufacturer's instructions.

Low-flow purging utilizes a bladder or peristaltic pump to remove water from the well at a low rate. Groundwater parameters specified by the TSR are measured continuously, using a flow cell, until they become stable in general accordance with EPA guidelines.

Groundwater Sample Collection

After wells are purged, or not purged, according to TSR instructions, samples are collected for laboratory analysis. For wells that have been purged using conventional pump or bail methods, sampling is conducted after the well has recovered to 80 percent of its original volume or after two hours if the well does not recover to at least 80 percent. If there is insufficient recharge of water in the well after two hours, the well is not sampled.

GENERAL FIELD PROCEDURES

Samples are collected by lowering a new, disposable polyethylene bottom-fill bailer to just below the water level in the well. The bailer is retrieved and the water sample is carefully transferred to containers specified for the laboratory analytical methods indicated by the TSR. Particular care is given to containers for volatile organic analysis (VOAs) which require filling to zero headspace and fitting with Teflon-sealed caps.

Sample containers are labeled with project number (or site number), well designation, sample date, sample time, and the sampler's initials, and placed in an insulated chest with ice. Samples remain chilled prior to and during transport to a state-certified laboratory for analysis. Sample container descriptions and requested analyses are entered onto a chain-of-custody form in order to provide instructions to the laboratory. The chain-of-custody form accompanies the samples during transportation to provide a continuous record of possession from the field to the laboratory. If a freight or overnight carrier transports the samples, the carrier is noted on the form.

For wells that have been purged using low-flow methods, sample containers are filled from the effluent stream of the bladder or peristaltic pump. In some cases, if so specified by the TSR, samples are taken from the sample ports of actively pumping remediation wells.

Sequence of Gauging, Purging and Sampling

The sequence in which monitoring activities are conducted is specified on the TSR. In general, wells are gauged beginning with the least affected well and ending with the well that has the highest concentration based on previous analytic results. After all gauging for the site is completed, wells are purged and/or sampled from the least-affected to the most-affected well. If wells must be gauged or sampled out of order, alternate interface probes and/or pumps are utilized and are noted in field documentation.

Decontamination

In order to reduce the possibility of cross contamination between wells, strict isolation and decontamination procedures are observed. Portable pumps are not used in wells with LPH. Technicians wear nitrile gloves during all gauging, purging, and sampling activities. Gloves are changed between wells and more often if warranted. Any equipment that could come in contact with fluids are either dedicated a particular well, decontaminated prior to each use, or discarded after a single use. Decontamination consists of washing in a solution of Liquinox and water and rinsing twice. The final rinse is in deionized water.

Purge Water Disposal

Purge water is generally collected in labeled drums for disposal as non-hazardous waste. Drums may be left on site for disposal by others, or transported to a collection location at a TRC field office, in either Fullerton, California or Concord, California, for eventual transfer to a licensed treatment or recycling facility. Alternatively, purge water may be collected directly from the site by a licensed vacuum truck company, or may be treated on site by an active remediation system, if so directed.

Exceptions

Additional tasks or non-standard procedures, if any, that may be requested or required for a particular site, are documented in field notes on the following pages.

FIELD MONITORING DATA SHEET

Technician: A. Vidlers Job #/Task #: 183487.0035.1639 Date: 11/23/11

Site # 6129 Project Manager AF Page 1 of 1

Well #	TOC	Time Gauged	Total Depth	Depth to Water	Depth to Product	Product Thickness (feet)	Time Sampled	Misc. Well Notes
MW-1	✓	0525	43.48	29.14	—	—	0614	2"
MW-3	✓	0530	39.44	28.11	—	—	0655	2"
MW-2	✓	0534	43.61	28.53	—	—	0723	2"

FIELD DATA COMPLETE QA/QC COC WELL BOX CONDITION SHEETS

MANIFEST DRUM INVENTORY TRAFFIC CONTROL

TRC

GROUNDWATER SAMPLING FIELD NOTES

Technician: A. Vickers

Site: 6129 Project No.: 183487.0035.1639 Date: 11/23/11

Well No. MW-1 Purge Method: Sub

Depth to Water (feet): 29.14 Depth to Product (feet): —

Total Depth (feet) 43.48 LPH & Water Recovered (gallons): —

Water Column (feet): 14.34 Casing Diameter (Inches): 2

80% Recharge Depth(feet): 32.01 1 Well Volume (gallons): 3.

Time Start	Time Stop	Depth to Water (feet)	Volume Purged (gallons)	Conductivity (µS/cm)	Temperature (F , C)	pH	D.O. (mg/L)	ORP	Turbidity
Pre-Purge							3.21	195	
0600			3	776.2	17.5	6.74	2.87	174	
			6	809.1	18.6	6.69	1.32	174	
	0607		9	903.5	18.9	6.65	1.01	174	

Static at Time Sampled	Total Gallons Purged	Sample Time
32.01	9	0614

Comments: Pump depth = 34 ft. Adjusted as water level dropped.

Well No. MW-3 Purge Method: Sub

Depth to Water (feet): 28.11 Depth to Product (feet): —

Total Depth (feet) 39.44 LPH & Water Recovered (gallons): —

Water Column (feet): 11.33 Casing Diameter (Inches): 2

80% Recharge Depth(feet): 30.38 1 Well Volume (gallons): 2

Time Start	Time Stop	Depth to Water (feet)	Volume Purged (gallons)	Conductivity (µS/cm)	Temperature (F , C)	pH	D.O. (mg/L)	ORP	Turbidity
Pre-Purge							0.92	177	
0634			2	504.3	18.0	7.14	1.46	179	
			4	503.2	18.6	7.10	0.87	179	
	0639		6	522.6	18.7	7.07	1.02	179	

Static at Time Sampled	Total Gallons Purged	Sample Time
30.38	6	0655

Comments: Dry at 6 gallons.

TRC

GROUNDWATER SAMPLING FIELD NOTES

Technician: A. Viders

Site: 6129 Project No.: 183487.0035.1639 Date: 11/23/11

Well No. MW-2 Purge Method: Sub

Depth to Water (feet): 28.53 Depth to Product (feet): —

Total Depth (feet) 43.61 LPH & Water Recovered (gallons): —

Water Column (feet): 15.08 Casing Diameter (Inches): 2

80% Recharge Depth(feet): 31.55 1 Well Volume (gallons): 3.

Time Start	Time Stop	Depth to Water (feet)	Volume Purged (gallons)	Conductivity (µS/cm)	Temperature (F , C)	pH	D.O. (mg/L)	ORP	Turbidity
Pre-Purge							1.04	181	
0706			3	739.7	17.5	6.95	1.61	188	
			6	804.7	18.5	6.83	0.79	192	
	0713		9	878.9	18.8	6.77	0.68	194	

Static at Time Sampled	Total Gallons Purged	Sample Time
30.78	9	0723

Comments: Pump depth = 34 ft. Adjusted as water level dropped.

Well No. Purge Method:

Depth to Water (feet): Depth to Product (feet):

Total Depth (feet) LPH & Water Recovered (gallons):

Water Column (feet): Casing Diameter (Inches):

80% Recharge Depth(feet): 1 Well Volume (gallons):

Time Start	Time Stop	Depth to Water (feet)	Volume Purged (gallons)	Conductivity (µS/cm)	Temperature (F , C)	pH	D.O. (mg/L)	ORP	Turbidity
Pre-Purge									

Static at Time Sampled	Total Gallons Purged	Sample Time

Comments:

TRC

WELL BOX CONDITION REPORT

SITE NO. 6129

ADDRESS 3420 35th Ave. Oakland, CA

DATE 11/23/11

PERFOMED BY: A. Vidnes

PAGE 1 OF 1

Well Name	Current Well Box Size	# of Ears	# of Stripped Ears	# of Broken Ears	# of Broken Bolts	# of Missing Bolts	Seal Damaged	Missing Lid	Broken Lid	Well Box Is Exposed	Well Box Is Below Grade	Unable to Access	Unable to Locate	Foundation Damaged	Paved Over	Street Well	Saw Cut Needed	System Well	USA Marked Well	Comments
MW-1	12"	2																		OK
MW-3	12"	2	1																Y	
MW-2	12"	2																		OK

TRC

TRC SOLUTIONS

TECHNICAL SERVICES REQUEST FORM

26-Oct-11

Site ID:	6129	**Project No.:**	183487.0035.1639 / 00TA01
Address	3420 35th Ave.	**Client:**	Roya Kambin
City:	Oakland	**Contact #:**	925-790-6270
Cross Street:	Quigley St.	**PM:**	Ian Hull CRA
		PM Contact #:	510-420-3344

Total number of wells:	3	**Min. Well Diameter (in.):**	2	**# of Techs, # of Hrs:**	1, 3
Depth to Water (ft.):	28	**Max. Well Diameter (in.):**	2	**Travel Time (hrs):**	
		Max. Well Depth (ft):	44		

ACTIVITIES:		**Frequency**	**Notes**
Gauging:	☑	Semi Q2/Q4	
Purge/Sampling:	☑	Semi Q2/Q4	
No Purge/Sample	☐		

RELATED ACTIVITIES		**Notes**
Drums:	☑	
Other Activities:	☐	
Traffic Control:	☐	

PERMIT INFORMATION:

NOTIFICATIONS:

35th Ave. 76: 510-530-3550

SITE INFORMATION:

Coordinated event with Former Exxon Station 7-0234

Take field measurements pre-purge and after each casing volume purged.

