**Timothy L. Bishop**
Project Manager
Marketing Business Unit

**Chevron Environmental Management Company**
6101 Bollinger Canyon Road
San Ramon, CA 94583
Tel (925) 790-6463
TimBishop@chevron.com

September 13, 2013

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

**Re:** **Unocal No. 3538 (351642)**
**411 West MacArthur Boulevard, Oakland, California**
**Fuel Leak Case No. RO0000251**
**Geotracker Global ID # T0600101472**

I have reviewed the attached report dated September 13, 2013.

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 AECOM, upon whose assistance and advice I have relied.

This letter is submitted pursuant to the requirements of California Water Code Section 13257(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,

Tim Bishop
Project Manager

Attachment: Response to Technical Comments by AECOM

AECOM
10461 Old Placerville Road
Suite 170
Sacramento, CA 95827
www.aecom.com

916 361 6400 tel
916 361 6401 fax

September 13, 2013

Keith Nowell
Alameda County Health Care Services Agency
Environmental Health Services
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

**Subject:** **Response to Technical Comments**
**Unocal No. 3538 (351642)**
**411 West MacArthur Boulevard, Oakland, California**
**Fuel Leak Case No. RO0000251**
**Geotracker Global ID # T0600101472**

Dear Mr. Nowell,

On behalf of Chevron Environmental Management Company, for itself and as Attorney-in-Fact for Union Oil Company of California (hereinafter "EMC"), AECOM has prepared a focused Site Conceptual Model (SCM), Data Gap Investigation Plan, and Path to Closure Schedule for the Unocal No. 3538 site located at 411 West MacArthur Boulevard in Oakland, California .The attached documents were prepared in response to Alameda County Environmental Health's (ACEH) letter dated May 24, 2013 providing technical comments to the Low Threat Case Closure Request submitted by AECOM on March 27, 2013 A deadline extension to September 13, 2013 was requested and granted on August 5, 2013.

Also In the May 2013 response letter, ACEH indicated that documents were missing from GeoTracker, effecting compliance with the Electronic Submittal of Information (ESI) required by California Code of Regulations, Title 23, Division 3, Chapter 16. AECOM finished uploading the documents to the Geotracker database on September 13, 2013

## Remarks/Signatures

The interpretations in the attached documents represent AECOM's professional opinions which are are based on currently available information and are arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

If you have any questions regarding this project, please contact James Harms at (916) 361-6412.

Sincerely,

James Harms
Project Manager

Tiina Couture, PE# 57193
Project Engineer

cc: Tim Bishop EMC (via electronic copy)
Mr. Kevin Ma & Mr. Arthur Yu, property owner (via paper copy)

**Attachments**

Attachment A ACEH Deadline Extension
Attachment B Focused Site Conceptual Model
Attachment C Data Gap Investigation Plan
Attachment D Path to Closure Schedule

# Attachment A

# ACEH Deadline Extension

## Harms, James

**From:** Bishop, Timothy L [TimBishop@chevron.com]
**Sent:** Monday, August 05, 2013 8:50 AM
**To:** Harms, James
**Subject:** FW: Case No. RO0000251 - 411 West MacArthur Boulevard, Oakland

FYI. Please upload to STRATA.

Thanks,

Timothy L. Bishop, P.G.
CEMC Project Manager
Mobile: 925.588.4662

---

From: Nowell, Keith, Env. Health [mailto:Keith.Nowell@acgov.org]
Sent: Monday, August 05, 2013 8:44 AM
To: Bishop, Timothy L
Subject: RE: Case No. RO0000251 - 411 West MacArthur Boulevard, Oakland

Mr. Timothy Bishop,

As we discussed, the extension to September 13, 2013 has been approved for the case RO251. Please submit a work plan to our office if you contemplate additional subsurface investigation associated with our May 24, 2013 directive letter.

Regards,
Keith Nowell

Keith Nowell PG, CHG
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda , CA 94502-6540
phone: 510 / 567 - 6764
fax: 510 / 337 - 9335
email: keith.nowell@acgov.org

PDF copies of case files can be reviewed/downloaded at:

*http://www.acgov.org/aceh/lop/ust.htm*

---

From: Bishop, Timothy L [mailto:TimBishop@chevron.com]
Sent: Wednesday, July 31, 2013 3:06 PM
To: Nowell, Keith, Env. Health
Cc: Harms, James
Subject: Case No. RO0000251 - 411 West MacArthur Boulevard, Oakland

Mr. Keith Nowell

Re: Unocal No. 3538 (351642)
411 West MacArthur Boulevard, Oakland, California
ACEH Fuel Leak Case No. RO0000251
GeoTracker Global ID T0600101472

As discussed this afternoon, I am writing to request an extension to the due dates provided in the May 24, 2013 directive letter (attached) from ACEH regarding the above referenced site. An extension to September 13, 2013 is requested for submittal of the Data Gap Investigation Plan, Focused Site Conceptual Model, and Path to Closure Schedule. The revised schedule will allow sufficient time to incorporate well search information from Alameda County Public Works Agency's well database and also to investigate access issues as they pertain to potential sampling locations (Two offsite soil borings were not installed in 2010 due to an inability to gain access and/or secure the required permits).

Please feel free to contact me if you have any questions or comments.

Thank you,

Timothy L. Bishop, P.G.
Project Manager

Chevron Environmental Management Company
6101 Bollinger Canyon Road, Suite 5353
San Ramon, CA 94583
Office: 925.790.6463
Mobile: 925.588.4662
TimBishop@chevron.com

# Attachment B

# Focused Site Conceptual Model

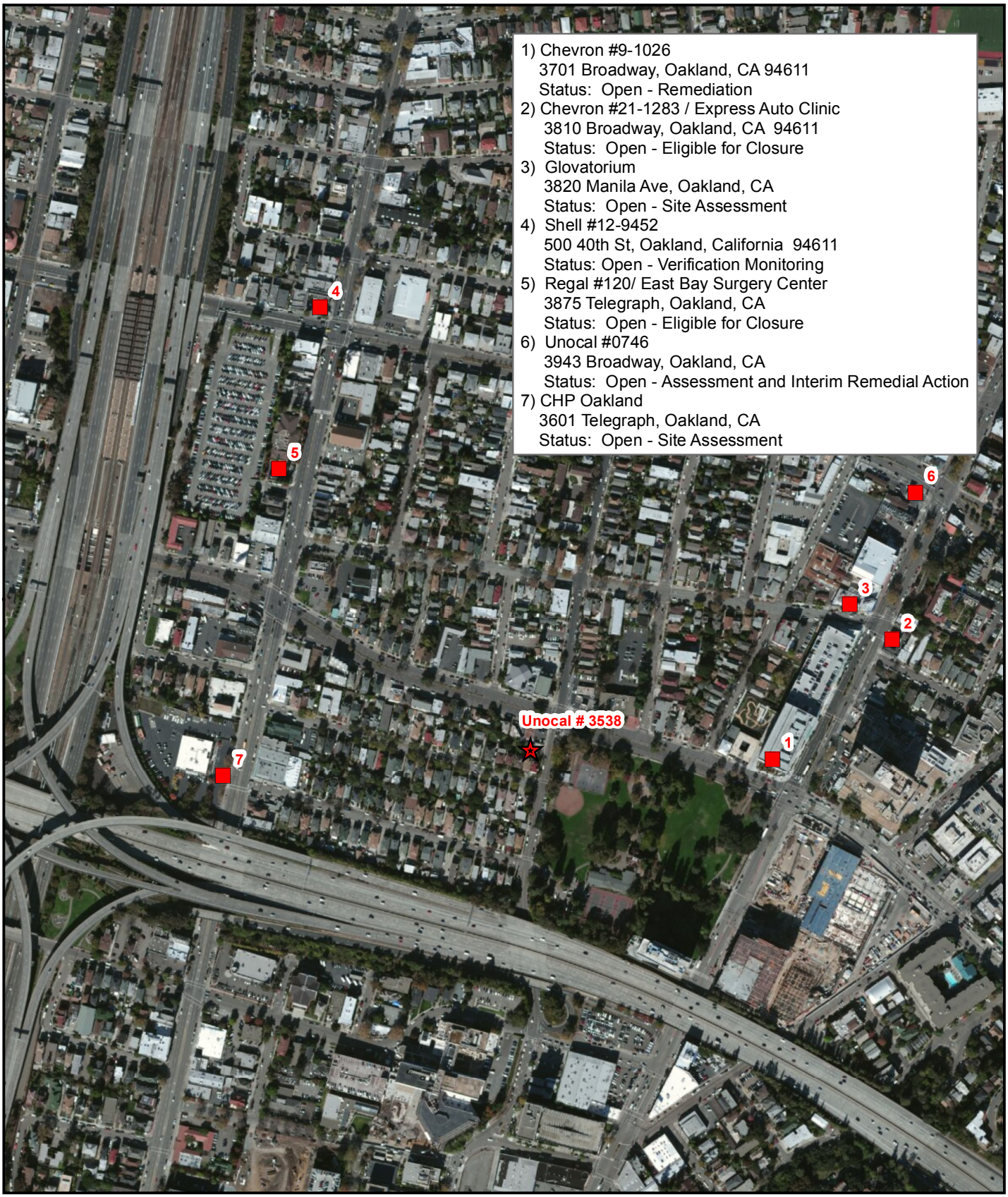
Attachment B
Focused Site Conceptual Model
Unocal No. 3538 (351642)
411 West MacArthur Boulevard, Oakland, California

| SCM Element | SCM Sub-Element | Description | Reference | Data Tables/Graphics | Data Gaps | Work to Address Data Gap |
|---|---|---|---|---|---|---|
| Regional Setting | Geology/ Hydrogeology | The site is located in the Santa Clara Valley Groundwater Basin and the East Bay Plain Subbasin, which is a northwest-trending plain bounded on the north by San Pablo Bay, on the south by the Niles Cone Groundwater Basin, and on the east by contact with Franciscan Basement rock. The East Bay Plain Subbasin extends beneath San Francisco Bay to the west. The subbasin aquifer system consists of unconsolidated Quaternary sediment. These deposits include the early Pleistocene Santa Clara Formation, the late Pleistocene Alameda Formation, the early Holocene Temescal Formation, and artificial fill. The cumulative thickness of the unconsolidated sediments is about 1,000 feet (DWR, 2004).<br><br>Numerous creeks cross the subbasin capturing runoff from the foothills east of the Hayward fault. The groundwater flow is east to west, generally reflecting the local topography. The regional groundwater flow direction and velocity are influenced by buried stream channels that are typically oriented in east-west directions (SFBRWQCB, 1999). The total depths of domestic wells within the subbasin reportedly range from 32 to 525 feet with an average of 206 feet. Total depth of municipal and irrigation wells range from 29 to 630 feet with an average of 191 feet. | Department of Water Resources, 2004,California's Groundwater Bulletin – Santa Clara Valley Groundwater Basin, East Bay Plain Subbasin, February.<br><br>San Francisco Bay Regional Water Quality Control Board Groundwater Committee, 1999, East Bay Plain Groundwater Basin Beneficial Use Evaluation Report, August. | | LTCP Technical Review Comment 2 ii, The effect of westerly trending buried stream channels is not addressed. | The buried stream channels are described in a beneficial use evaluation report in conjunction with regional trends in groundwater flow. Buried stream channels have not been identified near the subject site. |
| | Surface Water | Based on a review of USGS topo maps and Google Earth, the San Francisco Bay is located approximately 1.5 miles west of the site, Lake Merritt is located approximately 1 mile south of the site, and a smaller unnamed water body is located approximately one-half mile to the northeast. Glen Echo Creek is located approximately one-quarter mile to the southeast. Surface drainage appears to flow to the southwest. | USGS 7.5-minute topo, Oakland West Quadrangle, 1993 and Oakland, California, 37° 49' 30.32"N, 122° 43' 43.23"W, Google Earth. August 28, 2012. September 4, 2013. | | | |
| | Nearby Wells | No municipal wells have been identified within a half mile radius of the site (Delta 2008). A Department of Water Resources file search in 2002 revealed that there are no water supply wells located within 2,000 feet of the site. The nearest well identified was a private water well located approximately 2,500 feet east-southeast of the site, in the cross gradient groundwater flow direction (Antea Group 2011). | Delta Consultants, Inc., 2008, Site Conceptual Model, November 21.<br><br>Antea Group, 2011, Additional Assessment Report, February 18. | | LTCP Technical Comment 2.iii.: The 2002 well survey performed did not include a search of the Alameda County Public Works (ACPW) well database. | A well search request was submitted on August 5, 2013 to ACPW. The SCM will be updated when the results are received. |
| | Nearby Release Sites | Nearby release sites with open cases under Alameda County LOP/San Francisco Bay RWQCB (Region 2):<br><br>1) Chevron #9-1026<br>3701 Broadway, Oakland, CA 94611<br>Status: Open - Remediation<br>2) Chevron #21-1283 / Express Auto Clinic<br>3810 Broadway, Oakland, CA 94611<br>Status: Open - Eligible for Closure<br>3) Glovatorium<br>3820 Manila Ave, Oakland, CA<br>Status: Open - Site Assessment<br>4) Shell #12-9452<br>500 40th St, Oakland, California 94611<br>Status: Open - Verification Monitoring<br>5) Regal #120/ East Bay Surgery Center<br>3875 Telegraph, Oakland, CA<br>Status: Open - Eligible for Closure<br>6) Unocal #0746<br>3943 Broadway, Oakland, CA<br>Status: Open - Assessment and Interim Remedial Action<br>7) CHP Oakland<br>3601 Telegraph, Oakland, CA<br>Status: Open - Site Assessment<br><br>In addition, A&P Service Center/Valero, located 150 feet to the northeast of the site, is a permitted UST facility. No leaks have been reported at A&P Service Center/Valero. | geotracker.waterboards, ca.gov | Figure B1 - Nearby Release Sites | | |
| Site Setting | Site Description and Current Site Use | Unocal Number 3538 (Chevron Site Number 351642) is a former Unocal service station located on the southwestern corner of the intersection of West MacArthur Boulevard and Webster Street in Oakland, California (**Figure B2**). Two generations of fuel station facilities have been removed from the site: the first in 1989 and the second in 1998 (**Figure B3**). The station building and canopy were left in place following station decommissioning. A small alternator repair/distribution shop/car sales business currently uses the site property.<br><br>Land use in the vicinity consists of multiple-family residences to the south and west, a public church across the street to the north, and Mosswood Park to the east across Webster Street. No planned redevelopment activities were identified. | Delta Consultants, Inc., 2008, Site Conceptual Model, November 21. | Figure B2 - Site Location Map<br><br>Figure B3 - Site Plan | LTCP Technical Review Comment 1: Incomplete site history, current site use, and planned redevelopment activities. | Contact current site owner/operator: current site use is an alternator repair/distribution shop and car sales. |

| SCM Element | SCM Sub-Element | Description | Reference | Data Tables/Graphics | Data Gaps | Work to Address Data Gap |
|---|---|---|---|---|---|---|
| | Site Geology/ Hydrogeology | Silt and clay mixtures are encountered at the site from the surface to the total depth explored of 30 feet below ground surface (bgs). In some locations, these sediments are underlain by clayey sand and clayey gravel to 30 feet bgs. Intermittent, poorly graded sand layers are encountered from approximately 20 to 27 feet bgs.<br><br>The most recent groundwater monitoring event was conducted on February 14, 2013. Depth to groundwater measurements were recorded in six monitoring wells (MW-1 through MW-6). The depth to groundwater ranged from 13.66 to 17.98 feet below the top of well casings, and groundwater elevation ranged from 53.46 to 57.71 feet above mean sea level. The groundwater flow direction was calculated to flow to the south/southwest with an average hydraulic gradient of approximately 0.04 feet per foot (ft/ft). The current groundwater flow direction is shown on **Figure B4** (AECOM 2013).<br><br>The historical groundwater flow directions have been predominantly toward the south since April 1993 when wells MW-5 and MW-6 were included. Prior to 1993, with fewer wells being monitored, the groundwater flow direction was noted to be to the east. Hydrocarbons were not detected in groundwater samples from SB-2, which is located directly east of the site, indicating that the groundwater plume has not migrated in that direction (Delta 2008).<br><br>Historical groundwater flow direction was also discussed in the 2006 Soil and Groundwater Investigation Report, where TRC included a rose diagram that depicted the predominant groundwater flow directions through first quarter 2006 to be east and southwest; however, the existing data through third quarter 2010 were re-evaluated (Antea Group in 2011). The predominant flow directions were found to be south and south-southeast. Since the second quarter of 1994, all reported flow directions were reported to be generally southerly, ranging between east-southeast and southwest, with the exception of the second quarter of 2001 (northeast), and the third quarter of 2006 (west). Since the third quarter of 2007, reported flow directions have been to the south. | AECOM, 2013, First Semi-Annual 2013 Groundwater Monitoring Report, March 13, 2013.<br><br>Antea Group, 2011, Additional Assessment Report, February 18.<br><br>Delta Consultants, Inc., 2008, Site Conceptual Model, November 21. | Figure B4 - Groundwater Contour Map<br><br>Attachment B1 - Soil boring logs and well construction details.<br><br>Attachment B2 - Historical cross sections<br><br>Inconsistent Groundwater Flow Direction | LTCP Technical Comment 2. ii. | The easterly groundwater flow direction was noted prior to 1993 as explained under Site Geology/Hydrogeology, with the 1993 expanded well network the flow direction has been generally south. |
| | Site History | Site Ownership History According to the Alameda County Assessor is as follows:<br>In 1969, the site was owned by Sidney N. Barton<br>In 1972, the site was purchased by the Hebrew Institute<br>In 1974, the site was purchased by Teacher's Institute Annuity of North America<br>In March of 1983, the site was purchased by Continental Financial Services Corporation and,<br>On the same day in March of 1983, Union Oil Company of California purchased the property.<br>In 1997, the site was purchased by Tosco and,<br>In 1999, the site was purchased by Arthur Yu and Kevin Ma<br><br>Prior to 1983 the site was owned by private non-industrial parties, site use during those years is uncertain. Documentation of the original installation of the underground storage tanks (USTs) was not available; however, site ownership prior to 1983 would make prior UST use and installation unlikely. The site operated as a service station for 15 years from 1983 until 1998 (Delta 2008). In 1999 the sold was sold by Tosco and has been used as a used car lot and more recently also for alternator sales/distribution since 1999. There are no planned redevelopment activities.<br><br>In July 1989, Kaprealian Engineering, Inc. (KEI) oversaw replacement of two (one 10,000-gallon and one 12,000-gallon) gasoline USTs with two new 12,000-gallon gasoline USTs. One 550-gallon used-oil UST and the associated piping for all three tanks were also removed. The used-oil UST was not replaced.<br><br>In September 1998, the second-generation fuel facilities including two 12,000-gallon gasoline USTs, two fuel dispenser islands, and associated product piping were removed. Documentation was not available regarding equipment located in the station building or whether vehicle repairs were conducted.<br><br>Environmental investigation and assessment activities have been ongoing since 1989. There are currently seven monitoring wells installed at the site. The wells are monitored and sampled semi-annually in the first and third quarters. Remedial activities conducted at the site include the excavation of approximately 830 cubic yards of soil (450 cubic yards in 1989 and 380 cubic yards in 1998) and the removal of 1,500 gallons of groundwater in 1989. | Delta Consultants, Inc., 2008, Site Conceptual Model, November 21. | Figure B3 - Site Plan | LTCP Technical Review Comment 1: Incomplete site history, current site use, planned redevelopment activities.<br><br>Confirm that no evidence of hoists or vehicle repairs is present inside of the site building. | Contacted Alameda County Assessor.<br><br>Perform site building inspection, see Attachment C. |