TRC SOLUTIONS

TECHNICAL SERVICES REQUEST FORM

26-Oct-11

Site ID:	6129	**Project No.:**	183487.0035.1639 / 00TA01
Address	3420 35th Ave.	**Client:**	Roya Kambin
City:	Oakland	**Contact #:**	925-790-6270
Cross Street:	Quigley St.	**PM:**	Ian Hull CRA
		PM Contact #:	510-420-3344

LAB INFORMATION:

Global ID: T0600101465

Lab WO: 351639

Lab Used: BC Labs

Lab Notes: Lab analyses:
TPH-G by GC/MS, BTEX/MTBE/OXYS by 8260B, EDB/EDC by 8260B, Ethanol by 8260B [Containers: 3 voas w/HCl]

TRC SOLUTIONS

TECHNICAL SERVICES REQUEST FORM

26-Oct-11

Site ID.: 6129
Address 3420 35th Ave.
City: Oakland
Cross Street Quigley St.

			Gauging				Sampling				Field Measurements			
Well IDs	Benz.	MTBE	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Pre-Purge	Post-Purge	Type	Comments
MW-1	0	220	☐	☑	☐	☑	☐	☑	☐	☑	☑	☑	D.O., ORP	2" casing
MW-3	0	890	☐	☑	☐	☑	☐	☑	☐	☑	☑	☑	D.O., ORP	2" casing
MW-2	0	1100	☐	☑	☐	☑	☐	☑	☐	☑	☑	☑	D.O., ORP	2" casing

ATTACHMENT B

LABORATORY ANALYTICAL REPORT

BC Laboratories, Inc.
Environmental Testing Laboratory Since 1949

Date of Report: 12/06/2011

Jim Schneider

Conestoga-Rovers & Associates
5900 Hollis St. Suite A
Emeryville, CA 94608

Project:	6129
BC Work Order:	1119460
Invoice ID:	B112540

Enclosed are the results of analyses for samples received by the laboratory on 11/23/2011. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Molly Meyers

Contact Person: Molly Meyers
Client Service Rep

Authorized Signature

Table of Contents

CHAIN OF CUSTODY FORM

11-194160

Union Oil Company of California ■ 6101 Bollinger Canyon Road ■ San Ramon, CA 94583

COC 1 of 1

Union Oil Site ID: 6129	Union Oil Consultant: CRA
Site Global ID: T0600101465	Consultant Contact: Ian Hull
Site Address: 3420 35th Ave. Oakland, CA	Consultant Phone No.: 510 420 3344
Union Oil PM: Roya Kambin	Sampling Company: TRC
Union Oil PM Phone No.: 925 790 6270	Sampled By (PRINT): Andrew Vidovs
Charge Code: NWRTB-0 351639 -0- LAB	Sampler Signature:

This is a LEGAL document. ALL fields must be filled out CORRECTLY and COMPLETELY.

BC Laboratories, Inc.
Project Manager: Molly Meyers
4100 Atlas Court, Bakersfield, CA 93308
Phone No. 661-327-4911

Turnaround Time (TAT): Standard ☒ 24 Hours ☐ 48 Hours ☐ 72 Hours ☐

Special Instructions

SAMPLE ID						ANALYSES REQUIRED										
Field Point Name	Matrix	DTW	Date (yymmdd)	Sample Time	# of Containers	TPH - Diesel by EPA 8015	TPH - G by GC/MS	BTEX/MTBE/OXYS by EPA 8260B	Ethanol by EPA 8260B, EDB EDC by 8260B	EPA 8260B Full List with OXYS						Notes / Comments
MW-1	W-S-A	-1	111123	0614	3		X	X	X							
MW-3	W-S-A	-2	↓	0655	↓		↓	↓	↓							
MW-2	W-S-A	-3	↓	0723	↓		↓	↓	↓							
	W-S-A															
	W-S-A															
	W-S-A															
	W-S-A															
	W-S-A															
	W-S-A															
	W-S-A															
	W-S-A															
	W-S-A															

CHK BY: DKF
DISTRIBUTION
SUB-OUT ☐

Relinquished By	Company	Date / Time:	Relinquished By	Company	Date / Time:	Relinquished By	Company	Date / Time:
	TRC	11/23/11 0930	Gary Bogan	BC LABS	11-23-11 1710		BCL	11-23-11 2115
Received By	**Company**	**Date / Time:**	**Received By**	**Company**	**Date / Time:**	**Received By**	**Company**	**Date / Time:**
Gary Bogan	BC LABS	11-23-11 1110		BCL	11-23-11 ~~2115~~ 1710		BCL	11-23-11 2115

Chain of Custody and Cooler Receipt Form for 1119460 Page 2 of 2

BC LABORATORIES INC. SAMPLE RECEIPT FORM Rev. No. 12 06/24/08 Page 1 Of 1

Submission #: 11-19460

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☑ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☑ None ☐
Box ☐ Other ☐ (Specify)_____

Refrigerant: Ice ☑ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals: Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☑ Comments:

All samples received? Yes ☑ No ☐ All samples containers intact? Yes ☑ No ☐ Description(s) match COC? Yes ☑ No ☐

COC Received ☑ YES ☐ NO

Emissivity: 0.98 Container: 5A Thermometer ID: 177

Temperature: A 0.1 °C / C 0.1 °C

Date/Time 11-23-11 2105

Analyst Init JDW

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL PHYSICAL										
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL	A (3)	A (3)	A (3)	( )	( )	( )	( )	( )	( )	( )
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
100ml EPA 547										
100ml EPA 531.1										
QT EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										

Comments:

Sample Numbering Completed By: BLT Date/Time: 11-28-11@1300

A = Actual / C = Corrected

[H:\DOCS\WP80\LAB_DOCS\FORMS\SAMREC2.WPD]

Conestoga-Rovers & Associates
5900 Hollis St. Suite A
Emeryville, CA 94608

Reported: 12/06/2011 13:57
Project: 6129
Project Number: 351639
Project Manager: Jim Schneider

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information		
1119460-01	**COC Number:**	---	**Receive Date:** 11/23/2011 21:15
	Project Number:	6129	**Sampling Date:** 11/23/2011 06:14
	Sampling Location:	---	**Sample Depth:** ---
	Sampling Point:	MW-1-W-111123	**Lab Matrix:** Water
	Sampled By:	TRCI	**Sample Type:**
			Delivery Work Order:
			Global ID: T0600101465
			Location ID (FieldPoint): MW-1
			Matrix: W
			Sample QC Type (SACode): CS
			Cooler ID:
1119460-02	**COC Number:**	---	**Receive Date:** 11/23/2011 21:15
	Project Number:	6129	**Sampling Date:** 11/23/2011 06:55
	Sampling Location:	---	**Sample Depth:** ---
	Sampling Point:	MW-3-W-111123	**Lab Matrix:** Water
	Sampled By:	TRCI	**Sample Type:**
			Delivery Work Order:
			Global ID: T0600101465
			Location ID (FieldPoint): MW-3
			Matrix: W
			Sample QC Type (SACode): CS
			Cooler ID:
1119460-03	**COC Number:**	---	**Receive Date:** 11/23/2011 21:15
	Project Number:	6129	**Sampling Date:** 11/23/2011 07:23
	Sampling Location:	---	**Sample Depth:** ---
	Sampling Point:	MW-2-W-111123	**Lab Matrix:** Water
	Sampled By:	TRCI	**Sample Type:**
			Delivery Work Order:
			Global ID: T0600101465
			Location ID (FieldPoint): MW-2
			Matrix: W
			Sample QC Type (SACode): CS
			Cooler ID:

Conestoga-Rovers & Associates
5900 Hollis St. Suite A
Emeryville, CA 94608

Reported: 12/06/2011 13:57
Project: 6129
Project Number: 351639
Project Manager: Jim Schneider

Volatile Organic Analysis (EPA Method 8260)

BCL Sample ID: 1119460-01 | **Client Sample Name:** 6129, MW-1-W-111123, 11/23/2011 6:14:00AM

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	EPA-8260	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	EPA-8260	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	EPA-8260	ND		1
Ethylbenzene	ND	ug/L	0.50	EPA-8260	ND		1
Methyl t-butyl ether	**150**	**ug/L**	**2.5**	**EPA-8260**	ND	**A01**	2
Toluene	ND	ug/L	0.50	EPA-8260	ND		1
Total Xylenes	ND	ug/L	1.0	EPA-8260	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	EPA-8260	ND		1
t-Butyl alcohol	**41**	**ug/L**	**10**	**EPA-8260**	ND		1
Diisopropyl ether	ND	ug/L	0.50	EPA-8260	ND		1
Ethanol	ND	ug/L	250	EPA-8260	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	EPA-8260	ND		1
Total Purgeable Petroleum Hydrocarbons	**110**	**ug/L**	**50**	**Luft-GC/MS**	ND	**A90**	1
1,2-Dichloroethane-d4 (Surrogate)	101	%	76 - 114 (LCL - UCL)	EPA-8260			1
1,2-Dichloroethane-d4 (Surrogate)	96.3	%	76 - 114 (LCL - UCL)	EPA-8260			2
Toluene-d8 (Surrogate)	110	%	88 - 110 (LCL - UCL)	EPA-8260			1
Toluene-d8 (Surrogate)	103	%	88 - 110 (LCL - UCL)	EPA-8260			2
4-Bromofluorobenzene (Surrogate)	89.8	%	86 - 115 (LCL - UCL)	EPA-8260			1
4-Bromofluorobenzene (Surrogate)	92.4	%	86 - 115 (LCL - UCL)	EPA-8260			2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8260	12/02/11	12/02/11 18:40	JMC	MS-V12	1	BUL0240
2	EPA-8260	12/02/11	12/05/11 14:49	JMC	MS-V12	5	BUL0240

Conestoga-Rovers & Associates
5900 Hollis St. Suite A
Emeryville, CA 94608

Reported: 12/06/2011 13:57
Project: 6129
Project Number: 351639
Project Manager: Jim Schneider

Volatile Organic Analysis (EPA Method 8260)

BCL Sample ID: 1119460-02 | **Client Sample Name:** 6129, MW-3-W-111123, 11/23/2011 6:55:00AM

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	EPA-8260	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	EPA-8260	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	EPA-8260	ND		1
Ethylbenzene	ND	ug/L	0.50	EPA-8260	ND		1
Methyl t-butyl ether	**730**	**ug/L**	**10**	**EPA-8260**	ND	**A01**	2
Toluene	ND	ug/L	0.50	EPA-8260	ND		1
Total Xylenes	ND	ug/L	1.0	EPA-8260	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	EPA-8260	ND		1
t-Butyl alcohol	**170**	**ug/L**	**10**	**EPA-8260**	ND		1
Diisopropyl ether	ND	ug/L	0.50	EPA-8260	ND		1
Ethanol	ND	ug/L	250	EPA-8260	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	EPA-8260	ND		1
Total Purgeable Petroleum Hydrocarbons	**520**	**ug/L**	**50**	**Luft-GC/MS**	ND	**A90**	1
1,2-Dichloroethane-d4 (Surrogate)	97.0	%	76 - 114 (LCL - UCL)	EPA-8260			1
1,2-Dichloroethane-d4 (Surrogate)	92.2	%	76 - 114 (LCL - UCL)	EPA-8260			2
Toluene-d8 (Surrogate)	107	%	88 - 110 (LCL - UCL)	EPA-8260			1
Toluene-d8 (Surrogate)	105	%	88 - 110 (LCL - UCL)	EPA-8260			2
4-Bromofluorobenzene (Surrogate)	91.5	%	86 - 115 (LCL - UCL)	EPA-8260			1
4-Bromofluorobenzene (Surrogate)	96.1	%	86 - 115 (LCL - UCL)	EPA-8260			2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8260	12/02/11	12/02/11 18:22	JMC	MS-V12	1	BUL0240
2	EPA-8260	12/02/11	12/05/11 14:32	JMC	MS-V12	20	BUL0240

Conestoga-Rovers & Associates
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Reported: 12/06/2011 13:57
Project: 6129
Project Number: 351639
Project Manager: Jim Schneider

Volatile Organic Analysis (EPA Method 8260)

BCL Sample ID: 1119460-03 | **Client Sample Name:** 6129, MW-2-W-111123, 11/23/2011 7:23:00AM

Constituent	Result	Units	PQL	Method	MB Bias	Lab Quals	Run #
Benzene	ND	ug/L	0.50	EPA-8260	ND		1
1,2-Dibromoethane	ND	ug/L	0.50	EPA-8260	ND		1
1,2-Dichloroethane	ND	ug/L	0.50	EPA-8260	ND		1
Ethylbenzene	ND	ug/L	0.50	EPA-8260	ND		1
Methyl t-butyl ether	**1500**	**ug/L**	**12**	**EPA-8260**	ND	**A01**	2
Toluene	ND	ug/L	0.50	EPA-8260	ND		1
Total Xylenes	ND	ug/L	1.0	EPA-8260	ND		1
t-Amyl Methyl ether	ND	ug/L	0.50	EPA-8260	ND		1
t-Butyl alcohol	**400**	**ug/L**	**10**	**EPA-8260**	ND		1
Diisopropyl ether	**9.0**	**ug/L**	**0.50**	**EPA-8260**	ND		1
Ethanol	ND	ug/L	250	EPA-8260	ND		1
Ethyl t-butyl ether	ND	ug/L	0.50	EPA-8260	ND		1
Total Purgeable Petroleum Hydrocarbons	**830**	**ug/L**	**50**	**Luft-GC/MS**	ND		1
1,2-Dichloroethane-d4 (Surrogate)	97.1	%	76 - 114 (LCL - UCL)	EPA-8260			1
1,2-Dichloroethane-d4 (Surrogate)	94.3	%	76 - 114 (LCL - UCL)	EPA-8260			2
Toluene-d8 (Surrogate)	102	%	88 - 110 (LCL - UCL)	EPA-8260			1
Toluene-d8 (Surrogate)	103	%	88 - 110 (LCL - UCL)	EPA-8260			2
4-Bromofluorobenzene (Surrogate)	92.2	%	86 - 115 (LCL - UCL)	EPA-8260			1
4-Bromofluorobenzene (Surrogate)	96.1	%	86 - 115 (LCL - UCL)	EPA-8260			2

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-8260	12/02/11	12/02/11 18:04	JMC	MS-V12	1	BUL0240
2	EPA-8260	12/02/11	12/05/11 14:14	JMC	MS-V12	25	BUL0240

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Reported: 12/06/2011 13:57
Project: 6129
Project Number: 351639
Project Manager: Jim Schneider

Volatile Organic Analysis (EPA Method 8260)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BUL0240						
Benzene	BUL0240-BLK1	ND	ug/L	0.50		
1,2-Dibromoethane	BUL0240-BLK1	ND	ug/L	0.50		
1,2-Dichloroethane	BUL0240-BLK1	ND	ug/L	0.50		
Ethylbenzene	BUL0240-BLK1	ND	ug/L	0.50		
Methyl t-butyl ether	BUL0240-BLK1	ND	ug/L	0.50		
Toluene	BUL0240-BLK1	ND	ug/L	0.50		
Total Xylenes	BUL0240-BLK1	ND	ug/L	1.0		
t-Amyl Methyl ether	BUL0240-BLK1	ND	ug/L	0.50		
t-Butyl alcohol	BUL0240-BLK1	ND	ug/L	10		
Diisopropyl ether	BUL0240-BLK1	ND	ug/L	0.50		
Ethanol	BUL0240-BLK1	ND	ug/L	250		
Ethyl t-butyl ether	BUL0240-BLK1	ND	ug/L	0.50		
Total Purgeable Petroleum Hydrocarbons	BUL0240-BLK1	ND	ug/L	50		
1,2-Dichloroethane-d4 (Surrogate)	BUL0240-BLK1	103	%	76 - 114 (LCL - UCL)		
Toluene-d8 (Surrogate)	BUL0240-BLK1	107	%	88 - 110 (LCL - UCL)		
4-Bromofluorobenzene (Surrogate)	BUL0240-BLK1	88.8	%	86 - 115 (LCL - UCL)		

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Reported: 12/06/2011 13:57
Project: 6129
Project Number: 351639
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Volatile Organic Analysis (EPA Method 8260)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BUL0240										
Benzene	BUL0240-BS1	LCS	21.620	25.000	ug/L	86.5		70 - 130		
Toluene	BUL0240-BS1	LCS	22.810	25.000	ug/L	91.2		70 - 130		
1,2-Dichloroethane-d4 (Surrogate)	BUL0240-BS1	LCS	10.100	10.000	ug/L	101		76 - 114		
Toluene-d8 (Surrogate)	BUL0240-BS1	LCS	9.8700	10.000	ug/L	98.7		88 - 110		
4-Bromofluorobenzene (Surrogate)	BUL0240-BS1	LCS	10.770	10.000	ug/L	108		86 - 115		

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Reported: 12/06/2011 13:57
Project: 6129
Project Number: 351639
Project Manager: Jim Schneider

Volatile Organic Analysis (EPA Method 8260)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BUL0240	Used client sample: N										
Benzene	MS	1119701-08	ND	21.290	25.000	ug/L		85.2		70 - 130	
	MSD	1119701-08	ND	18.970	25.000	ug/L	11.5	75.9	20	70 - 130	
Toluene	MS	1119701-08	ND	22.340	25.000	ug/L		89.4		70 - 130	
	MSD	1119701-08	ND	20.740	25.000	ug/L	7.4	83.0	20	70 - 130	
1,2-Dichloroethane-d4 (Surrogate)	MS	1119701-08	ND	9.9000	10.000	ug/L		99.0		76 - 114	
	MSD	1119701-08	ND	9.7400	10.000	ug/L	1.6	97.4		76 - 114	
Toluene-d8 (Surrogate)	MS	1119701-08	ND	9.7800	10.000	ug/L		97.8		88 - 110	
	MSD	1119701-08	ND	9.8700	10.000	ug/L	0.9	98.7		88 - 110	
4-Bromofluorobenzene (Surrogate)	MS	1119701-08	ND	10.690	10.000	ug/L		107		86 - 115	
	MSD	1119701-08	ND	10.440	10.000	ug/L	2.4	104		86 - 115	

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Notes And Definitions

MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A90	TPPH does not exhibit a "gasoline" pattern. TPPH is entirely due to MTBE.