Attachment B
Focused Site Conceptual Model
Unocal No. 3538 (351642)
411 West MacArthur Boulevard, Oakland, California

| SCM Element | SCM Sub-Element | Description | Reference | Data Tables/Graphics | Data Gaps | Work to Address Data Gap |
|---|---|---|---|---|---|---|
| Distribution of Petroleum Hydrocarbons | Soil | The distribution of the maximum concentrations of for petroleum hydrocarbons detected in soil is shown in **Figure B5**. **Attachment B3** provides a summary of all historical soil laboratory analyses. The highest concentrations of TPHg (6,100 mg/kg), toluene (53 mg/kg), ethylbenzene (86 mg/kg), and total xylenes (420 mg/kg) were detected in the fuel UST source area in soil boring SB-3 at a depth of 16 feet bgs. The highest concentration of benzene (12 mg/kg) was detected in a sidewall sample (SW1) from the UST excavation; however, benzene was not detected in the confirmation sample [SW1(4)] from this location following the excavation. The highest concentration of benzene in soil left in place after excavation activities was detected near the UST excavation area for MW-2 (1.5 mg/kg) at 19 feet bgs. The highest concentration of MTBE (0.64 mg/kg) was detected for SB-3 at 14 feet bgs.<br><br>The horizontal extent of hydrocarbons in soil is defined by MW-3 to the north; SB-9 to the east; SB-10, SB-5, and SW1 (4) and SB-1 to the south; and SB-4 and MW-4 to the west as shown in **Figure B5** and **Attachment B3**.<br><br>Hydrocarbon impacted soil is generally encountered at depths deeper than 15 feet bgs on the eastern side of the property near the former gasoline USTs. | Antea Group, 2011, Additional Assessment Report, February 18.<br><br>Delta Consultants, Inc., 2008, Site Conceptual Model, November 21. | Figure B5 - Maximum Soil Concentration Map<br><br>Attachment B3 - Historical Soil Analytical | | |
| | Groundwater | Groundwater has been sampled at the site since 1989. Sample analyses have included TPHg, BTEX, and MTBE. The historical maximum concentrations of TPHg (21,000 micrograms per liter [µg/l]), benzene (1,300 µg/l), and MTBE (4,800 µg/l) were detected for MW-3 in 1991 and 1992 and have decreased since that time. Point attenuation graphs are provided for MW-2 and MW-3 as **Charts B1 and B2**, respectively. TPHg and benzene were not detected in groundwater above laboratory reporting limits during the most recent groundwater monitoring event conducted in February 2013). MTBE was detected in groundwater for one well, MW-3 at 5.1 µg/l, which is just above the Environmental Screening Level (ESL) of 5.0 µg/l, **Figure B6**. **Figures B7 and B8** show the decreasing size of the benzene and MTBE groundwater plumes, respectively, from the 1990s to the present. Groundwater analytical data tables are provided in **Attachment B4**.<br><br>Petroleum hydrocarbons in groundwater are defined by well MW-5 to the east, MW-2 to the south, MW-1 to the west, and MW-4 and MW-6 to the northwest and northeast, respectively.<br><br>Grab groundwater samples collected from soil borings during March 2006 and December 2010 show significantly higher hydrocarbon concentrations than groundwater samples collected at the same time from the monitoring well network (**Attachment B4**). This difference is likely due to the fine-grained nature of site soil and presence of entrained sediments in the samples. The grab groundwater samples confirm the groundwater impacts around the former gasoline UST pit and show decreasing concentrations with depth. The 2010 grab groundwater samples had lower hydrocarbon concentrations in samples collected from the same area onsite (SB-3W vs. SB-9 and SB-10 vs. SB-5W) showing decreasing concentrations over time. Benzene and MTBE were detected in grab groundwater samples from offsite soil boring SB-1W at 11 µg/l and 130 µg/l, respectively. Petroleum hydrocarbons were not detected in grab groundwater samples collected from SB-2W. | AECOM, 2013, First Semi-Annual 2013 Groundwater Monitoring Report, March 13. | Figures B6, B7, and B8<br><br>Charts B1 and B2<br><br>Attachment B4 - Groundwater Analytical Data and Historical Grab Groundwater Data | LTCP Technical Comment 2. I and iv. Downgradient assessment.<br><br>LTCP Technical Comment 2. v. Use of discrete well screens.<br><br>Two off-site, downgradient soil borings, SB-6 and SB-7, were proposed in a work plan submitted in May 2009 to further delineate downgradient hydrocarbon concentrations to the south. Due to permitting and access agreement issues, these soil borings were not drilled. | Two soil borings will be advanced (up to approximately 30 feet bgs) and converted to groundwater monitoring wells with discrete screen intervals. Soil lithology will be logged and soil and groundwater samples will be collected for laboratory analysis as described in Attachment C. |
| | Soil Vapor | Soil vapor has not been investigated at this site. The majority of the site soil is not impacted. In a 2011 report, Antea Group reported that benzene was not detected in confirmation samples collected in December 2010 at depths of 5 and 10 feet bgs and stated that this would indicate the potential for vapor intrusion in the vicinity of SB-3, MW-3, SB-8, SB-9, and SB-10 are minimal and no additional vapor intrusion assessment is necessary.<br><br>In addition, hydrocarbon concentrations in groundwater have not warranted screening for vapor intrusion risk. BTEX and MTBE detected in groundwater are well below the ESLs for potential vapor intrusion concern. Oxygen in soil vapor has also not been measured at this site. Also, the site has been redeveloped as a repair/distribution facility and a current petroleum source is not present. | Antea Group, 2011, Additional Assessment Report, February 18. | | | |
| Remedial Actions | Excavation | Remedial activities conducted at the site include the excavation of approximately 830 cubic yards of soil (450 cubic yards in 1989 and 380 cubic yards in 1998) and the removal of 1,500 gallons of groundwater.<br><br>In July 1989, during UST replacement activities, approximately 450 cubic yards of soil and 1,500 gallons of groundwater were removed from the UST pit and disposed of off-site. Analytical results for six soil confirmation sidewall samples collected at 10 feet bgs from the fuel tank pit indicated low concentrations of total petroleum hydrocarbons (TPH) as gasoline (TPHg) ranging from non-detectable to 11 milligrams per kilogram (mg/kg), except for one sample, which had 3,100 mg/kg of TPHg. A soil sample collected from the used-oil pit at 8.5 feet bgs had no detectable TPHg, TPH as diesel (TPHd), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Following the sidewall sampling, 1,500 gallons of groundwater was removed from the gasoline UST pit. Subsequent overexcavation of the fuel UST pit was performed by removing 4 linear feet (calculated removal of 50 cubic yards) from the southern and eastern sidewalls, near the soil sample location with 3,100 mg/kg of TPHg. The post excavation confirmation sample results were non-detect and 11 mg/kg for TPHg in two samples collected from SW-1(4) and SW4(2), respectively.<br><br>In September 1998, the second-generation USTs were removed. Soil samples were collected from beneath the former fuel USTs and the former product piping. Soil samples contained a maximum TPHg concentration of 360 mg/kg and benzene of 1.5 mg/kg at 19.5 feet, and methyl tert-butyl ether (MTBE) was not detected in any of the soil samples. Approximately 380 cubic yards of trenching and UST backfill materials from the second station configuration was stockpiled and later transported off-site during the 1998 station demolition. | Delta Consultants, Inc., 2008, Site Conceptual Model, November 21. | | | |



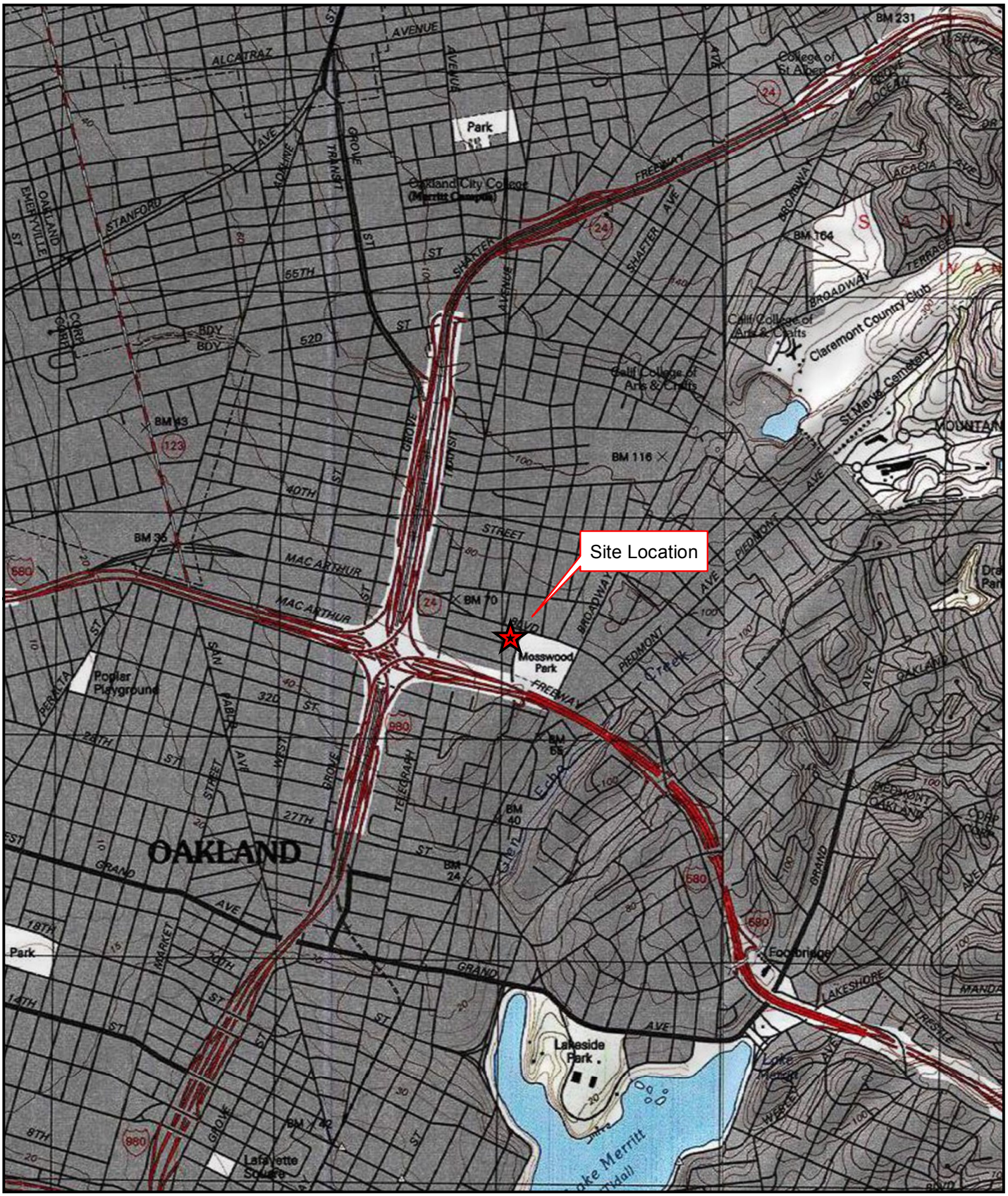

Map Source: ESRI Data Resource Center 2013.

500 250 0 500
Feet

AECOM
10461 Old Placervillle Rd, Suite 170
Sacramento, CA 95827
916.361.6400

| | | | | |
|---|---|---|---|---|
| Unocal No.3538 (351642)<br>411 West MacArthur Boulevard,<br>Oakland, California | | | **Nearby Release Sites** | |
| DATE:9/9/13 | DRWN: JH | Revision: 0 | | **Figure B1** |

Path: P:\01231-Chevron\76Products_transfer_sites\351642_3538_Oakland\7.0 Deliverables\7.2 CADD\GIS\Figure B1_release_sites_351642.mxd




Map Source: ESRI Data Resource Center 2013.

0.5 0.25 0 0.5 Miles

AECOM
10461 Old Placervillle Rd, Suite 170
Sacramento, CA 95827
916.361.6400

N

Unocal No.3538 (351642)
411 West MacArthur Boulevard,
Oakland, California

**Site Location Map**

| DATE:9/9/13 | DRWN: JH | Revision: 0 | | **Figure B2** |
|---|---|---|---|---|

Path: P:\01231-Chevron\76Products_transfer_sites\351642_3538_Oakland\7.0 Deliverables\7.2 CADD\GIS\Figure B2_site_location_351642.mxd

EVERGREEN MISSIONARY BAPTIST CHURCH

MW-6

VALERO STATION

*WEST MACARTHUR BOULEVARD*

MW-5

FORMER FIRST AND FIRST AND SECOND GENERATION GASOLINE USTs

MW-4

MW-3

419/421 WEST MACARTHUR BOULEVARD RESIDENCE

FORMER DISPENSER ISLANDS

MW-2

STATION BUILDING

MW-1

FORMER WASTE OIL UST

SITE BOUNDARY

MOSSWOOD PARK

*WEBSTER STREET*

RESIDENTIAL

416 37TH STREET RESIDENCE

414 37TH STREET RESIDENCE

3701 WEBSTER STREET RESIDENCE

LEGEND

- MONITORING WELL
- EXTENT OF 1989 EXCAVATION
- UST — UNDERGROUND STORAGE TANK

0 40'

SCALE

| REVISIONS | | | |
|---|---|---|---|
| NO.: | DESCRIPTION: | DATE: | BY: |

| DESIGNED BY: | DRAWN BY: | CHECKED BY: | APPROVED BY: |
|---|---|---|---|
| | JH | TC | JH |


AECOM

**AECOM TECHNICAL SERVICES**
10461 OLD PLACERVILLE ROAD, SUITE 170
SACRAMENTO, CALIFORNIA 95827
PHONE: (916) 361-6400
FAX: (916) 361-6401
WEB: HTTP://WWW.AECOM.COM


# Site Plan

Unocal No. 3538 (351642)
411 West MacArthur Blvd., Oakland, California

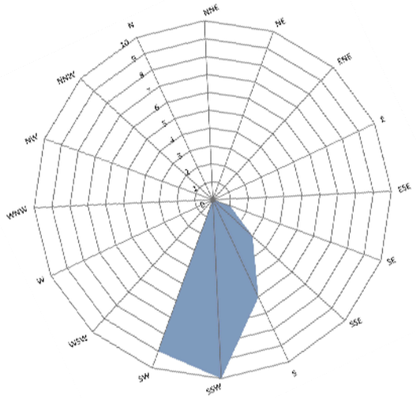
| SCALE: | DATE: | PROJECT NUMBER: |
|---|---|---|
| 1" = 40' | 3/11/2013 | 60284077 |

FIGURE NUMBER:

**B3**

SHEET NUMBER:

1 of 1




HISTORICAL GROUNDWATER
FLOW DIRECTION
1990 TO 1Q13

EVERGREEN
MISSIONARY
BAPTIST CHURCH

MW-6
57.71

VALERO STATION

[57.50]

WEST MACARTHUR BOULEVARD

[55.50]

MW-5
53.65

[53.50]

FORMER FIRST
AND FIRST
AND SECOND
GENERATION
GASOLINE
USTs

MW-4
53.86

MW-3
53.68

419/421
WEST
MACARTHUR
BOULEVARD

FORMER
DISPENSER
ISLANDS

STATION
BUILDING

MW-2
53.46

MW-1
54.14

FORMER
WASTE OIL
UST

SITE
BOUNDARY

MOSSWOOD PARK

WEBSTER STREET

416
37TH
STREET

414
37TH
STREET

3701
WEBSTER
STREET

## LEGEND

- MONITORING WELL
- *53.62* GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- *[53.50]* GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEAL LEVEL (DASHED WHERE INFERRED)
- GROUNDWATER FLOW DIRECTION
- EXTENT OF 1989 EXCAVATION
- HYDRAULIC GRADIENT = 0.04 FT/FT

Notes:
UST = underground storage tank
FT/FT = feet per foot

0 40'
SCALE

| REVISIONS | | | |
|---|---|---|---|
| NO.: | DESCRIPTION: | DATE: | BY: |

| DESIGNED BY: | DRAWN BY: | CHECKED BY: | APPROVED BY: |
|---|---|---|---|
| | JH | TC | JH |

AECOM TECHNICAL SERVICES
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WEB: HTTP://WWW.AECOM.COM

# GROUNDWATER CONTOUR MAP

First Semi-Annual 2013
Groundwater Monitoring Event
Chevron Site #351642 Former Unocal #3538
411 West MacArthur Blvd., Oakland, California

| SCALE: | DATE: | PROJECT NUMBER: |
|---|---|---|
| 1" = 40' | 3/11/2013 | 60284077 |

FIGURE NUMBER:

B4

SHEET NUMBER:

1 of 1

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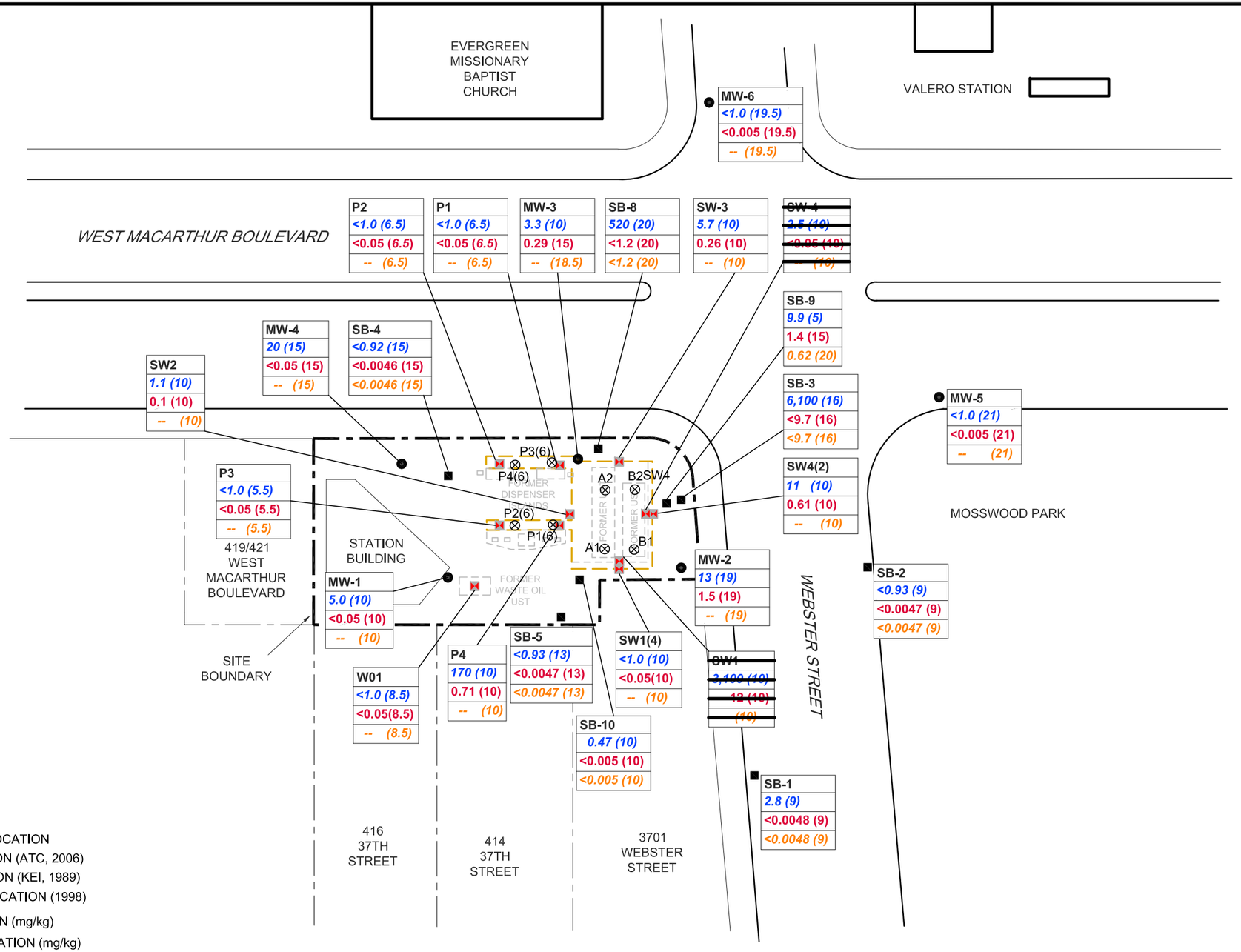


## LEGEND

- MONITORING WELL LOCATION
- SOIL BORING LOCATION (ATC, 2006)
- SOIL SAMPLE LOCATION (KEI, 1989)
- NEW SOIL SAMPLE LOCATION (1998)
- *17* TPHg CONCENTRATION (mg/kg)
- 0.23 BENZENE CONCENTRATION (mg/kg)
- *<0.0050* MTBE CONCENTRATION (mg/kg)
- EXTENT OF 1989 EXCAVATION

NOTE:
ONLY MAXIMUM CONCENTRATIONS ARE SHOWN. FOR SAMPLES WITHOUT CONCENTRATIONS, ONLY THE DEEPEST SAMPLE IS SHOWN. SAMPLE DEPTH IN FEET FOLLOW THE CONCENTRATIONS IN PARENTHESES.

-- = NOT DETECTED
STRIKETHROUGH = EXCAVATED SAMPLE

REVISIONS | NO.: | DESCRIPTION: | DATE: | BY:

DESIGNED BY: | DRAWN BY: RPR | CHECKED BY: RPR | APPROVED BY: JH

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# Maximum Soil Concentration Map

Chevron Site #351642 Former Unocal #3538
411 West MacArthur Blvd., Oakland, California

PROJECT NUMBER: 60284077
DATE: 2/12/2013
SCALE: 1" = 40'

FIGURE NUMBER: B5

SHEET NUMBER: 1 of 1

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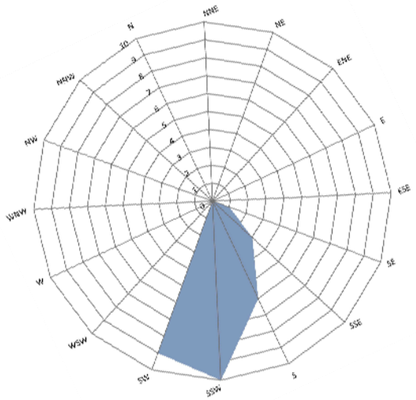


HISTORICAL GROUNDWATER
FLOW DIRECTION
1990 TO 1Q13

EVERGREEN
MISSIONARY
BAPTIST CHURCH

MW-6
NS
NS
NS

VALERO STATION

*WEST MACARTHUR BOULEVARD*

NS
NS
NS

<50
<0.30
5.1

MW-4

MW-3

FORMER FIRST AND FIRST AND SECOND GENERATION GASOLINE USTs

FORMER DISPENSER ISLANDS

419/421
WEST
MACARTHUR
BOULEVARD

STATION
BUILDING

MW-1

MW-2

FORMER WASTE OIL UST

NS
NS
NS

<50
<0.30
<1.0

SITE
BOUNDARY

MW-5
NS
NS
NS

MOSSWOOD PARK

*WEBSTER STREET*

416
37TH
STREET

414
37TH
STREET

3701
WEBSTER
STREET

## LEGEND

- MONITORING WELL
- <50 / <0.30 / 5.1 — TPH gasoline / BENZENE / MTBE
- GROUNDWATER FLOW DIRECTION
- EXTENT OF 1989 EXCAVATION
- ESTIMATED PLUME EXTENT
- HYDRAULIC GRADIENT = 0.04 FT/FT

Notes:
TPH = Total Petroleum Hydrocarbons
MTBE = methyl tertiary-butyl ether
UST = underground storage tank
FT/FT = feet per foot
Analyte Concentrations expressed in micrograms per liter.

0 40'
SCALE

REVISIONS

| NO.: | DESCRIPTION: | DATE: | BY: |
|---|---|---|---|
| | | | |

DESIGNED BY:
DRAWN BY: RPR
CHECKED BY: RPR
APPROVED BY: JH

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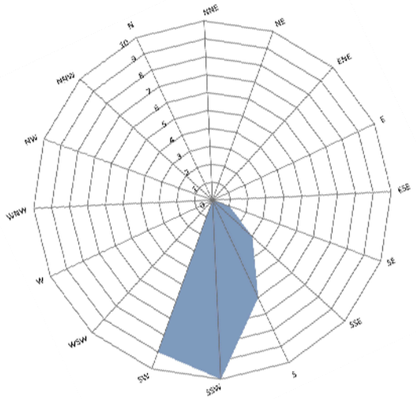
# GROUNDWATER CONCENTRATION MAP

First Semi-Annual 2013
Groundwater Monitoring Event
Chevron Site #351642 Former Unocal #3538
411 West MacArthur Blvd., Oakland, California

SCALE: 1" = 40'
DATE: 3/11/2013
PROJECT NUMBER: 60284077

FIGURE NUMBER:
B6

SHEET NUMBER:
1 of 1




HISTORICAL GROUNDWATER
FLOW DIRECTION
1990 TO 1Q13

EVERGREEN
MISSIONARY
BAPTIST CHURCH

MW-6
--
ND
<0,3
--

VALERO STATION

*WEST MACARTHUR BOULEVARD*

FORMER FIRST
AND FIRST
AND SECOND
GENERATION
GASOLINE
USTs

100
10
1

MW-5
–
ND
<0,3
–

MOSSWOOD PARK

419/421
WEST
MACARTHUR
BOULEVARD

MW-4
ND
ND
<0,3
--

MW-3
600
330
<0,3
<0,3

FORMER
DISPENSER
ISLANDS

STATION
BUILDING

MW-2
1

MW-1
ND
ND
<0,3
--

FORMER
WASTE OIL
UST

*WEBSTER STREET*

550
32
1.2
<0,3

SITE
BOUNDARY

416
37TH
STREET

414
37TH
STREET

3701
WEBSTER
STREET

## LEGEND

- MONITORING WELL
- EXTENT OF 1989 EXCAVATION
- 100 BENZENE EXTENT (APRIL 19, 1990)
- 10 BENZENE EXTENT (JULY 19, 1995)
- 1 BENZENE EXTENT(SEPTEMBER 30, 2005)

| | |
|---|---|
| benzene | APRIL 19, 1990 |
| benzene | JULY 19, 1995 |
| benzene | SEPTEMBER 30, 2005 |
| benzene | FEBRUARY 14, 2013 |

Notes:

ND NOT DETECTED

-- NOT SAMPLED

UST UNDERGROUND STORAGE TANK

BENZENE CONCENTRATIONS EXPRESSED IN MICROGRAMS PER LITER (MG/L).

<# = ANALYTE NOT DETECTED AT OR ABOVE INDICATED LABORATORY PRACTICAL QUANTITATIVE LIMIT

0 40'
SCALE

| REVISIONS | | | |
|---|---|---|---|
| NO.: | DESCRIPTION: | DATE: | BY: |

DESIGNED BY:
DRAWN BY: RPR
CHECKED BY: RPR
APPROVED BY: JH

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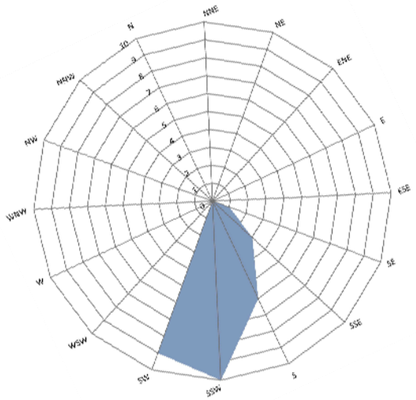
# GROUNDWATER DISSOLVED BENZENE CONCENTRATION MAP

Chevron Site #351642 Former Unocal #3538
411 West MacArthur Blvd., Oakland, California

SCALE: 1" = 40'
DATE: 2/12/2013
PROJECT NUMBER: 60284077

FIGURE NUMBER:
B7

SHEET NUMBER:
1 of 1




HISTORICAL GROUNDWATER
FLOW DIRECTION
1990 TO 1Q13

EVERGREEN
MISSIONARY
BAPTIST CHURCH

MW-6
--
<1.0
<1.0
--

VALERO STATION

*WEST MACARTHUR BOULEVARD*

FORMER FIRST
AND FIRST
AND SECOND
GENERATION
GASOLINE
USTs

100
50
50
5

MW-5
--
<1.0
<1.0
--

MOSSWOOD PARK

419/421
WEST
MACARTHUR
BOULEVARD

MW-4
--
<1.0
<1.0
--

MW-3
860
20
48
5.1

FORMER
DISPENSER
ISLANDS

MW-2

STATION
BUILDING

MW-1
--
<1.0
<1.0
--

FORMER
WASTE OIL
UST

*WEBSTER STREET*

250
<1.0
1.6
<1.0

SITE
BOUNDARY

416
37TH
STREET

414
37TH
STREET

3701
WEBSTER
STREET

## LEGEND

- MONITORING WELL
- 100 — MTBE EXTENT JULY 14, 1993
- 50 — MTBE EXTENT SEPTEMBER 27, 2007
- 50 — MTBE EXTENT SEPTEMBER 21, 2010
- 5 — MTBE EXTENT AUGUST 17, 2012
- EXTENT OF EXCAVATION

| | |
|---|---|
| MTBE | JULY 14, 1993 |
| MTBE | SEPTEMBER 27, 2007 |
| MTBE | SEPTEMBER 21, 2010 |
| MTBE | AUGUST 17, 2012 |

Notes:

-- NOT SAMPLED

UST UNDERGROUND STORAGE TANK

MTBE CONCENTRATIONS EXPRESSED IN MICROGRAMS PER LITER (MG/L).

<# = ANALYTE NOT DETECTED AT OR ABOVE INDICATED LABORATORY PRACTICAL QUANTITATIVE LIMIT

0 40'
SCALE

| REVISIONS | | | |
|---|---|---|---|
| NO.: | DESCRIPTION: | DATE: | BY: |

DESIGNED BY:
DRAWN BY: RPR
CHECKED BY: RPR
APPROVED BY: JH

AECOM TECHNICAL SERVICES
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# GROUNDWATER DISSOLVED MTBE CONCENTRATION MAP

Chevron Site #351642 Former Unocal #3538
411 West MacArthur Blvd., Oakland, California

SCALE: 1" = 40'
DATE: 2/12/2013
PROJECT NUMBER: 60284077

FIGURE NUMBER:
B8

SHEET NUMBER:
1 of 1

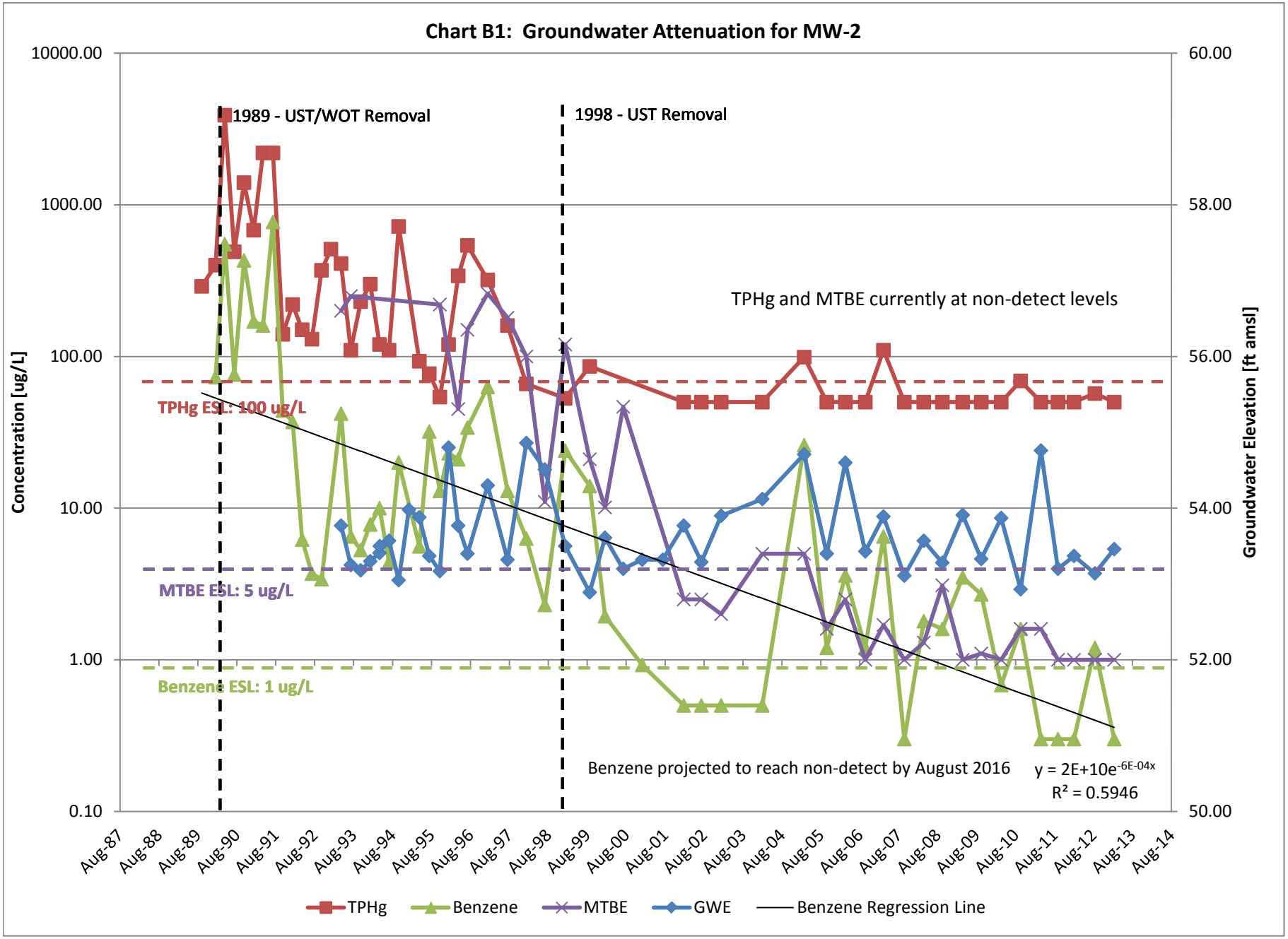


Chart B1: Groundwater Attenuation for MW-2
10000.00
1000.00
100.00
10.00
1.00
0.10
60.00
58.00
56.00
54.00
52.00
50.00
Concentration [ug/L]
Groundwater Elevation [ft amsl]
1989 - UST/WOT Removal
1998 - UST Removal
TPHg and MTBE currently at non-detect levels
TPHg ESL: 100 ug/L
MTBE ESL: 5 ug/L
Benzene ESL: 1 ug/L
Benzene projected to reach non-detect by August 2016
y = 2E+10e-6E-04x
R² = 0.5946
Aug-87
Aug-88
Aug-89
Aug-90
Aug-91
Aug-92
Aug-93
Aug-94
Aug-95
Aug-96
Aug-97
Aug-98
Aug-99
Aug-00
Aug-01
Aug-02
Aug-03
Aug-04
Aug-05
Aug-06
Aug-07
Aug-08
Aug-09
Aug-10
Aug-11
Aug-12
Aug-13
Aug-14
TPHg
Benzene
MTBE
GWE
Benzene Regression Line

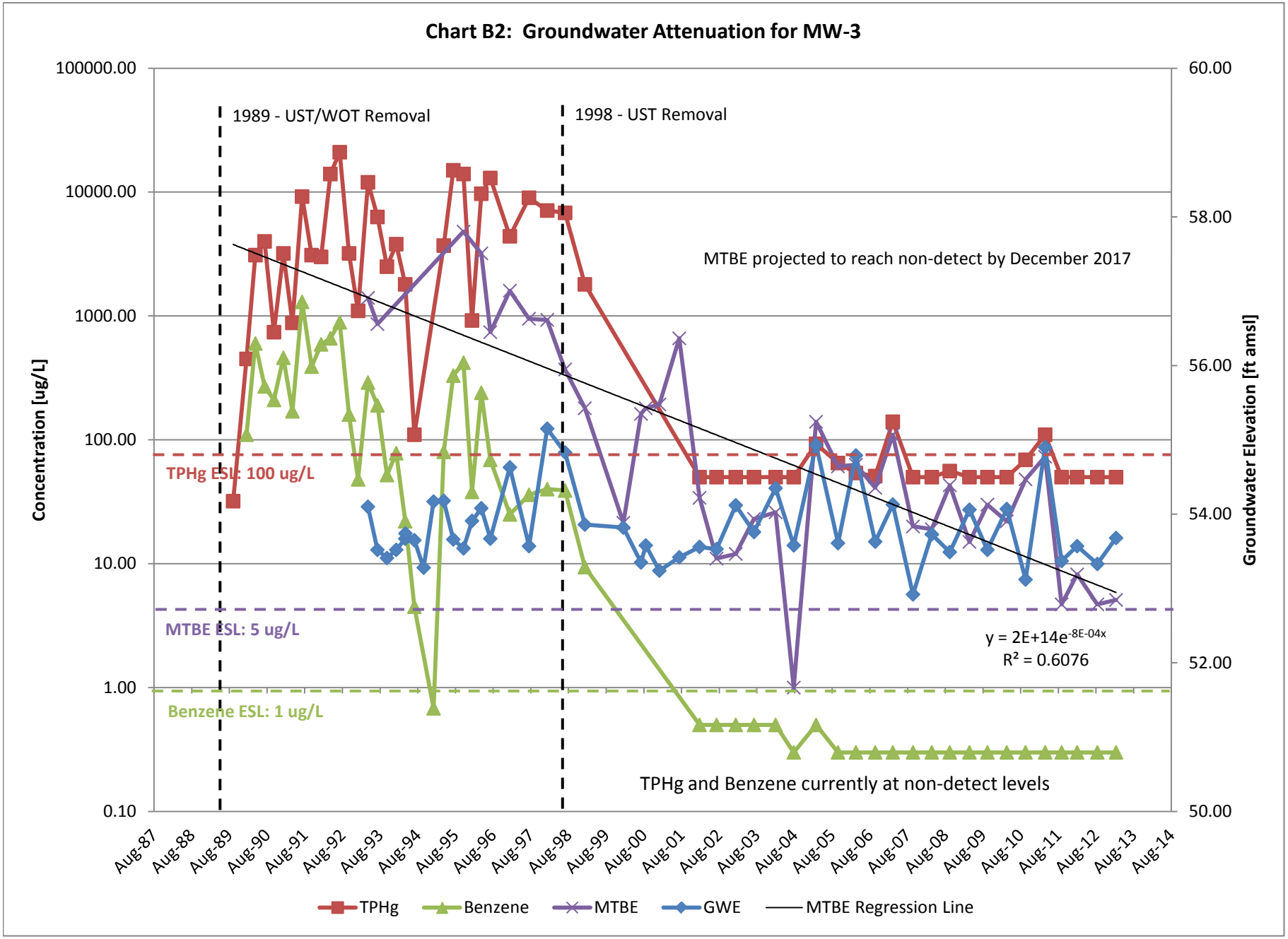


Chart B2: Groundwater Attenuation for MW-3
100000.00
10000.00
1000.00
100.00
10.00
1.00
0.10
Concentration [ug/L]
60.00
58.00
56.00
54.00
52.00
50.00
Groundwater Elevation [ft amsl]
1989 - UST/WOT Removal
1998 - UST Removal
MTBE projected to reach non-detect by December 2017
TPHg ESL: 100 ug/L
MTBE ESL: 5 ug/L
Benzene ESL: 1 ug/L
y = 2E+14e-8E-04x
R² = 0.6076
TPHg and Benzene currently at non-detect levels
Aug-87
Aug-88
Aug-89
Aug-90
Aug-91
Aug-92
Aug-93
Aug-94
Aug-95
Aug-96
Aug-97
Aug-98
Aug-99
Aug-00
Aug-01
Aug-02
Aug-03
Aug-04
Aug-05
Aug-06
Aug-07
Aug-08
Aug-09
Aug-10
Aug-11
Aug-12
Aug-13
Aug-14
TPHg
Benzene
MTBE
GWE
MTBE Regression Line

# BORING LOG

| | | |
|---|---|---|
| Project No.<br>KEI-P89-0703 | Boring & Casing Diameter<br>9" 2" | Logged By<br>D.L. |
| Project Name Unocal,<br>Oakland/MacArthur | Well Head Elevation<br>N/A | Date Drilled<br>9/7/89 |
| Boring No.<br>MW1 | Drilling Method<br>Hollow-stem Auger | Drilling Company<br>EGI |

| Penetration blows/6" | G. W. level | Depth (ft) Samples | Stratigraphy USCS | Description |
|---|---|---|---|---|
| | | 0 | | A.C. Pavement<br>Sand and Gravel: fill. |
| 11/17/22 | | 5 | | Clay, high plasticity, stiff, moist, very dark grayish brown. |
| | | | | Gravelly clay with sand, stiff, moist, dark yellowish brown. |
| 32/17/20 | | 10 | | Sand clay, high plasticity, stiff, moist, olive, trace gravel. |
| | | | CH | Clay, high plasticity, very stiff, moist, pale olive, with greenish gray stained root holes. |
| 13/17/19 | | 15 | | Sandy clay, moderate to high plasticity, stiff, moist, olive to light yellowish brown. |
| 10/17/20 | ▼ | | SC | Clayey sand, dense, very moist to wet, yellowish brown. |
| | | 20 | | |