ATTACHMENT C

HISTORICAL GROUNDWATER MONITORING AND SAMPLING DATA

Table 2
HISTORICT FLUID LEVELS AND SELECTED ANALYTICAL RESULTS

November 1, 2010
76 Station 6129

Date Sampled	TOC Elevation (feet)	Depth to Water (feet)	LPH Thickness (feet)	Ground-Water Elevation (feet)	Change in Elevation (feet)	TPH-G 8015 ()	TPH-G (GC/MS) (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	MTBE (8021B) (µg/l)	MTBE (8260B) (µg/l)	Comments
MW-1														
1/5/1990	--	--	--	--	--	ND	--	ND	ND	ND	ND	--		
5/11/1990	--	--	--	--	--	ND	--	ND	7.1	ND	ND	--		
8/9/1990	--	--	--	--	--	ND	--	ND	ND	ND	ND	--		
11/14/1990	--	--	--	--	--	ND	--	ND	ND	ND	ND	--		
2/12/1991	--	--	--	--	--	ND	--	0.32	ND	ND	ND	--		
5/9/1991	--	--	--	--	--	ND	--	ND	ND	ND	ND	--		
11/13/2003	--	--	--	--	--	--	180	ND<1.0	ND<1.0	ND<1.0	ND<2.0	--	240	
8/27/2004	102.24	30.65	0	71.59	--	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
11/23/2004	102.24	29.35	0	72.89	1.30	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
2/9/2005	102.24	26.89	0	75.35	2.46	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	9.3	
5/17/2005	102.24	26.56	0	75.68	0.33	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	1.9	
7/27/2005	102.24	27.33	0	74.91	-0.77	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	ND<0.50	
12/6/2005	102.24	29.59	0	72.65	-2.26	--	ND<50	ND<0.50	0.93	ND<0.50	1.8	--	ND<0.50	
2/21/2006	102.24	28.27	0	73.97	1.32	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	2.6	
6/8/2006	102.24	26.07	0	76.17	2.20	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	11	
9/15/2006	102.24	28.86	0	73.38	-2.79	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	1.4	
12/14/2006	102.24	29.49	0	72.75	-0.63	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	3.5	
3/28/2007	102.24	27.24	0	75.00	2.25	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	0.64	
6/25/2007	102.24	28.30	0	73.94	-1.06	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	ND<0.50	
9/22/2007	102.24	30.61	0	71.63	-2.31	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	4.1	
12/14/2007	102.24	30.30	0	71.94	0.31	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	0.65	
3/17/2008	102.24	27.22	0	75.02	3.08	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	14	
6/20/2008	102.24	30.10	0	72.14	-2.88	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	11	
9/11/2008	102.24	31.04	0	71.20	-0.94	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	1.3	
11/25/2008	102.24	30.88	0	71.36	0.16	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	5.8	
3/9/2009	102.24	27.50	0	74.74	3.38	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	25	
5/28/2009	102.24	28.25	0	73.99	-0.75	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	17	
12/11/2009	190.79	30.60	0	160.19	86.20	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	18	
5/7/2010	190.79	26.06	0	164.73	4.54	--	67	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	64	
11/1/2010	190.79	30.18	0	160.61	-4.12	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	92	
MW-2														
1/5/1990	--	--	--	--	--	ND	--	ND	ND	ND	ND	--		
5/11/1990	--	--	--	--	--	ND	--	ND	ND	ND	ND	--		
8/9/1990	--	--	--	--	--	ND	--	ND	ND	ND	ND	--		

Table 2
HISTORICT FLUID LEVELS AND SELECTED ANALYTICAL RESULTS

November 1, 2010

11/14/1990	--	--	--	--	--	ND	--	ND	ND	ND	ND	--	
2/12/1991	--	--	--	--	--	ND	--	ND	0.42	ND	0.51	--	
5/9/1991	--	--	--	--	--	ND	--	ND	ND	ND	ND	--	
11/13/2003	--	--	--	--	--	--	ND<2000	ND<20	ND<20	ND<20	ND<40	--	2100
8/27/2004	102.16	30.28	0	71.88	--	--	950	ND<5.0	ND<5.0	ND<5.0	ND<10	--	1400
11/23/2004	102.16	28.75	0	73.41	1.53	--	53	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	4.2
2/9/2005	102.16	26.08	0	76.08	2.67	--	ND<500	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	400
5/17/2005	102.16	24.53	0	77.63	1.55	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	330
7/27/2005	102.16	27.51	0	74.65	-2.98	--	ND<500	ND<5.0	ND<5.0	ND<5.0	ND<10	--	580
12/6/2005	102.16	29.13	0	73.03	-1.62	--	340	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	780
2/21/2006	102.16	29.23	0	72.93	-0.10	--	190	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	340
6/8/2006	102.16	25.76	0	76.40	3.47	--	ND<500	ND<5.0	ND<5.0	ND<5.0	ND<10	--	440
9/15/2006	102.16	29.17	0	72.99	-3.41	--	ND<500	ND<5.0	ND<5.0	ND<5.0	ND<5.0	--	570
12/14/2006	102.16	29.11	0	73.05	0.06	--	520	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	770
3/28/2007	102.16	26.68	0	75.48	2.43	--	290	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	460
6/25/2007	102.16	25.91	0	76.25	0.77	--	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	1.2
9/22/2007	102.16	30.18	0	71.98	-4.27	--	400	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	530
12/14/2007	102.16	29.96	0	72.20	0.22	--	400	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	930
3/17/2008	102.16	26.74	0	75.42	3.22	--	570	ND<5.0	ND<5.0	ND<5.0	ND<10	--	630
6/20/2008	102.16	29.78	0	72.38	-3.04	--	580	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	1200
9/11/2008	102.16	30.62	0	71.54	-0.84	--	220	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	29
11/25/2008	102.16	30.48	0	71.68	0.14	--	500	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	1500
3/9/2009	102.16	25.75	0	76.41	4.73	--	910	ND<5.0	ND<5.0	ND<5.0	ND<10	--	1400
5/28/2009	102.16	27.71	0	74.45	-1.96	--	460	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	740
12/11/2009	190.80	29.80	0	161.00	86.55	--	640	ND<5.0	ND<5.0	ND<5.0	ND<10	--	1300
5/7/2010	190.80	25.11	0	165.69	4.69	--	600	ND<1.0	ND<1.0	ND<1.0	ND<2.0	--	940
11/1/2010	190.80	29.90	0	160.90	-4.79	--	140	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	730
MW-3													
1/5/1990	--	--	0	--	--	ND	--	ND	ND	ND	ND	--	
5/11/1990	--	--	--	--	--	ND	--	ND	ND	ND	ND	--	
8/9/1990	--	--	--	--	--	ND	--	ND	ND	ND	ND	--	
11/14/1990	--	--	--	--	--	ND	--	ND	ND	ND	ND	--	
2/12/1991	--	--	--	--	--	ND	--	ND	ND	ND	ND	--	
5/9/1991	--	--	--	--	--	ND	--	ND	ND	ND	ND	--	
11/13/2003	--	--	--	--	--	--	2600	ND<20	ND<20	ND<20	ND<40	--	3700
8/27/2004	100.00	29.61	0	70.39	--	--	1700	ND<10	ND<10	ND<10	ND<20	--	2600
11/23/2004	100.00	28.48	0	71.52	1.13	--	1500	ND<10	ND<10	ND<10	ND<20	--	1800
2/9/2005	100.00	26.45	0	73.55	2.03	--	ND<1000	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	2100
5/17/2005	100.00	25.61	0	74.39	0.84	--	ND<1000	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	1200
7/27/2005	100.00	27.35	0	72.65	-1.74	--	ND<1000	ND<10	ND<10	ND<10	ND<20	--	1400
12/6/2005	100.00	28.78	0	71.22	-1.43	--	430	ND<0.50	1.6	ND<0.50	3.6	--	1800

Table 2
HISTORICT FLUID LEVELS AND SELECTED ANALYTICAL RESULTS

November 1, 2010

2/21/2006	100.00	28.91	0	71.09	-0.13	--	420	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	1100
6/8/2006	100.00	25.97	0	74.03	2.94	--	ND<1200	ND<12	ND<12	ND<12	ND<25	--	1000
9/15/2006	100.00	28.73	0	71.27	-2.76	--	ND<1200	ND<12	ND<12	ND<12	ND<12	--	1200
12/14/2006	100.00	28.62	0	71.38	0.11	--	ND<1000	ND<10	ND<10	ND<10	ND<10	--	1300
3/28/2007	100.00	26.69	0	73.31	1.93	--	500	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	860
6/25/2007	100.00	26.74	0	73.26	-0.05	--	270	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	570
9/22/2007	100.00	29.57	0	70.43	-2.83	--	500	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	980
12/14/2007	100.00	29.30	0	70.70	0.27	--	270	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	570
3/17/2008	100.00	26.82	0	73.18	2.48	--	220	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	520
6/20/2008	100.00	29.10	0	70.90	-2.28	--	490	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	1300
9/11/2008	100.00	29.89	0	70.11	-0.79	--	630	ND<5.0	ND<5.0	ND<5.0	ND<10	--	1200
11/25/2008	100.00	29.74	0	70.26	0.15	--	380	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	870
3/9/2009	100.00	25.56	0	74.44	4.18	--	310	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	720
5/28/2009	100.00	27.55	0	72.45	-1.99	--	410	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	750
12/11/2009	188.58	29.10	0	159.48	87.03	--	220	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	620
5/7/2010	188.58	25.72	0	162.86	3.38	--	360	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	660
11/1/2010	188.58	29.29	0	159.29	-3.57	--	120	ND<0.50	ND<0.50	ND<0.50	ND<1.0	--	490