# BORING LOG

| | | |
|---|---|---|
| Project No.<br>KEI-P89-0703 | Boring & Casing Diameter<br>9" 2" | Logged By<br>D.L. |
| Project Name Unocal,<br>Oakland/MacArthur | Well Head Elevation<br>N/A | Date Drilled<br>9/7/89 |
| Boring No.<br>MW1 | Drilling Method Hollow-stem Auger | Drilling Company<br>EGI |

| Penetration blows/6" | G. W. level | Depth (ft) Samples | Stratigraphy USCS | Description |
|---|---|---|---|---|
| | | | SC | Clayey sand, as above. |
| | | 25 | SP | Poorly graded sand, yellowish brown. |
| | | | CH | Clay, high plasticity, very stiff, moist, yellowish brown. |
| | | 30 | | |
| | | 35 | | |
| | | 40 | | TOTAL DEPTH 29' |

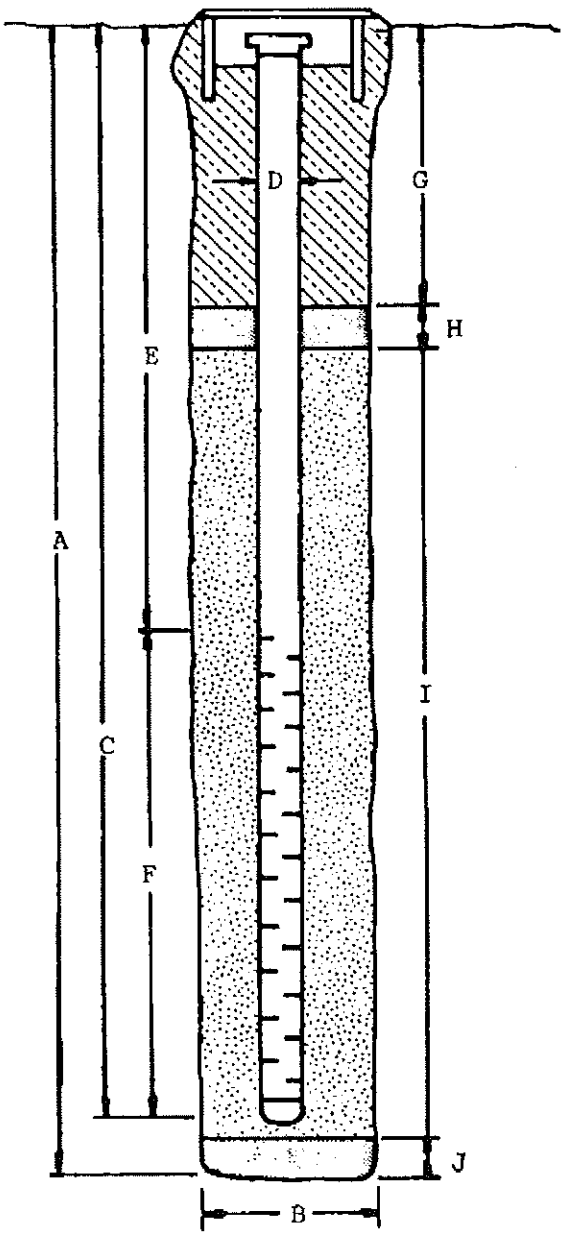
# WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - Oakland, MacArthur BORING/WELL NO. MW1

PROJECT NUMBER: KEI-P89-0703

WELL PERMIT NO.:

Flush-mounted Well Cover




A. Total Depth: 29'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 29'

Material: Schedule 40 PVC

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

E. Depth to Perforations: 5'

F. Perforated Length: 24'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 3'

Seal Material: Concrete

H. Seal: 1'

Seal Material: Bentonite

I. Gravel Pack: 25'

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-P89-0703 | Boring & Casing Diameter 9" 2" | Logged By D.L. |
|---|---|---|
| Project Name Unocal, Oakland/MacArthur | Well Head Elevation N/A | Date Drilled 9/6/89 |
| Boring No. MW2 | Drilling Method Hollow-stem Auger | Drilling Company EGI |

| Penetration blows/6" | G. W. level | Depth (ft) Samples | Stratigraphy USCS | Description |
|---|---|---|---|---|
| | | 0 | | Concrete Pavement |
| | | | | Sand and Gravel: Fill |
| | | | CH | Clay, high plasticity, with silt, firm to stiff, moist, dark olive gray, black from 1.5 to 4 feet. |
| 9/14/21 | | 5 | | |
| | | | GC | Clayey gravel with sand, dense, moist, yellowish brown, gravel to 3/4". |
| 13/15/28 | | 10 | | |
| | | | CH | Sandy clay, high plasticity, 15-45% sand, stiff, moist, light yellowish brown and greenish gray, mottled, lensed with clayey sand. |
| 9/15/19 | | | | |
| 10/15/23 | | | SC | Clayey sand, dense to very dense, moist, olive and greenish gray. |
| 8/10/15 | | 15 | | |
| 9/12/16 | | | CH | Silty clay, moderate to high plasticity, firm, moist, olive. |
| | ▼ | | SW | Well graded sand with gravel, dense, wet, brown, silty from 19.5 feet. |
| 13/37/46 | | 20 | | |

# BORING LOG

| Project No. | Boring & Casing Diameter | Logged By |
|---|---|---|
| KEI-P89-0703 | 9" 2" | D.L. |
| **Project Name** Unocal, Oakland/MacArthur | **Well Head Elevation** N/A | **Date Drilled** 9/6/89 |
| **Boring No.** MW2 | **Drilling Method** Hollow-stem Auger | **Drilling Company** EGI |

| Penetration blows/6" | G. W. level | Depth (ft) Samples | Stratigraphy USCS | Description |
|---|---|---|---|---|
| | | | GP-GM | Poorly graded gravel with silt and sand, very dense, wet, dark yellowish brown. |
| 25/37/45 | | 25 | GP | Poorly graded gravel with sand, very dense, wet, dark, yellowish brown. |
| | | | CH | Clay, high plasticity, trace sand, very stiff, moist, yellowish brown. |
| 25/29/35 | | 30 | | |
| | | 35 | | |
| | | 40 | | TOTAL DEPTH 30.5' |

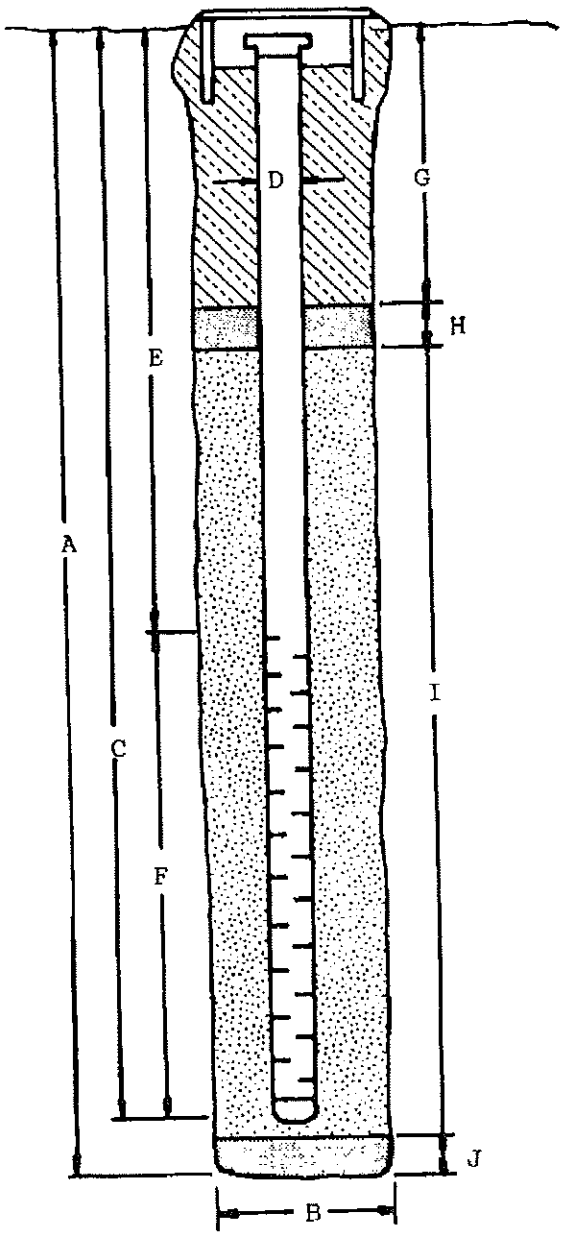
# WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - Oakland, MacArthur BORING/WELL NO. MW2

PROJECT NUMBER: KEI-P89-0703

WELL PERMIT NO.:

Flush-mounted Well Cover




A. Total Depth: 30'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 28.5'

Material: Schedule 40 PVC

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

E. Depth to Perforations: 3.5'

F. Perforated Length: 25'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 2'

Seal Material: Concrete

H. Seal: 1'

Seal Material: Bentonite

I. Gravel Pack: 27'

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.<br>KEI-P89-0703 | Boring & Casing Diameter<br>9" 2" | Logged By<br>D.L. |
| Project Name Unocal,<br>Oakland/MacArthur | Well Head Elevation<br>N/A | Date Drilled<br>9/7/89 |
| Boring No.<br>MW3 | Drilling Method<br>Hollow-stem Auger | Drilling Company<br>EGI |

| Penetration blows/6" | G. W. level | Depth (ft) Samples | Stratigraphy USCS | Description |
|---|---|---|---|---|
| | | 0 | | Concrete Pavement |
| 9/15/21 | | 5 | CH | Clay, high plasticity, with silt, stiff, moist, dark olive gray, very dark grayish brown above 4'. |
| 14/17/23 | | 10 | | Clay, high plasticity, very stiff, moist, pale olive, with dark greenish gray stained root holes. |
| 15/23/33 | | 15 | CL | Sandy clay, low to moderate plasticity, 25-40% sand, stiff, moist, olive and greenish gray, mottled, lensed with clayey sand. |
| 10/17/24 | ▼ | | CH | Sandy clay, moderate to high plasticity, stiff, moist, olive. |
| | | 20 | | |

# BORING LOG

| | | |
|---|---|---|
| Project No. KEI-P89-0703 | Boring & Casing Diameter 9" 2" | Logged By D.L. |
| Project Name Unocal, Oakland/MacArthur | Well Head Elevation N/A | Date Drilled 9/7/89 |
| Boring No. MW3 | Drilling Method Hollow-stem Auger | Drilling Company EGI |

| Penetration blows/6" | G. W. level | Depth (ft) Samples | Stratigraphy USCS | Description |
|---|---|---|---|---|
| | | | | Sandy clay, as above. |
| 37/50-5-1/2" | | | GP-GC | Poorly graded gravel with clay and sand, very dense, wet, dark yellowish brown. |
| | | 25 | GC | Clayey gravel, very dense, moist, yellowish brown. |
| | | 30 | | |
| | | 35 | | |
| | | 40 | | TOTAL DEPTH 29' |

# BORING LOG

| Project No. | Boring & Casing Diameter | Logged By |
|---|---|---|
| KEI-P89-0703 | 9" 2" | D.L. |
| **Project Name** Unocal, Oakland/MacArthur | **Well Head Elevation** N/A | **Date Drilled** 9/6/89 |
| **Boring No.** MW4 | **Drilling Method** Hollow-stem Auger | **Drilling Company** EGI |

| Penetration blows/6" | G. W. level | Depth (ft) Samples | Stratigraphy USCS | Description |
|---|---|---|---|---|
| | | 0 | | A.C. Pavement<br>Sand and Gravel: Fill |
| 12/16/25 | | 5 | | Clay, high plasticity, very stiff, moist, very dark grayish brown, brown below 5'. |
| | | | | Gravelly clay with sand, very stiff, moist, dark yellowish brown. |
| 19/25/30 | | 10 | CH | Clay, high plasticity, very stiff, slightly moist, light yellowish brown. |
| 14/17/29 | | 15 | | Silty clay, high plasticity, 10-15%, fine sand, very stiff, moist, pale olive. |
| 15/15/23 | ▼ | | SM | Silty sand, dense to very dense, very moist to wet, light yellowish brown. |
| | | 20 | SW | Well graded sand, trace to 10% |

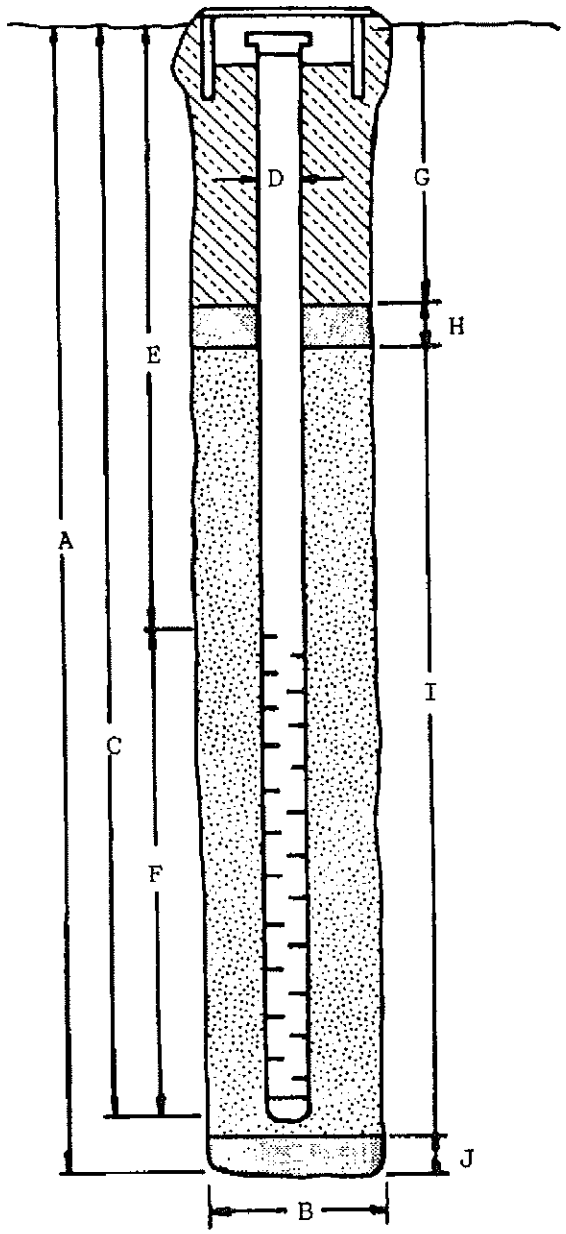
# WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - Oakland, MacArthur BORING/WELL NO. MW3

PROJECT NUMBER: KEI-P89-0703

WELL PERMIT NO.:

Flush-mounted Well Cover




A. Total Depth: 29'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 29'

Material: Schedule 40 PVC

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

E. Depth to Perforations: 5'

F. Perforated Length: 24'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 3'

Seal Material: Concrete

H. Seal: 1'

Seal Material: Bentonite

I. Gravel Pack: 25'

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.<br>KEI-P89-0703 | Boring & Casing Diameter<br>9" 2" | Logged By<br>D.L. |
| Project Name Unocal,<br>Oakland/MacArthur | Well Head Elevation<br>N/A | Date Drilled<br>9/6/89 |
| Boring No.<br>MW4 | Drilling Method<br>Hollow-stem Auger | Drilling Company<br>EGI |

| Penetration blows/6" | G. W. level | Depth (ft) Samples | Stratigraphy USCS | Description |
|---|---|---|---|---|
| | | | SW | fines, dense, wet, dark yellowish brown. |
| | | 25 | GP-GC | Poorly graded gravel with clay and sand, dense, wet, dark yellowish brown, clay content, increasing with depth. |
| | | | CH | Gravelly clay, high plasticity, 5-10% sand, very stiff, moist, dark yellowish brown. |
| | | 30 | | |
| | | 35 | | |
| | | 40 | | TOTAL DEPTH 29' |

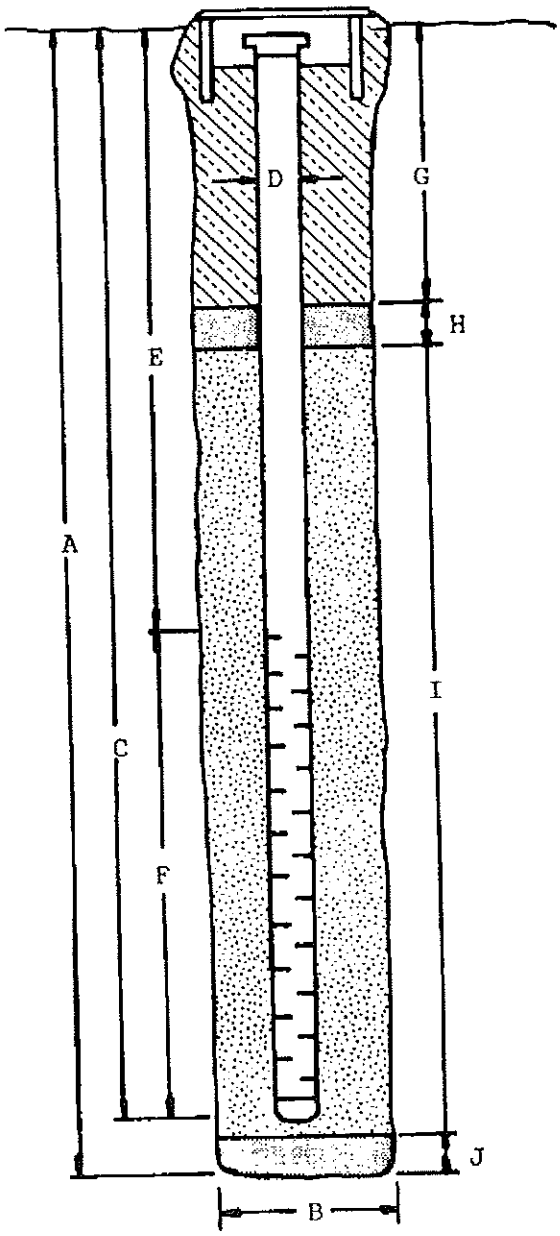
# WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal - Oakland, MacArthur BORING/WELL NO. MW4

PROJECT NUMBER: KEI-P89-0703

WELL PERMIT NO.:

Flush-mounted Well Cover




A. Total Depth: 29'

B. Boring Diameter*: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 29'

Material: Schedule 40 PVC

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

E. Depth to Perforations: 5'

F. Perforated Length: 24'

Perforation Type: Machined Slot

Perforation Size: 0.020"

G. Surface Seal: 3'

Seal Material: Concrete

H. Seal: 1'

Seal Material: Bentonite

I. Gravel Pack: 25'

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.