Table 2a
ADDITIONAL HISTORIC ANALYTICAL RESULTS

76 Station 6129

Date Sampled	TBA (µg/l)	Ethanol (8260B) (µg/l)	Ethylene-dibromide (EDB) (µg/l)	1,2-DCA (EDC) (µg/l)	DIPE (µg/l)	ETBE (µg/l)	TAME (µg/l)	Carbon (organic, total) (mg/l)	Chromium VI (µg/l)	Chromium (total) (µg/l)	Chromium (dissolved) ()	Iron Ferric (µg/l)	Comments
MW-1													
11/13/2003	ND<200	ND<1000	ND<4.0	ND<4.0	ND<4.0	ND<4.0	ND<4.0	--	--	--	--	--	
8/27/2004	ND<5.0	ND<50	ND<0.50	ND<0.50	ND<1.0	ND<0.50	ND<0.50	--	--	--	--	--	
11/23/2004	ND<5.0	ND<50	ND<0.50	ND<0.50	ND<1.0	ND<0.50	ND<0.50	--	--	--	--	--	
2/9/2005	ND<5.0	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
5/17/2005	ND<5.0	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
7/27/2005	ND<5.0	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
12/6/2005	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
2/21/2006	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
6/8/2006	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
9/15/2006	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
12/14/2006	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
3/28/2007	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
6/25/2007	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
9/22/2007	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
12/14/2007	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
3/17/2008	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
6/20/2008	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
9/11/2008	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
11/25/2008	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
3/9/2009	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	0.83	--	--	--	--	
5/28/2009	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	0.88	ND<2.0	21	ND<10	27000	
12/11/2009	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
5/7/2010	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
11/1/2010	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--	
MW-2													
11/13/2003	ND<4000	ND<20000	ND<80	ND<80	ND<80	ND<80	ND<80	--	--	--	--	--	
8/27/2004	ND<50	ND<500	ND<5.0	ND<5.0	24	ND<5.0	ND<5.0	--	--	--	--	--	
11/23/2004	ND<5.0	ND<50	ND<0.50	ND<0.50	18	ND<0.50	ND<0.50	--	--	--	--	--	
2/9/2005	ND<50	ND<500	ND<5.0	ND<5.0	19	ND<5.0	ND<5.0	--	--	--	--	--	
5/17/2005	ND<5.0	ND<50	ND<0.50	ND<0.50	12	ND<0.50	ND<0.50	--	--	--	--	--	
7/27/2005	140	ND<500	ND<5.0	ND<5.0	16	ND<5.0	ND<5.0	--	--	--	--	--	
12/6/2005	61	ND<250	ND<0.50	ND<0.50	15	ND<0.50	ND<0.50	--	--	--	--	--	
2/21/2006	ND<10	ND<250	ND<0.50	ND<0.50	18	ND<0.50	ND<0.50	--	--	--	--	--	
6/8/2006	ND<100	ND<2500	ND<5.0	ND<5.0	14	ND<5.0	ND<5.0	--	--	--	--	--	
9/15/2006	ND<100	ND<2500	ND<5.0	ND<5.0	17	ND<5.0	ND<5.0	--	--	--	--	--	

Table 2a
ADDITIONAL HISTORIC ANALYTICAL RESULTS

12/14/2006	27	ND<250	ND<0.50	ND<0.50	20	ND<0.50	ND<0.50	--	--	--	--	--
3/28/2007	260	ND<250	ND<0.50	ND<0.50	23	ND<0.50	ND<0.50	--	--	--	--	--
6/25/2007	ND<10	ND<250	ND<0.50	ND<0.50	23	ND<0.50	ND<0.50	--	--	--	--	--
9/22/2007	ND<10	ND<250	ND<0.50	ND<0.50	35	ND<0.50	ND<0.50	--	--	--	--	--
12/14/2007	48	ND<250	ND<0.50	ND<0.50	24	ND<0.50	ND<0.50	--	--	--	--	--
3/17/2008	ND<100	ND<2500	ND<5.0	ND<5.0	18	ND<5.0	ND<5.0	--	--	--	--	--
6/20/2008	ND<10	ND<250	ND<0.50	ND<0.50	16	ND<0.50	ND<0.50	--	--	--	--	--
9/11/2008	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--
11/25/2008	ND<10	ND<250	ND<0.50	ND<0.50	19	ND<0.50	ND<0.50	--	--	--	--	--
3/9/2009	ND<100	ND<2500	ND<5.0	ND<5.0	15	ND<5.0	ND<5.0	1.4	--	--	--	--
5/28/2009	ND<10	ND<250	ND<0.50	ND<0.50	20	ND<0.50	ND<0.50	1.6	ND<2.0	49	ND<10	43000
12/11/2009	ND<100	ND<2500	ND<5.0	ND<5.0	19	ND<5.0	ND<5.0	--	--	--	--	--
5/7/2010	ND<20	ND<500	ND<1.0	ND<1.0	14	ND<1.0	ND<1.0	--	--	--	--	--
11/1/2010	ND<10	ND<250	ND<0.50	ND<0.50	28	ND<0.50	ND<0.50	--	--	--	--	--
MW-3												
11/13/2003	ND<4000	ND<20000	ND<80	ND<80	ND<80	ND<80	ND<80	--	--	--	--	--
8/27/2004	ND<100	ND<1000	ND<10	ND<10	ND<20	ND<10	ND<10	--	--	--	--	--
11/23/2004	ND<100	ND<1000	ND<10	ND<10	ND<20	ND<10	ND<10	--	--	--	--	--
2/9/2005	130	ND<1000	ND<10	ND<10	ND<10	ND<10	ND<10	--	--	--	--	--
5/17/2005	ND<100	ND<1000	ND<10	ND<10	ND<10	ND<10	ND<10	--	--	--	--	--
7/27/2005	360	ND<1000	ND<10	ND<10	ND<10	ND<10	ND<10	--	--	--	--	--
12/6/2005	160	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--
2/21/2006	88	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	0.58	--	--	--	--	--
6/8/2006	ND<250	ND<6200	ND<12	ND<12	ND<12	ND<12	ND<12	--	--	--	--	--
9/15/2006	ND<250	ND<6200	ND<12	ND<12	ND<12	ND<12	ND<12	--	--	--	--	--
12/14/2006	ND<200	ND<5000	ND<10	ND<10	ND<10	ND<10	ND<10	--	--	--	--	--
3/28/2007	500	ND<500	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	--	--	--	--
6/25/2007	11	ND<250	ND<0.50	0.65	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--
9/22/2007	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--
12/14/2007	26	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--
3/17/2008	ND<10	ND<250	ND<0.50	0.65	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--
6/20/2008	49	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--
9/11/2008	ND<100	ND<2500	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	--	--	--	--	--
11/25/2008	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--
3/9/2009	15	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.4	--	--	--	--
5/28/2009	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.5	ND<2.0	23	ND<10	11000
12/11/2009	63	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--
5/7/2010	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--
11/1/2010	ND<10	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	--	--	--	--	--

Table 2b
ADDITIONAL HISTORIC ANALYTICAL RESULTS

76 Station 6129

Date Sampled	Iron Ferrous (µg/l)	Iron (total) (µg/l)	Manganese (dissolved) (µg/l)	Manganese (total) (µg/l)	Nitrogen as Nitrate (mg/l)	Sulfate (mg/l)	Alkalinity (total) (mg/l)	Dissolved Oxygen (Lab) (mg O/)	Redox Potential (ORP-Lab) (mV)	Specific Con-ductance (umhos)	Post-purge Dissolved Oxygen ()	Pre-purge Dissolved Oxygen ()	Comments
MW-1													
11/13/2003	--	--	--	--	--	--	--	--	--	--	--	--	
8/27/2004	--	--	--	--	--	--	--	--	--	--	--	--	
11/23/2004	--	--	--	--	--	--	--	--	--	--	--	--	
2/9/2005	--	--	--	--	--	--	--	--	--	--	--	--	
5/17/2005	--	--	--	--	--	--	--	--	--	--	--	--	
7/27/2005	--	--	--	--	--	--	--	--	--	--	--	--	
12/6/2005	--	--	--	--	--	--	--	--	--	--	--	--	
2/21/2006	--	--	--	--	--	--	--	--	--	--	--	--	
6/8/2006	--	--	--	--	--	--	--	--	--	--	--	--	
9/15/2006	--	--	--	--	--	--	--	--	--	--	--	--	
12/14/2006	--	--	--	--	--	--	--	--	--	--	--	--	
3/28/2007	--	--	--	--	--	--	--	--	--	--	--	--	
6/25/2007	--	--	--	--	--	--	--	--	--	--	--	--	
9/22/2007	--	--	--	--	--	--	--	--	--	--	--	--	
12/14/2007	--	--	--	--	--	--	--	--	--	--	--	--	
3/17/2008	--	--	--	--	--	--	--	--	--	--	--	--	
6/20/2008	--	--	--	--	--	--	--	--	--	--	--	--	
9/11/2008	--	--	--	--	--	--	--	--	--	--	--	--	
11/25/2008	--	--	--	--	--	--	--	--	--	--	--	--	
3/9/2009	ND<1000	--	--	--	2.0	46	310	--	--	--	1.95	2.54	
5/28/2009	ND<500	27000	10	680	2.9	43	310	7.7	126	798	--	4.05	
12/11/2009	--	--	--	--	--	--	--	--	--	--	1.42	2.35	
5/7/2010	--	--	--	--	--	--	--	--	--	--	2.60	3.06	
11/1/2010	--	--	--	--	--	--	--	--	--	--	0.54	2.30	
MW-2													
11/13/2003	--	--	--	--	--	--	--	--	--	--	--	--	
8/27/2004	--	--	--	--	--	--	--	--	--	--	--	--	
11/23/2004	--	--	--	--	--	--	--	--	--	--	--	--	
2/9/2005	--	--	--	--	--	--	--	--	--	--	--	--	
5/17/2005	--	--	--	--	--	--	--	--	--	--	--	--	
7/27/2005	--	--	--	--	--	--	--	--	--	--	--	--	
12/6/2005	--	--	--	--	--	--	--	--	--	--	--	--	
2/21/2006	--	--	--	--	--	--	--	--	--	--	--	--	
6/8/2006	--	--	--	--	--	--	--	--	--	--	--	--	
9/15/2006	--	--	--	--	--	--	--	--	--	--	--	--	

Table 2b
ADDITIONAL HISTORIC ANALYTICAL RESULTS

12/14/2006	--	--	--	--	--	--	--	--	--	--	--	--
3/28/2007	--	--	--	--	--	--	--	--	--	--	--	--
6/25/2007	--	--	--	--	--	--	--	--	--	--	--	--
9/22/2007	--	--	--	--	--	--	--	--	--	--	--	--
12/14/2007	--	--	--	--	--	--	--	--	--	--	--	--
3/17/2008	--	--	--	--	--	--	--	--	--	--	--	--
6/20/2008	--	--	--	--	--	--	--	--	--	--	--	--
9/11/2008	--	--	--	--	--	--	--	--	--	--	--	--
11/25/2008	--	--	--	--	--	--	--	--	--	--	--	--
3/9/2009	940	--	--	--	2.0	41	410	--	--	--	0.85	1.32
5/28/2009	ND<1000	44000	4.3	500	1.6	40	370	7.1	138	813	--	1.54
12/11/2009	--	--	--	--	--	--	--	--	--	--	0.47	0.74
5/7/2010	--	--	--	--	--	--	--	--	--	--	1.89	2.39
11/1/2010	--	--	--	--	--	--	--	--	--	--	1.12	1.22
MW-3												
11/13/2003	--	--	--	--	--	--	--	--	--	--	--	--
8/27/2004	--	--	--	--	--	--	--	--	--	--	--	--
11/23/2004	--	--	--	--	--	--	--	--	--	--	--	--
2/9/2005	--	--	--	--	--	--	--	--	--	--	--	--
5/17/2005	--	--	--	--	--	--	--	--	--	--	--	--
7/27/2005	--	--	--	--	--	--	--	--	--	--	--	--
12/6/2005	--	--	--	--	--	--	--	--	--	--	--	--
2/21/2006	--	--	--	--	--	--	--	--	--	--	--	--
6/8/2006	--	--	--	--	--	--	--	--	--	--	--	--
9/15/2006	--	--	--	--	--	--	--	--	--	--	--	--
12/14/2006	--	--	--	--	--	--	--	--	--	--	--	--
3/28/2007	--	--	--	--	--	--	--	--	--	--	--	--
6/25/2007	--	--	--	--	--	--	--	--	--	--	--	--
9/22/2007	--	--	--	--	--	--	--	--	--	--	--	--
12/14/2007	--	--	--	--	--	--	--	--	--	--	--	--
3/17/2008	--	--	--	--	--	--	--	--	--	--	--	--
6/20/2008	--	--	--	--	--	--	--	--	--	--	--	--
9/11/2008	--	--	--	--	--	--	--	--	--	--	--	--
11/25/2008	--	--	--	--	--	--	--	--	--	--	--	--
3/9/2009	ND<500	--	--	--	ND<0.44	38	310	--	--	--	0.94	0.84
5/28/2009	ND<500	12000	49	300	ND<0.44	39	300	7.5	125	667	--	0.91
12/11/2009	--	--	--	--	--	--	--	--	--	--	0.75	1.03
5/7/2010	--	--	--	--	--	--	--	--	--	--	2.35	2.29
11/1/2010	--	--	--	--	--	--	--	--	--	--	0.98	1.22

Table 2c
ADDITIONAL HISTORIC ANALYTICAL RESULTS

76 Station 6129

Date Sampled	Pre-purge ORP ()	Post-purge ORP ()	Comments
MW-1			
11/13/2003	--	--	
8/27/2004	--	--	
11/23/2004	--	--	
2/9/2005	--	--	
5/17/2005	--	--	
7/27/2005	--	--	
12/6/2005	--	--	
2/21/2006	--	--	
6/8/2006	--	--	
9/15/2006	--	--	
12/14/2006	--	--	
3/28/2007	--	--	
6/25/2007	--	--	
9/22/2007	--	--	
12/14/2007	--	--	
3/17/2008	--	--	
6/20/2008	--	--	
9/11/2008	--	--	
11/25/2008	--	--	
3/9/2009	8	24	
5/28/2009	70	--	
12/11/2009	32	21	
5/7/2010	211	205	
11/1/2010	150	163	
MW-2			
11/13/2003	--	--	
8/27/2004	--	--	
11/23/2004	--	--	
2/9/2005	--	--	
5/17/2005	--	--	
7/27/2005	--	--	
12/6/2005	--	--	
2/21/2006	--	--	
6/8/2006	--	--	
9/15/2006	--	--	

Table 2c
ADDITIONAL HISTORIC ANALYTICAL RESULTS

12/14/2006	--	--
3/28/2007	--	--
6/25/2007	--	--
9/22/2007	--	--
12/14/2007	--	--
3/17/2008	--	--
6/20/2008	--	--
9/11/2008	--	--
11/25/2008	--	--
3/9/2009	39	56
5/28/2009	80	--
12/11/2009	29	-10
5/7/2010	208	204
11/1/2010	96	158
MW-3		
11/13/2003	--	--
8/27/2004	--	--
11/23/2004	--	--
2/9/2005	--	--
5/17/2005	--	--
7/27/2005	--	--
12/6/2005	--	--
2/21/2006	--	--
6/8/2006	--	--
9/15/2006	--	--
12/14/2006	--	--
3/28/2007	--	--
6/25/2007	--	--
9/22/2007	--	--
12/14/2007	--	--
3/17/2008	--	--
6/20/2008	--	--
9/11/2008	--	--
11/25/2008	--	--
3/9/2009	14	32
5/28/2009	66	--
12/11/2009	44	35
5/7/2010	209	204
11/1/2010	142	148

ATTACHMENT D

EXXON GROUNDWATER MONITORING AND SAMPLING DATA

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Former Exxon Service Station 70234
3450 35th Avenue
Oakland, California

Well ID	Sampling Date	Depth (feet)	TOC Elev. (feet)	DTW (feet)	GW Elev. (feet)	NAPL (feet)	TPHg (µg/L)	MTBE (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	Total Pb (µg/L)	Organic Pb (mg/L)
Monitoring Well Samples														
MW1	07/15/92	---	---	Well installed.										
MW1	07/17/92	---	192.00	33.02	158.98	No	67	---	6.6	6.9	2.0	4.5	17	---
MW1	10/22/92	---	192.00	34.07	157.93	No	<50	---	2.9	<0.5	<0.5	<0.5	16	---
MW1	02/04/93	---	192.00	29.43	162.57	No	<50	---	0.8	<0.5	<0.5	<0.5	4	---
MW1	05/03/93	---	192.00	29.72	162.28	No	71	---	2.8	7.2	2.2	22	40	---
MW1	07/30/93	---	192.00	32.95	159.05	No	<50	---	<0.5	<0.5	<0.5	<0.5	5	---
MW1	10/19/93	---	192.00	34.34	157.66	No	<50	---	<0.5	<0.5	<0.5	<0.5	12	---
MW1	02/23/94	---	192.00	31.72	160.28	No	<50	---	<0.5	<0.5	<0.5	<0.5	4	---
MW1	06/06/94	---	192.00	31.77	160.23	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3	---
MW1	08/18/94	---	192.00	33.76	158.24	No	<50	---	<0.5	<0.5	<0.5	<0.5	130	---
MW1	11/15/94	---	192.00	34.08	157.92	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3.0	<100
MW1	02/06/95	---	192.00	28.50	163.50	No	<50	---	<0.5	<0.5	<0.5	<0.5	---	---
MW1	05/10/95	---	192.00	29.30	162.70	No	<50	---	<0.5	<0.5	<0.5	<0.5	---	---
MW1	09/20/99	---	192.00	33.30	158.70	No	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<75	<50
MW1	Well destroyed in June 2000.													
MW2	07/15/92	---	---	Well installed.										
MW2	07/17/92	---	194.85	34.65	160.20	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3	---
MW2	10/22/92	---	194.85	35.64	159.21	No	<50	---	<0.5	<0.5	<0.5	<0.5	--	---
MW2	02/04/93	---	194.85	31.13	163.72	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3	---
MW2	05/03/93	---	194.85	31.08	163.77	No	<50	---	<0.5	<0.5	<0.5	<0.5	3	---
MW2	07/30/93	---	194.85	34.34	160.51	No	<50	---	<0.5	<0.5	<0.5	<0.5	14	---
MW2	10/19/93	---	194.85	36.00	158.85	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3	---
MW2	02/23/94	---	194.85	33.92	160.93	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3	---
MW2	06/06/94	---	194.85	33.50	161.35	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3	---
MW2	08/18/94	---	194.85	35.38	159.47	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3.0	---
MW2	11/15/94	---	194.85	35.93	158.92	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3.0	<100
MW2	02/06/95	---	194.85	30.38	164.47	No	<50	---	<0.5	<0.5	<0.5	<0.5	---	---
MW2	05/10/95	---	194.85	30.77	164.08	No	<50	---	<0.5	<0.5	<0.5	<0.5	---	---
MW2	09/20/99	---	194.85	35.15	159.70	No	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<75	<0.5
MW2	Well destroyed in June 2000.													
MW3	07/15/92	---	---	Well installed.										
MW3	07/17/92	---	196.90	37.24	159.66	No	<50	---	<0.5	<0.5	<0.5	<0.5	50	---

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Former Exxon Service Station 70234
3450 35th Avenue
Oakland, California