KAPREALIAN ENGINEERING
INCORPORATED

| MAJOR DIVISIONS | | SYMBOLS | TYPICAL SOIL DESCRIPTIONS |
|---|---|---|---|
| GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size) | | GW | Well graded gravels or gravel - sand mixtures, little or no fines |
| | | GP | Poorly graded gravels or gravel - sand mixtures, little or no fines |
| | | GM | Silty gravels, gravel - sand - silt mixtures |
| | | GC | Clayey gravels, gravel - sand - clay mixtures |
| SANDS (More than 1/2 of coarse fraction < No. 4 sieve size) | | SW | Well graded sands or gravelly sands, little or no fines |
| | | SP | Poorly graded sands or gravelly sands, little or no fines |
| | | SM | Silty sands, sand - silt mixtures |
| | | SC | Clayey sands, sand - clay mixtures |
| SILTS & CLAYS LL < 50 | | ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity |
| | | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays |
| | | OL | Organic silts and organic silty clays of low plasticity |
| SILTS & CLAYS LL > 50 | | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts |
| | | CH | Inorganic clays of high plasticity, fat clays |
| | | OH | Organic clays of medium to high plasticity, organic silty clays, organic silts |
| HIGHLY ORGANIC SOILS | | Pt | Peat and other highly organic soils |
| DUAL (TRANSITION) SOILS | | | Soil characterisitics are transitional between the soil classifications listed above |

CLASSIFICATION CHART (Unified Soil Classification System)

# BORING LOG

| | | |
|---|---|---|
| **Project No.** KEI-P89-0703 | **Boring Diameter** 9" <br> **Casing Diameter** 2" | **Logged By** JGG <br> W.W. CEG 1633 |
| **Project Name** Unocal S/S #3538 <br> 411 West MacArthur Blvd., Oakland | **Well Cover Elevation** | **Date Drilled** 11/18/92 |
| **Boring No.** MW5 | **Drilling Method** Hollow-stem Auger | **Drilling Company** Woodward Drilling Co. |

| Penetration blows/6" | G. W. level | Depth (feet) Samples | Strati-graphy USCS | Description |
|---|---|---|---|---|
| | | 0 | | Six inches of concrete pavement over sand and gravel base. |
| 8/13/17 | | 5 | CL | Silty clay, estimated at 35% silt, moist, black, strong brown staining in pores. <br> Silty clay, estimated at 15% silt, 5% sand, and trace gravel to 3/8 inch in diameter, hard, moist, yellowish brown (10YR 5/4) and light brownish gray (10YR 6/2) mottled, trace pores. |
| 8/11/16 | | 10 | ML | Clayey silt, estimated at 15-20% clay and 5% fine-grained sand, very stiff, moist, pale yellow (2.5Y 7/3), trace pores. |
| 6/10/17 | | 15 | | Silt, estimated at 5-10% clay, very stiff, moist to very moist, pale yellow (2.5Y 7/3) with slight yellowish brown (10YR 5/6) mottling, trace sand and pores. <br> Silt, trace clay, hard, very moist, very pale brown (10YR 7/3) and strong brown (7.5YR 5/6) mottled, slightly micaceous. |
| 10/20/24 | | 20 | CL | Silty clay, estimated at 35-40% silt, hard, moist, very pale brown (10YR 5/4) mottled. |
| 8/13/25 | ▼ | | ML | Clayey silt, estimated at 15% clay and 5-10% sand, hard, very moist, pale yellow (2.5Y 7/3). |

# BORING LOG

| | | |
|---|---|---|
| **Project No.** KEI-P89-0703 | **Boring Diameter** 9" / **Casing Diameter** 2" | **Logged By** JGG W.W. CEG 1633 |
| **Project Name** Unocal S/S #3538 411 West MacArthur Blvd., Oakland | **Well Cover Elevation** | **Date Drilled** 11/18/92 |
| **Boring No.** MW5 | **Drilling Method** Hollow-stem Auger | **Drilling Company** Woodward Drilling Co. |

| Penetration blows/6" | G. W. level | Depth (feet) Samples | Stratigraphy USCS | Description |
|---|---|---|---|---|
| | | | ML | Clayey silt, estimated at 15% clay and 5-10% sand, hard, very moist, pale yellow (2.5Y 7/3). |
| 9/20/36 | | 25 | | Clayey silt, estimated at 20-25% clay and 5% sand, hard, moist, very pale brown (10YR 7/3). |
| | | | CL | Silty clay, estimated at 15-20% fine-grained silt and 5% sand, hard, moist, very pale brown (10YR 7/3), trace organic matter. |
| 13/19/28 | | 30 | | Silty clay, estimated at 15% silt, 5-10% sand, and trace gravel, hard, moist, very pale brown (10YR 7/3). |
| | | | | TOTAL DEPTH: 30' |
| | | 35 | | |
| | | 40 | | |

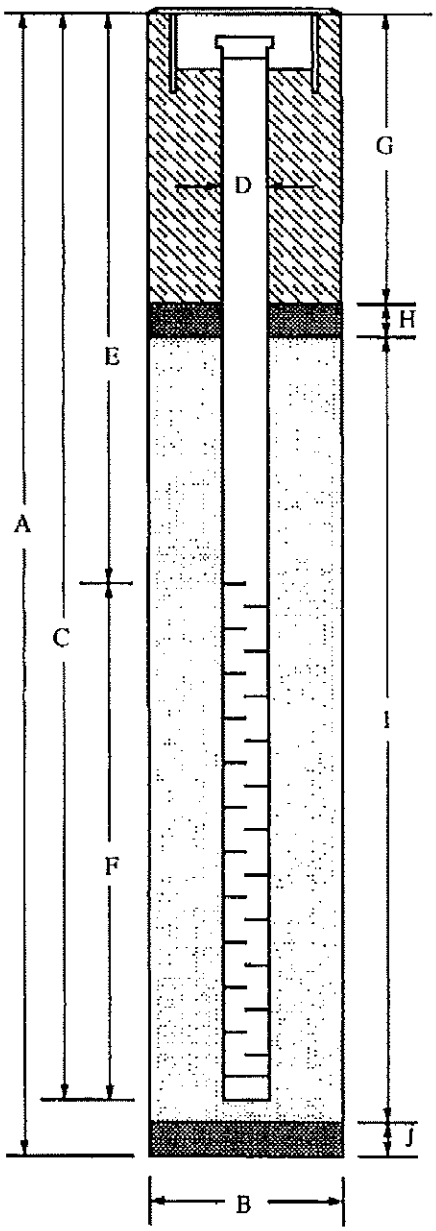
# WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal S/S #3538, 411 West MacArthur Blvd., Oakland WELL NO. MW5

PROJECT NUMBER: KEI-P89-0703

WELL PERMIT NO.: 91185

Flush-mounted Well Cover




A. Total Depth: 30'

B. Boring Diameter: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 30'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 13'

F. Perforated Length: 17'

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 9'

Seal Material: Neat Cement

H. Seal: 2'

Seal Material: Bentonite

I. Filter Pack: 19'

Pack Material: RMC Lonestar Sand

Size: 2/12

J. Bottom Seal: None

Seal Material: N/A

# BORING LOG

| | | |
|---|---|---|
| **Project No.** KEI-P89-0703 | **Boring Diameter** 9" <br> **Casing Diameter** 2" | **Logged By** JGG <br> W.W. CEG 1633 |
| **Project Name** Unocal S/S #3538 <br> 411 West MacArthur Blvd., Oakland | **Well Cover Elevation** | **Date Drilled** 11/18/92 |
| **Boring No.** MW6 | **Drilling Method** Hollow-stem Auger | **Drilling Company** Woodward Drilling Co. |

| Penetration blows/6" | G. W. level | Depth (feet) Samples | Strati-graphy USCS | Description |
|---|---|---|---|---|
| | | 0 | | Fifteen inches of asphalt pavement. |
| | | | | Silty clay, estimated at 20% silt and trace sand, moist, very dark gray. |
| 18/30/34 | | 5 | | Silty clay, estimated at 20-25% silt and 5% sand, hard, moist, greenish gray (5GY 5/1). |
| | | | | Silty clay with sand and gravel, estimated at 15-20% silt, 15% gravel to 2 inches in diameter, and 10-15% sand, hard, moist, greenish gray (5GY 5/1) with strong brown (7.5YR 4/6) staining. |
| | | | CL | |
| 19/23/35 | | 10 | | Silty clay, estimated at 15% silt and trace sand, hard, moist, greenish gray (5GY 6/1) with slight light yellowish brown (10YR 6/4) mottling. |
| 13/22/27 | | 15 | | Silty clay, estimated at 20% silt, hard, moist, light yellowish brown (10YR 6/4) with slight light gray (5Y 7/1) staining in pores, trace organic matter. |
| | | | | Clayey silt, estimated at 15% clay and 5-10% very fine-grained sand, hard, very moist, light yellowish brown (10YR 6/4). |
| 12/18/20 | ▼ | 20 | ML | |

# BORING LOG

| | | |
|---|---|---|
| **Project No.** KEI-P89-0703 | **Boring Diameter** 9" <br> **Casing Diameter** 2" | **Logged By** JGG <br> W.W. CEG1633 |
| **Project Name** Unocal S/S #3538 411 West MacArthur Blvd., Oakland | **Well Cover Elevation** | **Date Drilled** 11/18/92 |
| **Boring No.** MW6 | **Drilling Method** Hollow-stem Auger | **Drilling Company** Woodward Drilling Co. |

| Penetration blows/6" | G. W. level | Depth (feet) Samples | Strati-graphy USCS | Description |
|---|---|---|---|---|
| 7/10/13 | | 25 | ML | Clayey silt, estimated at 15% clay and trace sand, very stiff, very moist, light yellowish brown. |
| | | | CL | Silty clay, estimated at 20-30% slightly elastic silt, very stiff, moist, very pale brown. |
| 8/15/21 | | 30 | | Silty clay, estimated at 20-25% silt and trace gravel, hard, moist, light yellowish brown (10YR 6/4). |
| | | | | TOTAL DEPTH: 30' |
| | | 35 | | |
| | | 40 | | |

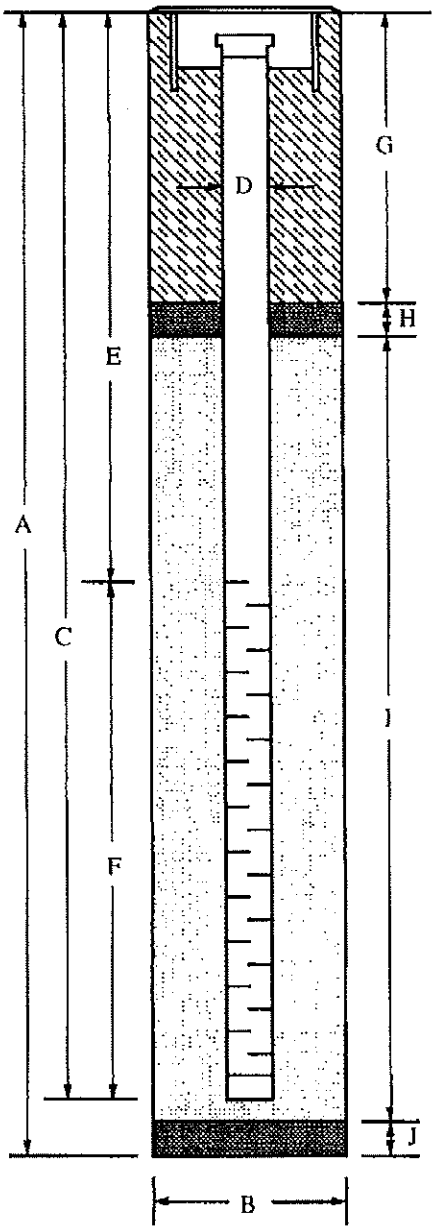
# WELL COMPLETION DIAGRAM

PROJECT NAME: Unocal S/S #3538, 411 West MacArthur Blvd., Oakland WELL NO. MW6

PROJECT NUMBER: KEI-P89-0703

WELL PERMIT NO.: 91185

Flush-mounted Well Cover




A. Total Depth : 30'

B. Boring Diameter: 9"

Drilling Method: Hollow Stem Auger

C. Casing Length: 30'

Material: Schedule 40 PVC

D. Casing Diameter: OD = 2.375"

ID = 2.067"

E. Depth to Perforations: 13'

F. Perforated Length: 17'

Perforation Type: Machined Slot

Perforation Size: 0.010"

G. Surface Seal: 9'

Seal Material: Neat Cement

H. Seal: 2'

Seal Material: Bentonite

I. Filter Pack: 19'

Pack Material: RMC Lonestar Sand

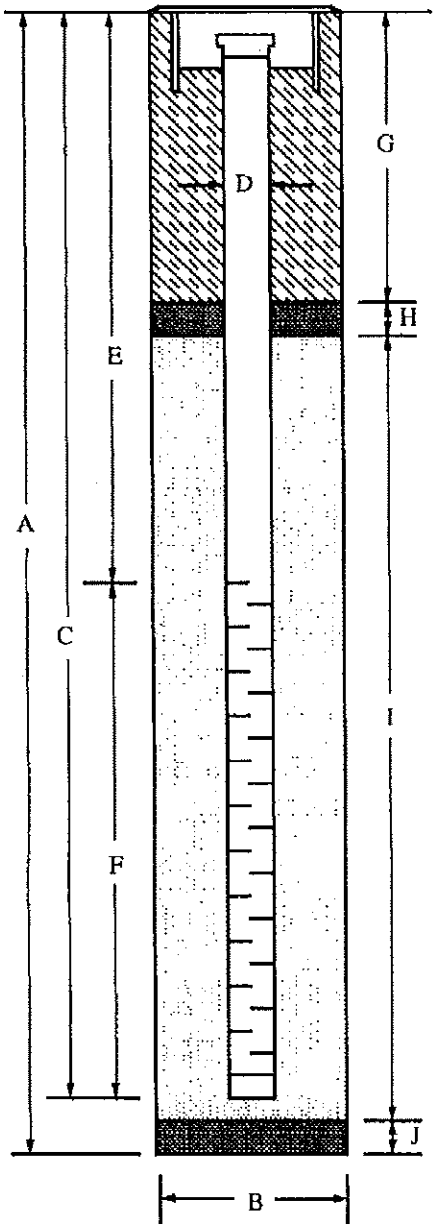
Size: 2/12

J. Bottom Seal: None

Seal Material: N/A

## WELL COMPLETION DIAGRAM
(SCHEMATIC)

Flush-mounted Well Cover




WELL DETAILS*

1. Well will be terminated 10 to 15 feet into the first encountered ground water, unless an aquitard five feet or greater in thickness is encountered below the water table, in which case the bottom of the boring will be backfilled with bentonite pellets and the well terminated at the top of this aquitard [A].

2. Boring diameter [B] is 8 inches for 2 inch wells, 10 inches for 4 inch wells, and 12 inches for 6 inch wells.

3. Perforated interval [F] will extend from bottom of casing to five feet above the first encountered ground water table (unless water <5 feet deep).

4. Schedule 40 PVC casing, 2 inch in diameter [D], will be used. Screen is 0.020 or 0.010 inch factory machined slots, depending on filter pack grain size.

5. Filter pack will be placed from bottom of casing to two feet above perforated interval [I]. (Bottom seal [J] is not installed unless required.) One to two feet of bentonite [H] will be placed above the filter pack. Concrete grout [G] will be placed from top of bentonite seal to the surface (unless modified due to shallow water). Blank casing [E] will extend from the top of the perforated casing to the top of the hole.

6. The well will be installed with a waterproof cap, padlock and a flush-mounted well cover.

* See text for additional information.

PROJECT NO.: 42-0142-09
LOCATION: 76 Station #3538
411 W. MacArthur Blvd.
Oakland, California

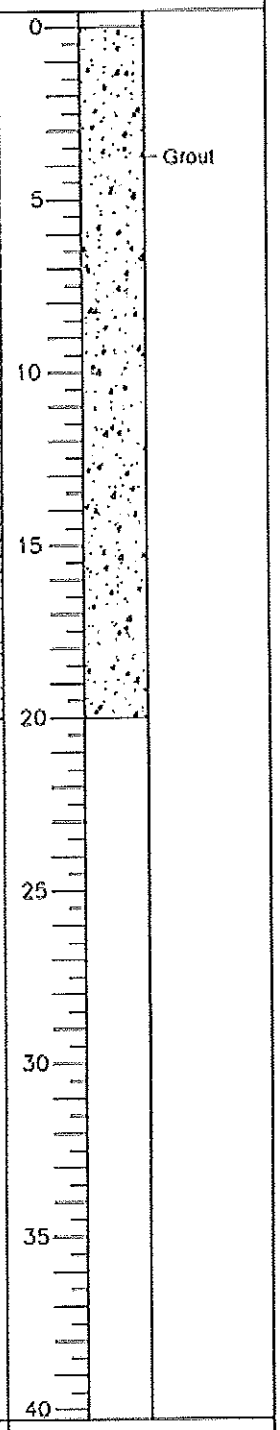
DATE DRILLED: 3/27/06
LOGGED BY: J. Kearns
APPROVED BY: K. Woodburne, RG
DRILLING CO.: Woodward Drilling

NORTHING: NOT SURVEYED
EASTING: NOT SURVEYED
ELEVATION: NOT SURVEYED

DRILLING METHOD: 2-inch Direct Push
SAMPLER TYPE: 4-foot Continuous Core
TOTAL DEPTH: 20.00 feet
DEPTH TO WATER: 16.25 feet

| PID/FID (ppm) | BLOWS PER 6 INCHES | RECOVERY | SAMPLE | DEPTH (feet below grade) | DESCRIPTION | USCS | LITHOLOGY |
|---|---|---|---|---|---|---|---|
| | | | | 0 | Asphalt concrete. | Asphalt | |
| 4.0 | | 3.0/3.0 | | 5 | CLAY (CL): Dark brown (10YR 3/3), 90% fines, 10% fine- to coarse-grained sand, medium plasticity, dry.<br>- @ 6': color change to black (2.5/2.5/1), moist. | CL | |
| 12.0 | | 4.0/4.0 | | 10 | - @ 9': color change to dark gray (5Y 4/1), 95% fines, 5% fine-grained sand.<br>- @ 10': color change to olive gray (5Y 5/2). | | |
| 0.2 | | 2.0/4.0 | | 15 | SAND (SW): Olive (5Y 4/3), 10% fines, 90% fine- to coarse-grained sand, loose, moist.<br>CLAY (CL): Light olive brown (2.5Y 5/6), 90% fines, 10% fine- to coarse-grained sand, medium plasticity, moist. | SW<br>CL | |
| 1.1 | | 4.0/4.0 | | 20 | SAND (SW): Dark grayish brown (2.5Y 4/2), 10% fines, 90% fine- to coarse-grained sand, loose, wet. | SW | |
| | | | | 25 | | | |
| | | | | 30 | | | |
| | | | | 35 | | | |
| | | | | 40 | | | |

BORING BACKFILL DETAIL




TRC

LOG OF EXPLORATORY BORING

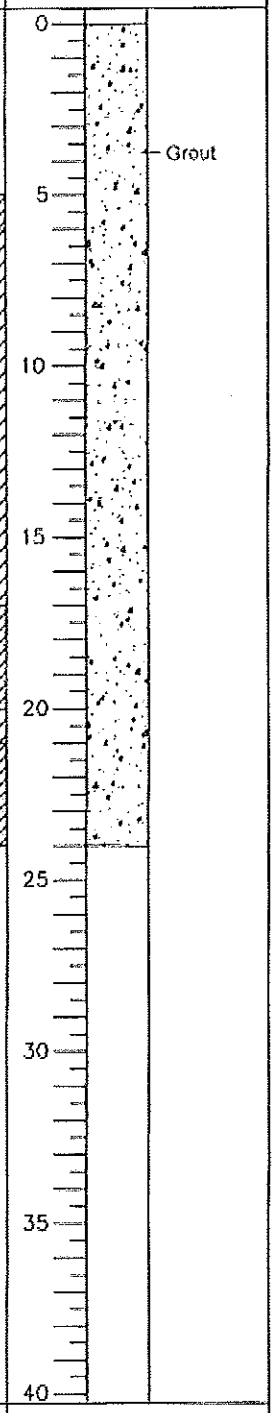
SB-1
PAGE 1 OF 1

| | | |
|---|---|---|
| PROJECT NO.: 42-0142-09 | DATE DRILLED: 3/27/06 | NORTHING: NOT SURVEYED |
| LOCATION: 76 Station #3538 | LOGGED BY: J. Kearns | EASTING: NOT SURVEYED |
| 411 W. MacArthur Blvd. | APPROVED BY: K. Woodburne, RG | ELEVATION: NOT SURVEYED |
| Oakland, California | DRILLING CO.: Woodward Drilling | |

DRILLING METHOD: 2-inch Direct Push
SAMPLER TYPE: 4-foot Continuous Core
TOTAL DEPTH: 24.00 feet
DEPTH TO WATER: 16.25 feet

| PID/FID (ppm) | BLOWS PER 6 INCHES | RECOVERY | SAMPLE | DEPTH (feet below grade) | DESCRIPTION | USCS | LITHOLOGY |
|---|---|---|---|---|---|---|---|
| | | | | 0 | | | |
| 1.8 | | 3.0/3.0 | | 5 | CLAYEY SAND (SC): Brown (10YR 4/3), 20% fines, 80% fine- to coarse-grained sand, loose, moist. | SC | |
| 0.2 | | 4.0/4.0 | | | CLAY (CL): Light olive brown (2.5Y 5/6), 90% fines, 10% fine- to coarse-grained sand, medium plasticity, moist.<br>- @ 9': color change to mottled light yellowish brown (2.5Y 6/3) and very dark gray (10YR 3/1).<br>- @ 11': color change to mottled brown (10YR 3/3) and very dark grayish brown (10YR 3/2). | CL | |
| 0.0 | | 4.0/4.0 | | 10 | | | |
| | | 2.0/2.0 | | 15 | CLAYEY SAND (SC): Yellowish brown (10YR 5/8), 30% fines, 72% fine- to coarse-grained sand, loose, dry. | SC | |
| | | 2.0/2.0 | | | | | |
| 0.0 | | 4.0/4.0 | | 20 | CLAY (CL): Yellowish brown (10YR 5/4), 90% fines, 10% fine- to coarse-grained sand, medium plasticity, wet. | CL | |
| | | | | | SAND (SC): 10% fines, 90% fine- to coarse-grained sand, loose. | SC | |
| | | | | 25 | | | |
| | | | | 30 | | | |
| | | | | 35 | | | |
| | | | | 40 | | | |

BORING BACKFILL DETAIL




TRC

# LOG OF EXPLORATORY BORING

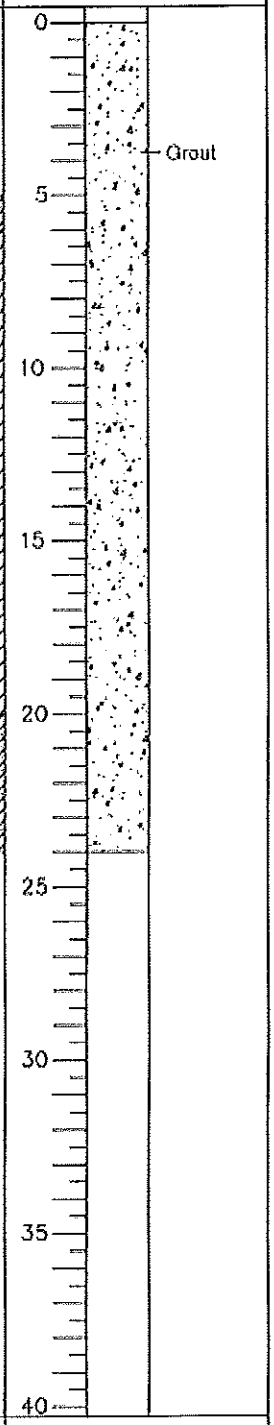
SB-2
PAGE 1 OF 1

| | | |
|---|---|---|
| PROJECT NO.: 42-0142-09 | DATE DRILLED: 3/27/06 | NORTHING: NOT SURVEYED |
| LOCATION: 76 Station #3538 | LOGGED BY: J. Kearns | EASTING: NOT SURVEYED |
| 411 W. MacArthur Blvd. | APPROVED BY: K. Woodburne, RG | ELEVATION: NOT SURVEYED |
| Oakland, California | DRILLING CO.: Woodward Drilling | |

DRILLING METHOD: 2-inch Direct Push
SAMPLER TYPE: 4-foot Continuous Core
TOTAL DEPTH: 24.00 feet
DEPTH TO WATER: 16.69 feet

| PID/FID (ppm) | BLOWS PER 6 INCHES | RECOVERY | SAMPLE | DEPTH (feet below grade) | DESCRIPTION | USCS | LITHOLOGY |
|---|---|---|---|---|---|---|---|
| | | | | 0 | | | |
| 13.3 | | 3.0/3.0 | | 5 | CLAYEY SAND (SC): Brown (10YR 3/3), 10% fines, 90% fine- to coarse-grained sand, loose, dry. | SC | |
| 6.9 | | 4.0/4.0 | | 10 | CLAY (CL): Dark brown (10YR 3/3), 90% fines, 10% fine- to coarse-grained sand, medium plasticity, moist.<br>- @ 9': color change to mottled light yellowish brown (10YR 4/4) and dark yellowish brown (10YR 4/6), high plasticity.<br>- @ 11': low plasticity. | CL | |
| 105 | | 2.5/4.0 | | 15 | - @ 14': hydrocarbon odor. | | |
| 1596 | | 3.0/4.0 | | | - @ 19': color change to mottled dusky red (10YR 3/2) and dark brown, hydrocarbon odor. | | |
| 0.0 | | 4.0/4.0 | | 20 | CLAYEY SAND (SC): Mottled dark greenish gray (GLEY1 6/1) and yellowish brown (10YR 5/6). | SC | |
| | | | | 25 | | | |
| | | | | 30 | | | |
| | | | | 35 | | | |
| | | | | 40 | | | |

BORING BACKFILL DETAIL




TRC

# LOG OF EXPLORATORY BORING

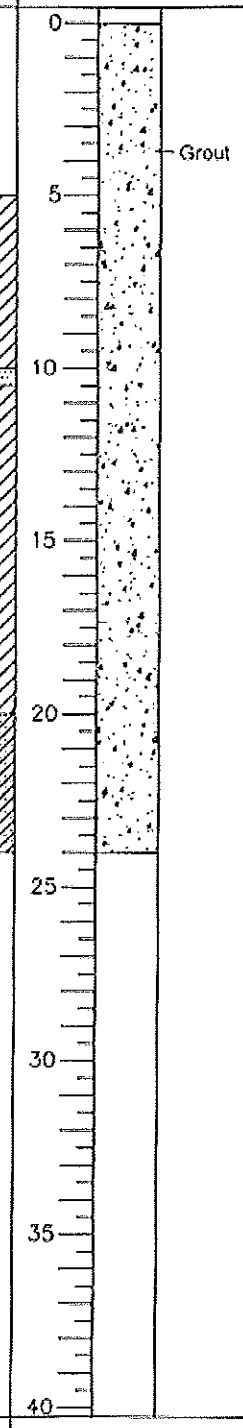
SB-3
PAGE 1 OF 1

| | | |
|---|---|---|
| PROJECT NO.: 42-0142-09 | DATE DRILLED: 3/28/06 | NORTHING: NOT SURVEYED |
| LOCATION: 76 Station #3538 | LOGGED BY: J. Kearns | EASTING: NOT SURVEYED |
| 411 W. MacArthur Blvd. | APPROVED BY: K. Woodburne, RG | ELEVATION: NOT SURVEYED |
| Oakland, California | DRILLING CO.: Woodward Drilling | |

DRILLING METHOD: 2-inch Direct Push
SAMPLER TYPE: 4-foot Continuous Core
TOTAL DEPTH: 24.00 feet
DEPTH TO WATER: 16.39 feet

| PID/FID (ppm) | BLOWS PER 6 INCHES | RECOVERY | SAMPLE | DEPTH (feet below grade) | DESCRIPTION | USCS | LITHOLOGY |
|---|---|---|---|---|---|---|---|
| | | | | 0 | | | |
| 8.3 | | 3.0/3.0 | | 5 | CLAY (CL): Mottled brown (10YR 4/3) and black (10YR 2/1), 90% fines, 10% fine- to coarse-grained sand, medium plasticity, moist. | CL | |
| 4.0 | | 3.5/4.0 | | | - @ 9': color change to mottled dark gray (5Y 4/1) and dark yellowish brown (10YR 3/4). | | |
| | | | | 10 | SAND (SW): Very pale brown (10YR 7/3), 5% fines, 95% fine- to coarse-grained sand, loose, dry. | SW | |
| 3.7 | | 2.5/4.0 | | | CLAY (CL): Brown (10YR 4/3), 90% fines, 10% fine- to coarse-grained sand, medium plasticity, moist.<br>- @ 12': color change to grayish brown (10YR 5/2).<br>- @ 14': color change to mottled pale brown (10YR 6/3) and yellowish brown (10YR 5/6). | CL | |
| 3.7 | | 2.0/4.0 | | 15 | | | |
| 2.7 | | 2.0/4.0 | | 20 | CLAYEY SAND (SC): Mottled pale brown (10YR 6/3) and yellowish brown (10YR 5/6), 15% fines, 85% fine- to medium-grained sand, wet. | SC | |
| | | | | 25 | | | |
| | | | | 30 | | | |
| | | | | 35 | | | |
| | | | | 40 | | | |

BORING BACKFILL DETAIL




TRC

# LOG OF EXPLORATORY BORING

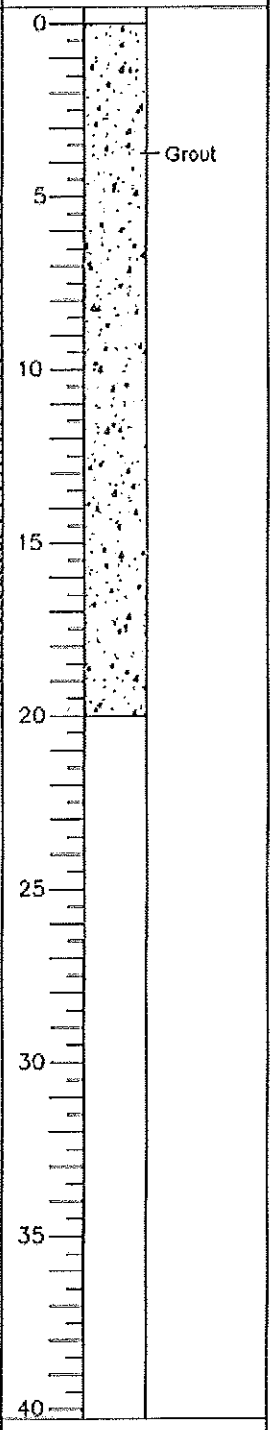
**SB-4**
PAGE 1 OF 1

| | | |
|---|---|---|
| PROJECT NO.: 42-0142-09 | DATE DRILLED: 3/28/06 | NORTHING: NOT SURVEYED |
| LOCATION: 76 Station #3538 | LOGGED BY: J. Kearns | EASTING: NOT SURVEYED |
| 411 W. MacArthur Blvd. | APPROVED BY: K. Woodburne, RG | ELEVATION: NOT SURVEYED |
| Oakland, California | DRILLING CO.: Woodward Drilling | |

DRILLING METHOD: 2-Inch Direct Push
SAMPLER TYPE: 4-foot Continuous Core
TOTAL DEPTH: 20.00 feet
DEPTH TO WATER: 18.00 feet

| PID/FID (ppm) | BLOWS PER 6 INCHES | RECOVERY | SAMPLE | DEPTH (feet below grade) | DESCRIPTION | USCS | LITHOLOGY |
|---|---|---|---|---|---|---|---|
| | | | | 0 | | | |
| 1.1 | | 3.0/3.0 | | 5 | CLAY (CL): Brown (10YR 4/3), 90% fines, 10% fine- to coarse-grained sand, medium plasticity, wet. | | |
| 2.4 | | 3.0/4.0 | | | - @ 9': color change to dark grayish brown (2.5Y 4/2). | CL | |
| | | | | 10 | - @ 10': color change to dark olive gray (5Y 3/2). | | |
| 1.8 | | 4.0/4.0 | | | CLAYEY SAND (SC): Dark olive gray (5Y 3/2), 15% fines, 85% fine- to coarse-grained sand, loose, wet. | SC | |
| | | | | | CLAY (CL): Mottled grayish brown (2.5Y 5/2) and dark yellowish brown (10YR 5/6), 90% fines, 10% fine- to medium- grained sand, wet. | CL | |
| | | | | 15 | CLAYEY SAND (SC): Mottled grayish brown (2.5Y 5/2) and dark yellowish brown (10YR 5/6), 15% fines, 85% fine- to medium-grained sand, wet. | | |
| 2.3 | | 3.0/4.0 | | | - @ 19': color change to greenish gray (GLEY1 5/5GY). | SC | |
| | | | | 20 | | | |
| | | | | 25 | | | |
| | | | | 30 | | | |
| | | | | 35 | | | |
| | | | | 40 | | | |

BORING BACKFILL DETAIL




TRC

# LOG OF EXPLORATORY BORING

SB-5
PAGE 1 OF 1

anteagroup

Project No: C103535061
Logged By: A. Buehler
Driller: Cascade Drilling
Drilling Method: Direct Push
Sampling Method: Acetate Liner
Casing Type: N/A
Slot Size: N/A
Gravel Pack: N/A

Client: ConocoPhillips
Location: Oakland, CA
Date Drilled: 12/20/10
Hole Diameter: 2"
Hole Depth: 20'
Well Diameter: N/A
Well Depth: N/A
First Water Depth:
Static Water Depth:

Elevation:
Northing:
Easting:

Boring/Well No: **SB-8**
Page 1 of 1

Site Address:
411 W. MacArthur Blvd, Oakland, CA

| Well Completion (Backfill / Casing) | Water Level | Moisture Content | PID Reading (ppm) | Sample Identification | Depth (feet) | Sample Recovery | Sample Interval | Soil Type | LITHOLOGY / DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|
| Neat Cement Grout | | | | | | | | | Air-knife clearance to 5 ft. |
| | | | 0.6 | SB-8 @5 | 5 | | | CL | brown/green mottled, sandy lean clay with gravel, 20% sand, 10% gravel, damp |
| | | | | | 7 | | | ML | Brown/black mottled, sandy silt, 30% sand, trace gravel, mild odor, damp |
| | | | 5.8 | SB-8 @10 | 10 | | | | |
| | | | | | 13 | | | GM | Brown/gray, silty gravel with sand, 10% silt, 30% gravel, moist |
| | | | 0.7 | SB-8 @15 | 15 | | | CL | Brown/gray, lean clay, 5% sand, moist |
| | | | | | 16 | | | GC | Brown, clayey gravel with sand, 10% clay, 20% sand, moist to wet |
| | | | | | 18 | | | ML | Brown/gray mottles, sandy silt, 30% sand, very dense, damp |
| | | | 440 | SB-8 @20 | 20 | | | | |
| | | | | | | | | | Total Depth = 20 ft |

| | | | | | |
|---|---|---|---|---|---|
| Project No: | 5697 | Client: | COP | Boring/Well No: **SB-9** | |
| Logged By: | A Buehler | Location: | Oakland | Page 1 of 2 | |
| Driller: | Cascade | Date Drilled: | 12/20/2010 | | |
| Drilling Method: | Direct Push | Hole Diameter: | 2 in | | |
| Sampling Method: | Acetate | Hole Depth: | 20 ft | | |
| Casing Type: | N/A | Well Diameter: | N/A | | |
| Slot Size: | N/A | Well Depth: | N/A | | |
| Gravel Pack: | N/A | ▼ First Water Depth: | | | |
| | | ▽ Static Water Depth: | | | |
| Elevation: | | Northing: | | Easting: | |

| Well Completion | Water Level | Moisture Content | PID Reading (ppm) | Sample Identification | Depth (feet) | Sample Recovery | Sample Interval | Soil Type | LITHOLOGY / DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1 | | | | Air-knife clearance to 5 ft |
| | | | | | 2 | | | | |
| | | | | | 3 | | | | |
| | | | | | 4 | | | | |
| | | | | | 5 | | | | |
| | | | 6.7 | SB-9 @5 | 6 | | | | Gray, gravelly lean clay, 20% gravel, moist, no odor |
| | | | | | 7 | | | ML | Brown/black mottled, sandy silt with gravel, 20% sand, 10% gravel |
| | | | | | 8 | | | | |
| | | | | | 9 | | | | |
| Backfill / Casing: Neat Cement Grout | | | 7.5 | SB-9 @10 | 10 | | | CL | Brown/gray mottled, gravelly lean clay, 10% gravel, moist, slight odor |
| | | | | | 11 | | | | |
| | | | | | 12 | | | SP | Dark brown, sand, fine sand, wet |
| | | | | | 13 | | | ML | Brown/orange/gray mottled, sandy silt, 40% sand, damp |
| | | | | | 14 | | | | |
| | | | 910 | SB-9 @15 | 15 | | | | |
| | ▼ | | | | 16 | | | | Dark brown/gray layered, sandy silt, 35% sand, saturated |
| | | | | | 17 | | | | |
| | | | | | 18 | | | | |
| | | | | | 19 | | | | |
| | | | 37 | SB-9 @20 | 20 | | | SM | Gray, Silty sand, fine sand, 25% silt, saturated |
| | | | | | 21 | | | | |
| | | | | | 22 | | | | |

Project No: C103535061
Logged By: A. Buehler
Driller: Cascade Drilling
Drilling Method: Direct Push
Sampling Method: Acetate Liner
Casing Type: N/A
Slot Size: N/A
Gravel Pack: N/A

Client: ConocoPhillips
Location: Oakland, CA
Date Drilled: 12/20/10
Hole Diameter: 2"
Hole Depth: 20'
Well Diameter: N/A
Well Depth: N/A
First Water Depth:
Static Water Depth:

Boring/Well No: **SB-9**
Page 2 of 2

Elevation:
Northing:
Easting:

| Well Completion (Backfill / Casing) | Water Level | Moisture Content | PID Reading (ppm) | Penetration (blows/6") | Depth (feet) | Sample Recovery | Sample Interval | Soil Type | LITHOLOGY / DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|
| Neat Cement Grout | | | | | 23 | | | | |
| | | | | | 24 | | | ML | Gray/green sandy silt, 30% sand, very dense, dry |
| | | | | | 25 | | | | |
| | | ▼ | 12.5 | SB-9 @25 | | | | | Same as above, saturated |
| | | | | | 26 | | | CL | Brown/gray mottled, lean clay, very dense, moist |
| | | | | | 27 | | | | |
| | | | | | 28 | | | | |
| | | | | | 29 | | | | |
| | | | 4.6 | SB-9 @30 | 30 | | | | Total Depth = 30 ft |
| | | | | | 31 | | | | |
| | | | | | 32 | | | | |
| | | | | | 33 | | | | |
| | | | | | 34 | | | | |
| | | | | | 35 | | | | |
| | | | | | 36 | | | | |
| | | | | | 37 | | | | |
| | | | | | 38 | | | | |
| | | | | | 39 | | | | |
| | | | | | 40 | | | | |
| | | | | | 41 | | | | |
| | | | | | 42 | | | | |
| | | | | | 43 | | | | |
| | | | | | 44 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Project No: | 5697 | Client: | COP | Boring/Well No: **SB-9** | |
| Logged By: | A Buehler | Location: | Oakland | Page 2 of | 2 |
| Driller: | Cascade | Date Drilled: | 12/21/2010 | | |
| Drilling Method: | Direct Push | Hole Diameter: | 2 in | | |
| Sampling Method: | Acetate | Hole Depth: | 20 ft | | |
| Casing Type: | N/A | Well Diameter: | N/A | | |
| Slot Size: | N/A | Well Depth: | N/A | | |
| Gravel Pack: | N/A | First Water Depth: | | | |
| | | Static Water Depth: | | | |
| Elevation: | | Northing: | | Easting: | |

| Well Completion: Backfill | Well Completion: Casing | Water Level | Moisture Content | PID Reading (ppm) | Sample Identification | Depth (feet) | Sample: Recovery | Sample: Interval | Soil Type | LITHOLOGY / DESCRIPTION |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | | | | Air-knife cleared to 5 ft |
| | | | | | | 2 | | | | |
| | | | | | | 3 | | | | |
| | | | | | | 4 | | | | |
| | | | | | | 5 | | | | |
| | | | | 0 | SB-10 @5 | 6 | | | CL | Brown, Gravelly lean clay with sand, 20% gravel, 10% sand, saturated |
| | | | | | | 7 | | | CL | Brown/gray/green layered sandy lean clay, 15% sand, moist, no odor |
| | | | | | | 8 | | | | |
| | | | | | | 9 | | | | |
| | | | | 0.5 | SB-10 @10 | 10 | | | | |
| | | | | | | 11 | | | | |
| | | | | | | 12 | | | SW | Brown, gravelly sand, 20% gravel, moist |
| | | | | | | 13 | | | | |
| | | | | | | 14 | | | CL | Brown/oraange/green mottled, sandy lean clay, 25% sand, dense |
| | | | | 0.6 | SB-10 @15 | 15 | | | ML | Brown/gray layered, sandy silt, 40% sand |
| | | | | | | 16 | | | | |
| | | | | | | 17 | | | | |
| | | | | | | 18 | | | | |
| | | | | | | 19 | | | | |
| Neat Cement Grout | | | | 9.3 | SB-10 @20 | 20 | | | | Gray, sandy silt, 40% sand, moist |
| | | | | | | 21 | | | | |
| | | | | | | 22 | | | GM | Brown, sandy silt with gravel, 25% sand, 40% gravel, moist |

anteagroup

Project No: C103535061
Logged By: A. Buehler
Driller: Cascade Drilling
Drilling Method: Direct Push
Sampling Method: Acetate Liner
Casing Type: N/A
Slot Size: N/A
Gravel Pack: N/A

Client: ConocoPhillips
Location: Oakland, CA
Date Drilled: 12/21/10
Hole Diameter: 2"
Hole Depth: 20'
Well Diameter: N/A
Well Depth: N/A
First Water Depth:
Static Water Depth:

Boring/Well No: **SB-10**
Page 2 of 2

Elevation:
Northing:
Easting:

| Well Completion: Backfill / Casing | Water Level | Moisture Content | PID Reading (ppm) | Penetration (blows/6") | Depth (feet) | Sample: Recovery / Interval | Soil Type | LITHOLOGY / DESCRIPTION |
|---|---|---|---|---|---|---|---|---|
| Neat Cement Grout | | | 0 | SB-10 @25 | 23–25 | | ML | Brown/gray, sandy silt, 40% sand, moist |
| | | | | | 25–26 | | SM | Brown silty sand, 50% sand, saturated |
| | | | | | 26–30 | | CL | Brown, sandy lean clay, 10% sand, moist, very dense |
| | | | 0 | SB-10 @30 | 30 | | | Total Depth = 30 ft |
| | | | | | 31–44 | | | |

EVERGREEN
BAPTIST
CHURCH

B

BP
STATION

DISPENSER ISLANDS
& CANOPIES

MW–6

WEST MACARTHUR BOULEVARD

MW–5

A

MW–4

MW–3

A'

SB–4

SB–3

RESIDENTIAL
419/421
WEST
MACARTHUR

FORMER
DISPENSER
ISLANDS

FORMER UST

FORMER UST

STATION
BUILDING

MW–1

CANOPY

SHED

MW–2

SB–2

SB–5

PLAYGROUND

FORMER
WASTE OIL UST

SHED

WEBSTER STREET

LOT

SB–1

RESIDENTIAL
430
37TH
STREET

RESIDENTIAL
428
37TH
STREET

RESIDENTIAL
424
37TH
STREET

RESIDENTIAL
420
37TH
STREET

RESIDENTIAL
416
37TH
STREET

RESIDENTIAL
412
37TH
STREET

RESIDENTIAL
402
37TH
STREET

B

LEGEND

Approximate property line

Groundwater monitoring well

Soil Boring by TRC, March 2006

N

0 30 FT

SCALE

SOURCE: Site plan by Gettler–Ryan, August 2000.