Well ID	Sampling Date	Depth (feet)	TOC Elev. (feet)	DTW (feet)	GW Elev. (feet)	NAPL (feet)	TPHg (µg/L)	MTBE (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	Total Pb (µg/L)	Organic Pb (mg/L)
MW3	10/22/92	---	196.90	35.95	160.95	No	<50	---	<0.5	<0.5	<0.5	<0.5	9	---
MW3	02/04/93	---	196.90	29.85	167.05	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3	---
MW3	05/03/93	---	196.90	29.87	167.03	No	<50	---	<0.5	<0.5	<0.5	<0.5	3	---
MW3	07/30/93	---	196.90	33.85	163.05	No	<50	---	<0.5	<0.5	<0.5	<0.5	22	---
MW3	10/19/93	---	196.90	35.89	161.01	No	<50	---	<0.5	<0.5	<0.5	<0.5	12	---
MW3	02/23/94	---	196.90	32.88	164.02	No	<50	---	<0.5	<0.5	<0.5	<0.5	25	---
MW3	06/06/94	---	196.90	32.40	164.50	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3	---
MW3	08/18/94	---	196.90	35.07	161.83	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3.0	---
MW3	11/15/94	---	196.90	35.97	160.93	No	<50	---	<0.5	<0.5	<0.5	<0.5	<3.0	<100
MW3	02/06/95	---	196.90	28.39	168.51	No	<50	---	<0.5	<0.5	<0.5	<0.5	---	---
MW3	05/10/95	---	196.90	28.90	168.00	No	<50	---	<0.5	<0.5	<0.5	<0.5	---	---
MW3	09/20/99	---	196.90	34.68	162.22	No	75.0	1.87	<0.5	11.5	1.8	18.0	<75	<0.5
MW3	Well destroyed in June 2000.													
MW4	03/02/09	---	---	Well installed.										
MW4	03/30/09	---	197.62	30.94	166.68	No	<50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---
MW4	04/02/09	---	197.62	Well surveyed.										
MW4	05/28/09	---	197.62	32.00	165.62	No	<50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---
MW4	08/31/09	---	197.62	35.43	162.19	No	<50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---
MW4	12/11/09	---	197.62	35.01	162.61	No	<50	<0.50	<0.50	0.83	<0.50	1.1	---	---
MW4	05/07/10	---	197.62	29.11	168.51	No	<50	<0.50	<0.50	<0.50	<0.50	<1.0	---	---
MW4	11/01/10	---	197.62	34.95	162.67	No	<50	<0.50	<0.50	<0.50	<0.50	<1.0	---	---
MW4	05/27/11 d	---	197.62	30.65	166.97	No	---	---	---	---	---	---	---	---
MW4	**11/23/11**	**---**	**197.62**	**33.49**	**164.13**	**No**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**---**	**---**
MW5	03/06/09	---	---	Well installed.										
MW5	03/30/09	---	196.35	30.05	166.30	No	4,200	1,900	540	140	<12	310	---	---
MW5	04/02/09	---	196.35	Well surveyed.										
MW5	05/28/09	---	196.35	31.45	164.90	No	5,300	3,600	890	150	<25	140	---	---
MW5	08/31/09	---	196.35	34.70	161.65	No	5,800	3,500	550	<100	<100	<100	---	---
MW5	12/11/09	---	196.35	34.52	161.83	No	4,000b	3,800	230	<100	<100	<100	---	---
MW5	05/07/10	---	196.35	30.84	165.51	No	2,700b	1,700	73	5.3	3.6	6.5	---	---
MW5	11/01/10	---	196.35	33.93	162.42	No	2,400b	3,400	320	71	21	40	---	---
MW5	05/27/11 d	---	196.35	31.65	164.70	No	---	---	---	---	---	---	---	---
MW5	**11/23/11**	**---**	**196.35**	**32.58**	**163.77**	**No**	**1,900b**	**3,200**	**72**	**2.7**	**3.1**	**8.1**	**---**	**---**
MW6	03/09/09	---	---	Well installed.										

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Former Exxon Service Station 70234
3450 35th Avenue
Oakland, California

Well ID	Sampling Date	Depth (feet)	TOC Elev. (feet)	DTW (feet)	GW Elev. (feet)	NAPL (feet)	TPHg (µg/L)	MTBE (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	Total Pb (µg/L)	Organic Pb (mg/L)
MW6	03/30/09	---	192.41	26.94	165.47	No	2,800	4,800	0.91	<0.50	<0.50	<0.50	---	---
MW6	04/02/09	---	192.41	Well surveyed.										
MW6	05/28/09	---	192.41	28.04	164.37	No	2,800	6,000	<100	<100	<100	<100	---	---
MW6	08/31/09	---	192.41	30.57	161.84	No	4,900	6,600	<100	<100	<100	<100	---	---
MW6	12/11/09	---	192.41	30.78	161.63	No	4,900b	6,200	<100	<100	<100	<100	---	---
MW6	05/07/10	---	192.41	25.42	166.99	No	2,900b	3,700	2.7	<0.50	0.74c	<1.0	---	---
MW6	11/01/10	---	192.41	30.68	161.73	No	850b	6,100	2.1	<0.50	<0.50	<1.0	---	---
MW6	05/27/11 d	---	192.41	27.07	165.34	No	---	---	---	---	---	---	---	---
MW6	**11/23/11**	**---**	**192.41**	**29.25**	**163.16**	**No**	**1,600b**	**6,400**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**---**	**---**
MW7	03/09/09	---	---	Well installed.										
MW7	03/30/09	---	194.34	29.15	165.19	No	55	66	<0.50	<0.50	<0.50	<0.50	---	---
MW7	04/02/09	---	194.34	Well surveyed.										
MW7	05/28/09	---	194.34	30.16	164.18	No	50	67	<1.0	<1.0	<1.0	<1.0	---	---
MW7	08/31/09	---	194.34	33.31	161.03	No	<50	12	<0.50	0.60	<0.50	<0.50	---	---
MW7	12/11/09	---	194.34	32.71	161.63	No	<50	31	0.78	1.7	0.62	2.4	---	---
MW7	05/07/10	---	194.34	27.54	166.80	No	510b	700	<0.50	<0.50	<0.50	<1.0	---	---
MW7	11/01/10	---	194.34	32.82	161.52	No	68b	140	<0.50	<0.50	<0.50	<1.0	---	---
MW7	05/27/11 d	---	194.34	28.85	165.49	No	---	---	---	---	---	---	---	---
MW7	**11/23/11**	**---**	**194.34**	**31.39**	**162.95**	**No**	**190b**	**300**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**---**	**---**
MW8	03/04/09	---	---	Well installed.										
MW8	03/30/09	---	192.96	27.35	165.61	No	<50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---
MW8	04/02/09	---	192.96	Well surveyed.										
MW8	05/28/09	---	192.96	28.72	164.24	No	<50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---
MW8	08/31/09	---	192.96	31.93	161.03	No	<50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---
MW8	12/11/09	---	192.96	31.24	161.72	No	<50	<0.50	0.74	1.6	0.59	2.3	---	---
MW8	05/07/10	---	192.96	25.68	167.28	No	<50	<0.50	<0.50	<0.50	<0.50	<1.0	---	---
MW8	11/01/10	---	192.96	31.18	161.78	No	<50	<0.50	<0.50	<0.50	<0.50	<1.0	---	---
MW8	05/27/11	---	192.96	27.55	165.41	No	<50	<0.50	<0.50	<0.50	<0.50	<1.0	---	---
MW8	**11/23/11**	**---**	**192.96**	**29.74**	**163.22**	**No**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**---**	**---**
MW9	03/05/09	---	---	Well installed.										
MW9	03/30/09	---	195.16	28.31	166.85	No	<50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---
MW9	04/02/09	---	195.16	Well surveyed.										
MW9	05/28/09	---	195.16	29.69	165.47	No	<50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---
MW9	08/31/09	---	195.16	33.20	161.96	No	<50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Former Exxon Service Station 70234
3450 35th Avenue
Oakland, California

Well ID	Sampling Date	Depth (feet)	TOC Elev. (feet)	DTW (feet)	GW Elev. (feet)	NAPL (feet)	TPHg (µg/L)	MTBE (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	Total Pb (µg/L)	Organic Pb (mg/L)
MW9	12/11/09	---	195.16	32.62	162.54	No	<50	<0.50	0.73	1.7	0.54	2.2	---	---
MW9	05/07/10	---	195.16	26.59	168.57	No	<50	<0.50	<0.50	<0.50	<0.50	<1.0	---	---
MW9	11/01/10	---	195.16	32.45	162.71	No	<50	<0.50	<0.50	<0.50	<0.50	<1.0	---	---
MW9	05/27/11	---	195.16	29.62	165.54	No	<50	<0.50	<0.50	<0.50	<0.50	<1.0	---	---
MW9	**11/23/11**	**---**	**195.16**	**30.56**	**164.60**	**No**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**---**	**---**
Grab Groundwater Samples														
Pit Water	06/14/02	11.5a	---	---	---	---	5,600	12,000	140	840	100	530	---	---
UST Pit	06/19/02	13.5a	---	---	---	---	680	640	2.7	36	18	130	---	---
W-38-B11	11/14/07	38	---	---	---	---	<50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---
W-15-B12	11/13/07	15	---	---	---	---	8,400	78	67	<5.0	140	150	---	---
W-40-B13	11/12/07	40	---	---	---	---	<50	0.53	<0.50	<0.50	<0.50	<0.50	---	---
W-15-B14	11/13/07	15	---	---	---	---	2,500	16	1.7	3.0	26	13	---	---
W-38-B15	11/15/07	38	---	---	---	---	18,000	12,000	3,400	2,500	330	2,000	---	---
W-40-B16	11/15/07	40	---	---	---	---	<50	7.7	<0.50	<0.50	<0.50	<0.50	---	---
W-37-B17	11/13/07	37	---	---	---	---	630	2,200	1.8	<0.50	4.1	1.4	---	---
W-38-B18	11/12/07	38	---	---	---	---	4,300	1,400	52	<12	56	96	---	---
W-35-B19	03/03/09	35	---	---	---	---	4,400	7,100	<0.50	<0.50	<0.50	<1.0	---	---
W-35-B20	03/03/09	35	---	---	---	---	640	440	<0.50	<0.50	<0.50	<1.0	---	---
W-35-B21	03/03/09	35	---	---	---	---	<50	1.4	<0.50	<0.50	<0.50	<1.0	---	---

TABLE 1A
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Former Exxon Service Station 70234
3450 35th Avenue
Oakland, California

Notes:		Data prior to 1999 provided by EA Environmental Science and Engineering in previously submitted reports.
TOC Elev.	=	Top of well casing elevation; datum is mean sea level.
DTW	=	Depth to water.
GW Elev.	=	Groundwater elevation; datum is mean sea level.
NAPL	=	Non-aqueous phase liquid.
TPHg	=	Total petroleum hydrocarbons as gasoline analyzed using EPA Method 8015.
MTBE	=	Methyl tertiary butyl ether analyzed using EPA Method 8260.
BTEX	=	Benzene, toluene, ethylbenzene, and total xylenes analyzed using EPA Method 8260B8020/8021B; during March 2009, analyzed using EPA Method 8020/8021B.
Total Pb	=	Total lead analyzed using EPA Method 6010.
Organic Pb	=	Organic lead analyzed using CA DHS LUFT method.
EDB	=	1,2-dibromoethane analyzed using EPA Method 8260B.
1,2-DCA	=	1,2-dicloroethane analyzed using EPA Method 8260B.
TAME	=	Tertiary amyl methyl ether analyzed using EPA Method 8260B.
TBA	=	Tertiary butyl alcohol analyzed using EPA Method 8260B.
ETBE	=	Ethyl tertiary butyl ether analyzed using EPA Method 8260B.
DIPE	=	Di-isopropyl ether analyzed using EPA Method 8260B.
Ethanol	=	Ethanol analyzed using EPA Method 8260B.
µg/L	=	Micrograms per liter.
mg/L	=	Milligrams per liter.
<	=	Less than the stated laboratory reporting limit.
---	=	Not sampled/Not analyzed/Not measured/Not applicable.
a	=	Approximate depth to groundwater surface at time of sampling.
b	=	Hydrocarbon pattern does not match the requested fuel.
c	=	Analyte presence was not confirmed by second column or GC/MS analysis.
d	=	Well inaccessible for sampling.