# FIGURE 2
## SITE PLAN

FORMER 76 STATION 3538
411 WEST MACARTUR BOULEVARD
OAKLAND, CALIFORNIA

| PROJECT NO. | PREPARED BY | DRAWN BY |
|---|---|---|
| C103538 | NP | JH |
| DATE | REVIEWED BY | FILE NAME |
| 10/22/08 | TP | 76–3538 |

DELTA®

NORTHEAST

B

SOUTHWEST

B'

MW-4 SB-4 MW-3 SB-3 SB-2 MW-5

0 5 10 15 20 25 30

31,ND,NA
<0.93,<0.0047,<0.0047
17,ND,NA
20,ND,NA
<0.92,<0.0046,<0.0046
2.1,ND,NA
9/07 Q
ND<50/ND<0.3/ND<1
ND<50/ND<0.50/3.4
1.3,ND,NA
1.3,0.29,NA
3.3,ND,NA
3/08 Q
ND<50/ND<0.3/19
ND,ND,NA
1.3,0.64,0.11
6400,<9.7,<9.7
13000/340/510
ND<0.97,ND<0.0049,ND<0.0049
ND<0.93,ND<0.0047,ND<0.0047
ND<50/ND<0.50/ND<0.50
ND,ND,NA
ND,ND,NA
ND,ND,NA
ND,ND,NA
9/07 Q
ND<50/ND<0.3/ND<1

## LEGEND

MW-7 — MONITORING WELL/BORING NAME

WELL CASING/EXPLORATORY BORING

SOIL SAMPLE LOCATION

WELL SCREEN

6400,<9.7,<9.7 — SOIL SAMPLE LOCATION WITH ANALYTICAL DATA: TPHg, BENZENE, MTBE (mg/kg)

120/130/11 — GROUNDWATER SAMPLE LOCATION WITH ANALYTICAL DATA: TPHg, BENZENE, MTBE (ug/L)

(3/08 Q) — MONITORING WELL QUARTERLY GROUNDWATER SAMPLE DATE

DEPTH TO FIRST ENCOUNTERED GROUNDWATER

DEPTH TO STATIC GROUNDWATER

LOW PERMEABILITY
SILT (ML), CLAY (CL)

MEDIUM PERMEABILITY
CLAYEY SAND (SC), CLAYEY GRAVEL (GC)

HIGH PERMEABILITY WITH
WELL GRADED GRAVEL (SP, SW)

APPROXIMATE STRATIGRAPHIC BOUNDARY

NOTES:

1) ND<50=NOT DETECTED AT LABORATORY DETECTION LIMIT
NA=NOT ANALYZED
TPHg=TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
MTBE=METHYL TERT BUTYL ETHER
mg/kg=MILLIGRAMS PER KILOGRAM
ug/L=MICROGRAMS PER LITER

2) STRATIGRAPHY BETWEEN BORINGS IS INTERPRETIVE.

3) GROUNDWATER SAMPLES FROM BORINGS WERE COLLECTED ON THE DRILLING DATE.

0 40
SCALE IN FEET

# FIGURE 4
## GEOLOGIC CROSS SECTION A–A'

## FORMER 76 SERVICE STATION #3538
## 411 WEST MACARTHUR BOULEVARD
## OAKLAND, CALIFORNIA

| PROJECT NO. | PREPARED BY | DRAWN BY |
|---|---|---|
| C103538 | NP | JH |
| DATE | REVIEWED BY | FILE NAME |
| 10/22/08 | DD | 3538-CrosA |

DELTA®

NORTHEAST

B

SOUTHWEST

B'

MW-6

SB-3

MW-2

SB-1

0

5

10

15

20

25

30

31

NA,ND,NA

NA,ND,NA

NA,ND,NA

9/07 Q
ND<50/ND<0.3/ND<1

NA,ND,NA

1.4,ND,NA

ND,ND,NA

1.3,0.64,0.11

6400,<9.7,<9.7

1.8,ND,NA

13,1.5,NA

(3/08 Q)
ND<50/1.8/1.3

13000/340/510

<0.97,<0.0049,<0.0049

2.8,<0.0048,<0.0048

120/130/11

?

?

?

0

40

SCALE IN FEET

5

## LEGEND

MW-7

MONITORING WELL/BORING NAME

WELL CASING/EXPLORATORY BORING

SOIL SAMPLE LOCATION

WELL SCREEN

6400,<9.7,<9.7 — SOIL SAMPLE LOCATION WITH ANALYTICAL DATA: TPHg, BENZENE, MTBE (mg/kg)

120/130/11 — GROUNDWATER SAMPLE LOCATION WITH ANALYTICAL DATA: TPHg, BENZENE, MTBE (ug/L)

(3/08 Q) — MONITORING WELL QUARTERLY GROUNDWATER SAMPLE DATE

DEPTH TO FIRST ENCOUNTERED GROUNDWATER

DEPTH TO STATIC GROUNDWATER

LOW PERMEABILITY
SILT (ML), CLAY (CL)

MEDIUM PERMEABILITY
CLAYEY SAND (SC), CLAYEY GRAVEL (GC)

HIGH PERMEABILITY WITH
WELL GRADED GRAVEL (SP, SW)

APPROXIMATE STRATIGRAPHIC BOUNDARY

NOTES:

1) ND<50=NOT DETECTED AT LABORATORY DETECTION LIMIT
NA=NOT ANALYZED
TPHg=TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
MTBE=METHYL TERT BUTYL ETHER
mg/kg=MILLIGRAMS PER KILOGRAM
ug/L=MICROGRAMS PER LITER

2) STRATIGRAPHY BETWEEN BORINGS IS INTERPRETIVE.

3) GROUNDWATER SAMPLES FROM BORINGS WERE COLLECTED ON THE DRILLING DATE.

# FIGURE 5
## GEOLOGIC CROSS SECTION B–B'

## FORMER 76 SERVICE STATION #3538
## 411 WEST MACARTHUR BOULEVARD
## OAKLAND, CALIFORNIA

| PROJECT NO. | PREPARED BY | DRAWN BY |
|---|---|---|
| C103538 | NP | JH |
| DATE | REVIEWED BY | FILE NAME |
| 10/21/08 | DD | 3538-CrosB |

DELTA®

**Table 3**
Historical Soil Analytical Results
Former 76 Service Station No. 3538
411 W. MacArthur Blvd
Oakland, CA

| Sample ID | Date | Depth (ft) | TPHg (mg/kg) | TPHd (mg/kg) | Benzene (mg/kg) | Toluene (mg/kg) | Ethylbenzene (mg/kg) | Total Xylenes (mg/kg) | MTBE (mg/kg) | TBA (mg/kg) | TAME (mg/kg) | DIPE (mg/kg) | ETBE (mg/kg) | EDB (mg/kg) | 1-2,DCA (mg/kg) | Ethanol (mg/kg) | TOG (mg/kg) | Lead (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SW-1 | 6/12/1989 | 10 | **3100** | -- | **12** | **300** | **730** | **110** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SW-1 (4) | 6/12/1989 | 10 | <1.0 | -- | <0.050 | <0.10 | <0.10 | <0.10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SW2 | 6/12/1989 | 10 | **1.1** | -- | **0.1** | <0.10 | **0.18** | <0.10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SW3 | 6/12/1989 | 10 | **5.7** | -- | **0.26** | <0.10 | **0.45** | **0.23** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SW4 | 6/12/1989 | 10 | **2.5** | -- | <0.050 | <0.10 | **0.24** | <0.10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| SW4 (2) | 6/12/1989 | 10 | **11** | -- | **0.61** | **0.51** | **1.3** | **0.44** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| P1 | 6/12/1989 | 6.5 | <1.0 | -- | <0.050 | <0.10 | <0.10 | <0.10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| P2 | 6/12/1989 | 6.5 | <1.0 | -- | <0.050 | <0.10 | <0.10 | <0.10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| P3 | 6/12/1989 | 5.5 | <1.0 | -- | <0.050 | <0.10 | <0.10 | <0.10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| P4 | 6/12/1989 | 10 | **170** | -- | **0.71** | **12** | **47** | **6.8** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| WO1 | 6/12/1989 | 8.5 | <1.0 | -- | <0.050 | <0.10 | <0.10 | <0.10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | | | | | | | | | | | | | |
| MW-1 (5) | 9/6/1989 | 5 | **3.4** | <1.0 | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | <5.0 | -- | <50 | -- |
| MW1 (10) | 9/6/1989 | 10 | **5** | <1.0 | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | <5.0 | -- | <50 | -- |
| MW1 (15) | 9/6/1989 | 15 | **2.2** | <1.0 | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | <5.0 | -- | <50 | -- |
| MW1 (19) | 9/6/1989 | 19 | <1.0 | <1.0 | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | <5.0 | -- | <50 | -- |
| MW2 (5) | 9/6/1989 | 5 | **1.4** | -- | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW2 (10) | 9/6/1989 | 10 | <1.0 | -- | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW2 (15) | 9/6/1989 | 15 | **1.8** | -- | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW2 (19) | 9/6/1989 | 19 | **13** | -- | **1.5** | **2.1** | **0.34** | **1.8** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW3 (5) | 9/6/1989 | 5 | **1.3** | -- | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW3 (10) | 9/6/1989 | 10 | **1.8** | -- | **0.29** | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW3 (15) | 9/6/1989 | 15 | **3.3** | -- | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW3 (18.5) | 9/6/1989 | 18.5 | <1.0 | -- | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW4 (5) | 9/6/1989 | 5 | **3.1** | -- | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW4 (10) | 9/6/1989 | 10 | **17** | -- | <0.050 | <0.010 | <0.010 | **0.1** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW4 (15) | 9/6/1989 | 15 | **20** | -- | <0.050 | <0.010 | <0.010 | **0.27** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW4 (18.5) | 9/6/1989 | 18.5 | **2.1** | -- | <0.050 | <0.010 | <0.010 | <0.010 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | | | | | | | | | | | | | |
| MW5 (5) | 11/18/1992 | 5 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW5 (10) | 11/18/1992 | 10 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW5 (15) | 11/18/1992 | 15 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW5 (21) | 11/18/1992 | 21 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW6 (5) | 11/18/1992 | 5 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW6 (10) | 11/18/1992 | 10 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW6 (15) | 11/18/1992 | 15 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW6 (19.5) | 11/18/1992 | 19.5 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | | | | | | | | | | | | | |
| A1 (19) | 9/14/1998 | 19 | **3.5** | -- | **0.53** | **0.36** | **0.069** | **0.40** | <0.050 | -- | -- | -- | -- | -- | -- | -- | -- | **26** |
| A2 (18) | 9/14/1998 | 18 | **12** | -- | **0.050** | **0.075** | <0.0050 | **0.026** | <0.050 | -- | -- | -- | -- | -- | -- | -- | -- | <1.0 |
| B1 (19.5) | 9/14/1998 | 19.5 | **360** | -- | **1.5** | **15** | **7.0** | **44** | <0.050 | -- | -- | -- | -- | -- | -- | -- | -- | **1.7** |
| B2 (19.5) | 9/14/1998 | 19.5 | **6.7** | -- | **0.017** | **1.8** | **0.24** | **1.4** | <0.050 | -- | -- | -- | -- | -- | -- | -- | -- | **2.7** |
| P1 (6) | 9/14/1998 | 6 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.050 | -- | -- | -- | -- | -- | -- | -- | -- | **11** |
| P2 (6) | 9/14/1998 | 6 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.050 | -- | -- | -- | -- | -- | -- | -- | -- | **1.3** |
| P3 (6) | 9/14/1998 | 6 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.050 | -- | -- | -- | -- | -- | -- | -- | -- | <1.0 |
| P4 (6) | 9/14/1998 | 6 | <1.0 | -- | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.050 | -- | -- | -- | -- | -- | -- | -- | -- | <1.0 |

**Table 3**
Historical Soil Analytical Results
Former 76 Service Station No. 3538
411 W. MacArthur Blvd
Oakland, CA

| Sample ID | Date | Depth (ft) | TPHg (mg/kg) | TPHd (mg/kg) | Benzene (mg/kg) | Toluene (mg/kg) | Ethylbenzene (mg/kg) | Total Xylenes (mg/kg) | MTBE (mg/kg) | TBA (mg/kg) | TAME (mg/kg) | DIPE (mg/kg) | ETBE (mg/kg) | EDB (mg/kg) | 1-2,DCA (mg/kg) | Ethanol (mg/kg) | TOG (mg/kg) | Lead (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-1@5 | 3/27/2006 | 5 | <0.97 | -- | <0.0049 | <0.0049 | <0.0049 | <0.0097 | <0.0049 | <0.0097 | <0.0049 | <0.0049 | <0.0049 | <0.0049 | <0.0049 | <0.49 | -- | -- |
| SB-1@9 | 3/27/2006 | 9 | **2.8** | -- | <0.0048 | <0.0048 | <0.0048 | <0.0097 | <0.0048 | <0.0097 | <0.0048 | <0.0048 | <0.0048 | <0.0048 | <0.0048 | <0.48 | -- | -- |
| SB-2@5 | 3/27/2006 | 5 | <0.97 | -- | <0.0049 | <0.0049 | <0.0049 | <0.0097 | <0.0049 | <0.0097 | <0.0049 | <0.0049 | <0.0049 | <0.0049 | <0.0049 | <0.49 | -- | -- |
| SB-2@9 | 3/27/2006 | 9 | <0.93 | -- | <0.0047 | <0.0047 | <0.0047 | <0.0093 | <0.0047 | <0.0093 | <0.0047 | <0.0047 | <0.0047 | <0.0047 | <0.0047 | <0.47 | -- | -- |
| SB-3@14 | 3/27/2006 | 14 | **1.3** | -- | **0.11** | <0.0046 | **0.061** | **0.055** | **0.64** | **0.19** | <0.0046 | <0.0046 | <0.0046 | <0.0046 | <0.0046 | <0.46 | -- | -- |
| SB-3@16 | 3/27/2006 | 16 | **6100** | -- | <9.7 | **53** | **86** | **420** | <9.7 | <19 | <9.7 | <9.7 | <9.7 | <9.7 | <9.7 | <190 | -- | -- |
| SB-4@5 | 3/27/2006 | 5 | <0.93 | -- | <0.0047 | <0.0047 | <0.0047 | <0.0093 | <0.0047 | <0.0093 | <0.0047 | <0.0047 | <0.0047 | <0.0047 | <0.0047 | <0.47 | -- | -- |
| SB-4@15 | 3/27/2006 | 15 | <0.92 | -- | <0.0046 | <0.0046 | <0.0046 | <0.0092 | <0.0046 | <0.0092 | <0.0046 | <0.0046 | <0.0046 | <0.0046 | <0.0046 | <0.46 | -- | -- |
| SB-5@9 | 3/27/2006 | 9 | <0.93 | -- | <0.0046 | <0.0046 | <0.0046 | <0.0093 | <0.0046 | <0.0093 | <0.0046 | <0.0046 | <0.0046 | <0.0046 | <0.0046 | <0.46 | -- | -- |
| SB-5@13 | 3/27/2006 | 13 | <0.93 | -- | <0.0047 | <0.0047 | <0.0047 | <0.0093 | <0.0047 | <0.0093 | <0.0047 | <0.0047 | <0.0047 | <0.0047 | <0.0047 | <0.47 | -- | -- |
| | | | | | | | | | | | | | | | | | | |
| SB-8@5 | 12/20/10 | 5 | <0.20 | -- | <0.0050 | <0.0050 | <0.0050 | <0.010 | <0.0050 | <0.050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <1.0 | -- | -- |
| SB-8@10 | 12/20/10 | 10 | **0.30** | -- | <0.0050 | <0.0050 | <0.0050 | <0.010 | <0.0050 | <0.050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <1.0 | -- | -- |
| SB-8@15 | 12/20/10 | 15 | <10 | -- | <0.025 | <0.025 | <0.025 | <0.050 | <0.025 | <0.25 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <5.0 | -- | -- |
| SB-8@20 | 12/20/10 | 20 | **520** | -- | <1.2 | **19** | **19** | **86** | <1.2 | <12 | <1.2 | <1.2 | <1.2 | <1.2 | <1.2 | <250 | -- | -- |
| SB-9@5 | 12/20/10 | 5 | **9.9** | -- | <0.025 | <0.025 | **0.10** | **0.059** | <0.025 | <0.25 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <5.0 | -- | -- |
| SB-9@10 | 12/20/10 | 10 | **3.0** | -- | <0.0050 | **0.011** | **0.069** | **0.28** | **0.014** | **0.40** | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <1.0 | -- | -- |
| SB-9@15 | 12/20/10 | 15 | <10 | -- | **1.4** | **0.28** | **0.14** | **0.66** | **0.04** | <0.25 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <5.0 | -- | -- |
| SB-9@20 | 12/20/10 | 20 | **4.5** | -- | **0.17** | **0.10** | **0.067** | **0.37** | **0.62** | **0.58** | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <5.0 | -- | -- |
| SB-9@25 | 12/20/10 | 25 | **0.30** | -- | <0.0050 | **0.014** | **0.0050** | **0.028** | <0.0050 | <0.050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <1.0 | -- | -- |
| SB-9@30 | 12/20/10 | 30 | **0.28** | -- | <0.0050 | **0.02** | **0.011** | **0.043** | <0.0050 | <0.050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <1.0 | -- | -- |
| SB-10@5 | 12/21/10 | 5 | <0.20 | -- | <0.0050 | <0.0050 | <0.0050 | <0.010 | <0.0050 | <0.050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <1.0 | -- | -- |
| SB-10@10 | 12/21/10 | 10 | **0.28** | -- | <0.0050 | <0.0050 | <0.0050 | **0.017** | <0.0050 | <0.050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <1.0 | -- | -- |
| SB-10@15 | 12/21/10 | 15 | **0.47** | -- | <0.0050 | <0.0050 | **0.0055** | **0.024** | <0.0050 | <0.050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <1.0 | -- | -- |
| SB-10@20 | 12/21/10 | 20 | **0.31** | -- | <0.0050 | <0.0050 | **0.047** | <0.010 | <0.0050 | <0.050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <1.0 | -- | -- |
| SB-10@25 | 12/21/10 | 25 | <0.20 | -- | <0.0050 | <0.0050 | <0.0050 | <0.010 | <0.0050 | <0.050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <1.0 | -- | -- |
| SB-10@30 | 12/21/10 | 30 | <0.20 | -- | <0.0050 | <0.0050 | <0.0050 | **0.012** | <0.0050 | <0.050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <1.0 | -- | -- |