TABLE 1B
ADDITIONAL CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Former Exxon Service Station 70234
3450 35th Avenue
Oakland, California

Well ID	Sampling Date	Depth (feet)	EDB (µg/L)	1,2-DCA (µg/L)	TAME (µg/L)	TBA (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Ethanol (µg/L)
Monitoring Well Samples									
MW1	07/17/92 - 09/20/99	---	Not analyzed for these analytes.						
MW1	Well destroyed in June 2000.	---							
MW2	07/17/92 - 09/20/99	---	Not analyzed for these analytes.						
MW2	Well destroyed in June 2000.	---							
MW3	07/17/92 - 09/20/99	---	Not analyzed for these analytes.						
MW3	Well destroyed in June 2000.	---							
MW4	03/30/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW4	05/28/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW4	08/31/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW4	12/11/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW4	05/07/10	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW4	11/01/10	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW4	05/27/11 d	---	---	---	---	---	---	---	---
MW4	**11/23/11**	**---**	**<0.50**	**<0.50**	**<0.50**	**<5.0**	**<0.50**	**<0.50**	**---**
MW5	03/30/09	---	<12	17	<12	450	<12	<12	---
MW5	05/28/09	---	<25	<25	<25	530	<25	<25	---
MW5	08/31/09	---	<100	<100	<100	<1,000	<100	<100	---
MW5	12/11/09	---	<100	<100	<100	2,000	<100	<100	---
MW5	05/07/10	---	<25	<25	<25	400	<25	<25	---
MW5	11/01/10	---	<50	<50	<50	1,500	<50	<50	---
MW5	05/27/11 d	---	---	---	---	---	---	---	---
MW5	**11/23/11**	**---**	**<50**	**<50**	**<50**	**<500**	**<50**	**<50**	**---**
MW6	03/30/09	---	<0.50	<0.50	1.3	410	<0.50	0.82	---
MW6	05/28/09	---	<100	<100	<100	<1,000	<100	<100	---
MW6	08/31/09	---	<100	<100	<100	1,100	<100	<100	---
MW6	12/11/09	---	<100	<100	<100	2,600	<100	<100	---
MW6	05/07/10	---	<100	<100	<100	<1,000	<100	<100	---
MW6	11/01/10	---	<50	<50	<50	2,400	<50	<50	---
MW6	05/27/11 d	---	---	---	---	---	---	---	---

TABLE 1B
ADDITIONAL CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Former Exxon Service Station 70234
3450 35th Avenue
Oakland, California

Well ID	Sampling Date	Depth (feet)	EDB (µg/L)	1,2-DCA (µg/L)	TAME (µg/L)	TBA (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Ethanol (µg/L)
MW6	**11/23/11**	**---**	**<100**	**<100**	**<100**	**<1,000**	**<100**	**<100**	**---**
MW7	03/30/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW7	05/28/09	---	<1.0	<1.0	<1.0	<10	<1.0	<1.0	---
MW7	08/31/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW7	12/11/09	---	<0.50	<0.50	<0.50	12	<0.50	<0.50	---
MW7	05/07/10	---	<0.50	<0.50	<0.50	130	<0.50	<0.50	---
MW7	11/01/10	---	<2.5	<2.5	<2.5	27	<2.5	<2.5	---
MW7	05/27/11 d	---	---	---	---	---	---	---	---
MW7	**11/23/11**	**---**	**<5.0**	**<5.0**	**<5.0**	**<50**	**<5.0**	**<5.0**	**---**
MW8	03/30/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW8	05/28/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW8	08/31/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW8	12/11/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW8	05/07/10	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW8	11/01/10	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW8	05/27/11	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW8	**11/23/11**	**---**	**<0.50**	**<0.50**	**<0.50**	**<5.0**	**<0.50**	**<0.50**	**---**
MW9	03/30/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW9	05/28/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW9	08/31/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW9	12/11/09	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW9	05/07/10	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW9	11/01/10	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW9	05/27/11	---	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	---
MW9	**11/23/11**	**---**	**<0.50**	**<0.50**	**<0.50**	**<5.0**	**<0.50**	**<0.50**	**---**
Grab Groundwater Samples									
Pit Water	06/14/02	11.5a	---	---	---	---	---	---	---
UST Pit	06/19/02	13.5a	---	---	---	---	---	---	---
W-38-B11	11/14/07	38	<0.50	<0.50	<0.50	<10	<0.50	<0.50	<50
W-15-B12	11/13/07	15	<5.0	<5.0	<5.0	<100	<5.0	<5.0	<500
W-40-B13	11/12/07	40	<0.50	<0.50	<0.50	<10	<0.50	<0.50	<50

TABLE 1B
ADDITIONAL CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Former Exxon Service Station 70234
3450 35th Avenue
Oakland, California

Well ID	Sampling Date	Depth (feet)	EDB (µg/L)	1,2-DCA (µg/L)	TAME (µg/L)	TBA (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Ethanol (µg/L)
W-15-B14	11/13/07	15	<1.0	<1.0	<1.0	<20	<1.0	<1.0	<100
W-38-B15	11/15/07	38	<25	<25	<25	1,900	<25	<25	<2,500
W-40-B16	11/15/07	40	<0.50	<0.50	<0.50	<10	<0.50	<0.50	85
W-37-B17	11/13/07	37	<0.50	<0.50	<0.50	58	<0.50	<0.50	<50
W-38-B18	11/12/07	38	<12	<12	<12	<250	<12	<12	<1,200
W-35-B19	03/03/09	35	<50	<50	<50	<500	<50	<50	<5,000
W-35-B20	03/03/09	35	<0.50	<0.50	<0.50	12	<0.50	<0.50	<50
W-35-B21	03/03/09	35	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<50

TABLE 1B
ADDITIONAL CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
Former Exxon Service Station 70234
3450 35th Avenue
Oakland, California

Notes:		Data prior to 1999 provided by EA Environmental Science and Engineering in previously submitted reports.
TOC Elev.	=	Top of well casing elevation; datum is mean sea level.
DTW	=	Depth to water.
GW Elev.	=	Groundwater elevation; datum is mean sea level.
NAPL	=	Non-aqueous phase liquid.
TPHg	=	Total petroleum hydrocarbons as gasoline analyzed using EPA Method 8015.
MTBE	=	Methyl tertiary butyl ether analyzed using EPA Method 8260.
BTEX	=	Benzene, toluene, ethylbenzene, and total xylenes analyzed using EPA Method 8260B8020/8021B; during March 2009, analyzed using EPA Method 8020/8021B.
Total Pb	=	Total lead analyzed using EPA Method 6010.
Organic Pb	=	Organic lead analyzed using CA DHS LUFT method.
EDB	=	1,2-dibromoethane analyzed using EPA Method 8260B.
1,2-DCA	=	1,2-dicloroethane analyzed using EPA Method 8260B.
TAME	=	Tertiary amyl methyl ether analyzed using EPA Method 8260B.
TBA	=	Tertiary butyl alcohol analyzed using EPA Method 8260B.
ETBE	=	Ethyl tertiary butyl ether analyzed using EPA Method 8260B.
DIPE	=	Di-isopropyl ether analyzed using EPA Method 8260B.
Ethanol	=	Ethanol analyzed using EPA Method 8260B.
µg/L	=	Micrograms per liter.
mg/L	=	Milligrams per liter.
<	=	Less than the stated laboratory reporting limit.
---	=	Not sampled/Not analyzed/Not measured/Not applicable.
a	=	Approximate depth to groundwater surface at time of sampling.
b	=	Hydrocarbon pattern does not match the requested fuel.
c	=	Analyte presence was not confirmed by second column or GC/MS analysis.
d	=	Well inaccessible for sampling.

APPENDIX E

CRA's STANDARD FIELD OPERATING PROCEDURES

Conestoga-Rovers & Associates

STANDARD FIELD PROCEDURES FOR MONITORING WELL INSTALLATION

This document presents standard field methods for drilling and sampling soil borings and installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOIL BORINGS

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Professional Geologist (P.G.) or Professional Engineer (P.E.).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe®. Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments at the bottom of the borehole.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Analysis

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4^{o} C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable volatile vapor analyzer measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer measurements are used along with the field observations, odors, stratigraphy and groundwater depth to select soil samples for analysis.

Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch® type sampler or are collected from the open borehole using bailers. The groundwater samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying

Groundwater monitoring wells are installed to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two feet above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security.

The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite and covered by plastic sheeting. At least three individual soil samples are collected from the stockpiles and composited at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples in addition to any analytes required by the receiving disposal facility. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Groundwater removed during development and sampling is typically stored onsite in sealed 55-gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Upon receipt of analytic results, the water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.