TPHg = total petroleum hydrocarbons as gasoline  TPHd = total petroleum hydrocarbons as diesel  MTBE = metyl tert butyl ether  TBA = tert butyl alcohol  TAME = tert amyl methyl ether  DIPE = diisopropyl ether
ETBE = ethyl tert butyl ether  EDB = ethylene dibromide  1,2-DCA = 1,2 dicholorethane  TOG = total oil and grease  **bold** = value above reporting limit  mg/kg = milligrams per kilogram

**TABLE 1**

**GROUNDWATER MONITORING AND SAMPLING DATA**
**UNOCAL No. 3538 (351642)**
**411 W MACARTHUR BLVD**
**OAKLAND, CALIFORNIA**

| | | | | | HYDROCARBONS | PRIMARY VOCS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Date | TOC | DTW | GWE | TPH Gasoline | Benzene | Toluene | Ethylbenzene | Total Xylene | MTBE by SW8021 | Ethanol | EDB | EDC |
| | Units | ft | ft | ft-amsl | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| | Environmental Screening Level (ESL)[1] | | | | 100 | 1 | 40 | 30 | 20 | 5 | -- | -- | -- |
| MW-1 | screened from 5 to 29 feet bgs | | | | | | | | | | | | |
| | 9/15/1989 | -- | -- | -- | ND | ND | **0.61** | ND | ND | -- | -- | -- | -- |
| | 1/23/1990 | -- | -- | -- | ND | **1.5** | **2.3** | ND | **4.3** | -- | -- | -- | -- |
| | 4/19/1990 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 7/17/1990 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 10/16/1990 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 1/15/1991 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 4/12/1991 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 7/15/1991 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 7/14/1992 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 4/13/1993 | 72.43 | 17.70 | 54.73 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/14/1993 | 72.43 | 18.49 | 53.94 | ND | **2.2** | **2.1** | **1.1** | **6.2** | -- | -- | -- | -- |
| | 10/14/1993 | 72.10 | 18.32 | 53.78 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 1/12/1994 | 72.10 | 18.18 | 53.92 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 4/11/1994 | 72.10 | 17.80 | 54.30 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/7/1994 | 72.10 | 18.28 | 53.82 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 10/5/1994 | 72.10 | 18.55 | 53.55 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 1/9/1995 | 72.10 | 17.90 | 54.20 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 4/17/1995 | 72.10 | 17.22 | 54.88 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/19/1995 | 72.10 | 18.03 | 54.07 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 10/26/1995 | 72.10 | 18.67 | 53.43 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 1/16/1996 | 72.10 | 17.20 | 54.90 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 4/15/1996 | 72.10 | 17.40 | 54.70 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/11/1996 | 72.10 | 18.03 | 54.07 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/17/1997 | 72.10 | 16.54 | 55.56 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/21/1997 | 72.10 | 18.16 | 53.94 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/14/1998 | 72.10 | 16.05 | 56.05 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/6/1998 | 72.10 | 16.46 | 55.64 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/13/1999 | 72.10 | 17.37 | 54.73 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 8/31/1999 | 72.12 | 17.00 | 55.12 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/21/2000 | 72.12 | 17.04 | 55.08 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/10/2000 | 72.12 | 18.10 | 54.02 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/4/2001 | 72.12 | 17.95 | 54.17 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/16/2001 | 72.12 | 18.03 | 54.09 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/28/2002 | 72.12 | 17.31 | 54.81 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/12/2002 | 72.12 | 18.15 | 53.97 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <2.5 | -- | -- | -- |
| | 1/14/2003 | 72.12 | 17.66 | 54.46 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/10/2003 | 72.12 | 17.86 | 54.26 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <2.0 | -- | -- | -- |
| | 2/4/2004 | 72.12 | 17.43 | 54.69 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/29/2004 | 72.12 | 18.12 | 54.00 | <50 | <0.30 | 0.38 | <0.30 | <0.6 | <1 | -- | -- | -- |
| | 3/2/2005 | 72.12 | 16.15 | 55.97 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/30/2005 | 72.12 | 18.04 | 54.08 | <50 | <0.30 | <0.30 | <0.30 | <0.6 | <1.0 | -- | -- | -- |
| | 3/23/2006 | 72.12 | -- | -- | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/26/2006 | 72.12 | 17.90 | 54.22 | <50 | <0.30 | <0.30 | <0.30 | <0.6 | <1.0 | -- | -- | -- |
| | 3/15/2007 | 72.12 | 17.22 | 54.90 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/27/2007 | 72.12 | 18.49 | 53.63 | <50 | <0.30 | <0.30 | <0.30 | <0.6 | <1.0 | -- | -- | -- |
| | 3/27/2008 | 72.12 | 17.57 | 54.55 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/17/2008 | 72.12 | 18.20 | 53.92 | <50 | <0.30 | <0.30 | <0.30 | <0.6 | <1.0 | -- | -- | -- |
| | 3/27/2009 | 72.12 | 16.75 | 55.37 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/17/2009 | 72.12 | 18.18 | 53.94 | <50 | <0.30 | <0.30 | <0.30 | <0.6 | <1.0 | -- | -- | -- |
| | 3/23/2010 | 72.12 | 17.34 | 54.78 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/21/2010 | 72.12 | 18.74 | 53.38 | <50 | <0.30 | <0.30 | <0.30 | <0.6 | <1.0 | -- | -- | -- |
| | 3/30/2011 | 72.12 | 16.68 | 55.44 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 09/06/2011 | 72.12 | 18.36 | 53.76 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | <0.50 | -- |
| | 02/03/2012 | 72.12 | 18.02 | 54.10 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 08/17/2012 | 72.12 | 18.50 | 53.62 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | <250 | <0.50 | <0.50 |
| | 2/14/2013 | 72.12 | 17.98 | 54.14 | Sampled Annually in the Third Quarter | | | | | | | | |
| MW-2 | screened from 3.5 to 28.5 feet bgs | | | | | | | | | | | | |
| | 9/15/1989 | -- | -- | -- | 290 | ND | **12** | ND | ND | -- | -- | -- | -- |
| | 1/23/1990 | -- | -- | -- | 400 | **73** | **36** | **10** | **40** | -- | -- | -- | -- |
| | 4/19/1990 | -- | -- | -- | 3900 | **550** | **5.1** | **91** | **390** | -- | -- | -- | -- |
| | 7/17/1990 | -- | -- | -- | 490 | **76** | **0.59** | **11** | **46** | -- | -- | -- | -- |
| | 10/16/1990 | -- | -- | -- | 1400 | **430** | **2.0** | **48** | **240** | -- | -- | -- | -- |
| | 1/15/1991 | -- | -- | -- | 680 | **170** | **0.7** | **19** | **81** | -- | -- | -- | -- |
| | 4/12/1991 | -- | -- | -- | 2200 | **160** | **4.3** | **23** | **62** | -- | -- | -- | -- |
| | 7/15/1991 | -- | -- | -- | 2200 | **770** | **12** | **72** | **370** | -- | -- | -- | -- |
| | 10/15/1991 | -- | -- | -- | 140 | **44** | **0.56** | **1.5** | **12** | -- | -- | -- | -- |
| | 1/15/1992 | -- | -- | -- | 220 | **37** | **0.52** | **1.1** | **7** | -- | -- | -- | -- |
| | 4/14/1992 | -- | -- | -- | 150 | **6.2** | ND | ND | **1.4** | -- | -- | -- | -- |
| | 7/14/1992 | -- | -- | -- | 130 | **3.7** | ND | ND | ND | -- | -- | -- | -- |
| | 10/12/1992 | -- | -- | -- | 370 | **3.4** | **0.56** | ND | **11** | -- | -- | -- | -- |
| | 1/8/1993 | -- | -- | -- | 510 | ND | ND | ND | ND | -- | -- | -- | -- |
| | 4/13/1993 | 71.63 | 17.86 | 53.77 | 410 | **42** | **7.7** | **6.4** | **28** | **200** | -- | -- | -- |
| | 7/14/1993 | 71.63 | 18.38 | 53.25 | 110 | **6.5** | ND | ND | **1.1** | **250** | -- | -- | -- |

**GROUNDWATER MONITORING AND SAMPLING DATA**
**UNOCAL No. 3538 (351642)**
**411 W MACARTHUR BLVD**
**OAKLAND, CALIFORNIA**

| | | | | | *HYDROCARBONS* | *PRIMARY VOCS* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Location** | **Date** | ***TOC*** | ***DTW*** | ***GWE*** | ***TPH Gasoline*** | ***Benzene*** | ***Toluene*** | ***Ethylbenzene*** | ***Total Xylene*** | ***MTBE by SW8021*** | ***Ethanol*** | ***EDB*** | ***EDC*** |
| | **Units** | ***ft*** | ***ft*** | ***ft-amsl*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** |
| MW-2 | 10/14/1993 | 71.38 | 18.20 | 53.18 | 230 | **5.3** | ND | ND | **2.1** | -- | -- | -- | -- |
| | 1/12/1994 | 71.38 | 18.08 | 53.30 | 300 | **7.8** | **3.8** | **1.8** | **10** | -- | -- | -- | -- |
| | 4/9/1994 | 71.38 | 17.97 | 53.41 | 120 | **10** | **0.88** | **1.1** | **4.9** | -- | -- | -- | -- |
| | 4/11/1994 | 71.38 | 17.88 | 53.50 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 7/7/1994 | 71.38 | 17.81 | 53.57 | 110 | **4.4** | ND | ND | ND | -- | -- | -- | -- |
| | 10/5/1994 | 71.38 | 18.33 | 53.05 | 720 | **20** | ND | ND | 3.1 | -- | -- | -- | -- |
| | 1/9/1995 | 71.38 | 17.40 | 53.98 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 4/17/1995 | 71.38 | 17.50 | 53.88 | 93 | **5.6** | **0.62** | **1.7** | **5.5** | -- | -- | -- | -- |
| | 7/19/1995 | 71.38 | 18.01 | 53.37 | 77 | **32** | **0.58** | **1.7** | **4.1** | -- | -- | -- | -- |
| | 10/26/1995 | 71.38 | 18.21 | 53.17 | 54 | **13** | ND | ND | **0.72** | **220** | -- | -- | -- |
| | 1/16/1996 | 71.38 | 16.58 | 54.80 | 120 | **23** | ND | ND | **0.99** | -- | -- | -- | -- |
| | 4/15/1996 | 71.38 | 17.61 | 53.77 | 340 | **21** | ND | **2.2** | **3.7** | **45** | -- | -- | -- |
| | 7/11/1996 | 71.38 | 17.98 | 53.40 | 540 | **34** | ND | **4.3** | **12** | **150** | -- | -- | -- |
| | 1/17/1997 | 71.38 | 17.08 | 54.30 | 320 | **63** | **2.4** | **9.4** | **26** | **260** | -- | -- | -- |
| | 7/21/1997 | 71.38 | 18.06 | 53.32 | 160 | **13** | ND | **1.3** | **1.6** | **180** | -- | -- | -- |
| | 1/14/1998 | 71.38 | 16.52 | 54.86 | 66 | **6.3** | ND | ND | **0.98** | **100** | -- | -- | -- |
| | 7/6/1998 | 71.38 | 16.87 | 54.51 | ND | **2.3** | ND | ND | ND | **11** | -- | -- | -- |
| | 1/13/1999 | 71.38 | 17.88 | 53.50 | 53 | **24** | ND | **0.52** | **0.98** | **120** | -- | -- | -- |
| | 8/31/1999 | 71.34 | 18.45 | 52.89 | 86 | **14** | ND | **0.63** | ND | **21** | -- | -- | -- |
| | 1/21/2000 | 71.34 | 17.73 | 53.61 | ND | **1.94** | ND | ND | ND | **10.1** | -- | -- | -- |
| | 7/10/2000 | 71.34 | 18.14 | 53.20 | ND | ND | ND | ND | ND | **46.6** | -- | -- | -- |
| | 1/4/2001 | 71.34 | 18.02 | 53.32 | ND | **0.925** | ND | ND | ND | ND | -- | -- | -- |
| | 7/16/2001 | 71.34 | 18.02 | 53.32 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/28/2002 | 71.34 | 17.57 | 53.77 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <2.5 | -- | -- | -- |
| | 7/12/2002 | 71.34 | 18.05 | 53.29 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <2.5 | -- | -- | -- |
| | 1/14/2003 | 71.34 | 17.44 | 53.90 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <2.0 | -- | -- | -- |
| | 7/10/2003 | 71.34 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 2/4/2004 | 71.34 | 17.22 | 54.12 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <5.0 | -- | -- | -- |
| | 7/29/2004 | 71.34 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/2/2005 | 71.34 | 16.63 | 54.71 | **99** | **26** | <0.50 | 3.5 | 2.8 | <5.0 | -- | -- | -- |
| | 9/30/2005 | 71.34 | 17.94 | 53.40 | <50 | **1.2** | <0.30 | <0.30 | <0.60 | **1.6** | -- | -- | -- |
| | 3/23/2006 | 71.34 | 16.74 | 54.60 | <50 | **3.6** | <0.30 | 0.35 | <0.60 | **2.5** | -- | -- | -- |
| | 9/26/2006 | 71.34 | 17.91 | 53.43 | <50 | **1.2** | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/15/2007 | 71.34 | 17.45 | 53.89 | **110** | **6.5** | <0.30 | **0.70** | <0.60 | **1.7** | -- | -- | -- |
| | 9/27/2007 | 71.34 | 18.23 | 53.11 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/27/2008 | 71.34 | 17.77 | 53.57 | <50 | 1.8 | <0.30 | <0.30 | <0.60 | **1.3** | -- | -- | -- |
| | 9/17/2008 | 71.34 | 18.06 | 53.28 | <50 | 1.6 | <0.30 | <0.30 | <0.60 | **3.1** | -- | -- | -- |
| | 3/27/2009 | 71.34 | 17.43 | 53.91 | <50 | 3.5 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 9/17/2009 | 71.34 | 18.01 | 53.33 | <50 | 2.7 | <0.30 | <0.30 | <0.60 | **1.1** | -- | -- | -- |
| | 3/23/2010 | 71.34 | 17.47 | 53.87 | <50 | 0.68 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 9/21/2010 | 71.34 | 18.41 | 52.93 | **69** | 1.6 | <0.30 | <0.30 | <0.60 | 1.6 | -- | -- | -- |
| | 3/30/2011 | 71.34 | 16.58 | 54.76 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | 1.6 | -- | -- | -- |
| | 09/06/2011 | 71.34 | 18.14 | 53.20 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | <0.50 | -- |
| | 02/03/2012 | 71.34 | 17.97 | 53.37 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | <0.50 | -- |
| | 08/17/2012 | 71.34 | 18.20 | 53.14 | **57** | **1.2** | <0.30 | <0.30 | <0.60 | <1.0 | <250 | <0.50 | <0.50 |
| | 2/14/2013 | 71.34 | 17.88 | 53.46 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | <250 | <0.50 | <0.50 |
| MW-3 | **screened from 5 to 29 feet bgs** | | | | | | | | | | | | |
| | 9/15/1989 | -- | -- | -- | **32** | ND | ND | ND | ND | -- | -- | -- | -- |
| | 1/23/1990 | -- | -- | -- | **450** | **110** | **1.2** | **4.4** | **11** | -- | -- | -- | -- |
| | 4/19/1990 | -- | -- | -- | **3100** | **600** | **27** | **54** | **220** | -- | -- | -- | -- |
| | 7/17/1990 | -- | -- | -- | **4000** | **270** | **48** | **130** | **250** | -- | -- | -- | -- |
| | 10/16/1990 | -- | -- | -- | **740** | **210** | **1.4** | **2.5** | **82** | -- | -- | -- | -- |
| | 1/15/1991 | -- | -- | -- | **3200** | **460** | **1.5** | **120** | **270** | -- | -- | -- | -- |
| | 4/12/1991 | -- | -- | -- | **880** | **170** | **1.1** | **34** | **110** | -- | -- | -- | -- |
| | 7/15/1991 | -- | -- | -- | **9200** | **1300** | **230** | **490** | **1900** | -- | -- | -- | -- |
| | 10/15/1991 | -- | -- | -- | **3100** | **390** | **34** | **150** | **390** | -- | -- | -- | -- |
| | 1/15/1992 | -- | -- | -- | **3000** | **590** | **14** | **310** | **750** | -- | -- | -- | -- |
| | 4/14/1992 | -- | -- | -- | **14000** | **660** | **48** | **560** | **2000** | -- | -- | -- | -- |
| | 7/14/1992 | -- | -- | -- | **21000** | **890** | **200** | **1200** | **4300** | -- | -- | -- | -- |
| | 10/12/1992 | -- | -- | -- | **3200** | **160** | **10** | **230** | **540** | -- | -- | -- | -- |
| | 1/8/1993 | -- | -- | -- | **1100** | **48** | **0.99** | **0.9** | **93** | -- | -- | -- | -- |
| | 4/13/1993 | 72.06 | 17.96 | 54.10 | **12000** | **290** | **38** | **760** | **2300** | **1400** | -- | -- | -- |
| | 7/14/1993 | 72.06 | 18.54 | 53.52 | **6300** | **190** | ND | **430** | **1000** | **860** | -- | -- | -- |
| | 10/14/1993 | 71.86 | 18.45 | 53.41 | **2500** | **52** | ND | **110** | **250** | -- | -- | -- | -- |
| | 1/12/1994 | 71.86 | 18.34 | 53.52 | **3800** | **78** | ND | **180** | **390** | -- | -- | -- | -- |
| | 4/9/1994 | 71.86 | 18.19 | 53.67 | **1800** | **22** | ND | **140** | **280** | -- | -- | -- | -- |
| | 4/11/1994 | 71.86 | 18.12 | 53.74 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 7/7/1994 | 71.86 | 18.21 | 53.65 | **110** | **4.5** | ND | ND | ND | -- | -- | -- | -- |
| | 10/5/1994 | 71.86 | 18.58 | 53.28 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 1/9/1995 | 71.86 | 17.69 | 54.17 | ND | **0.68** | ND | ND | ND | -- | -- | -- | -- |
| | 4/17/1995 | 71.86 | 17.68 | 54.18 | **3700** | **80** | **10** | **270** | **510** | -- | -- | -- | -- |
| | 7/19/1995 | 71.86 | 18.20 | 53.66 | **15000** | **330** | **27** | **990** | **2400** | -- | -- | -- | -- |
| | 10/26/1995 | 71.86 | 18.32 | 53.54 | **14000** | **420** | **180** | **750** | **1600** | **4800** | -- | -- | -- |
| | 1/16/1996 | 71.86 | 17.95 | 53.91 | **920** | **38** | ND | **30** | **57** | -- | -- | -- | -- |
| | 4/15/1996 | 71.86 | 17.78 | 54.08 | **9700** | **240** | ND | **570** | **860** | **3200** | -- | -- | -- |

**TABLE 1**

**GROUNDWATER MONITORING AND SAMPLING DATA**
**UNOCAL No. 3538 (351642)**
**411 W MACARTHUR BLVD**
**OAKLAND, CALIFORNIA**

| | | | | | HYDROCARBONS | PRIMARY VOCS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Date | TOC | DTW | GWE | TPH Gasoline | Benzene | Toluene | Ethylbenzene | Total Xylene | MTBE by SW8021 | Ethanol | EDB | EDC |
| | Units | ft | ft | ft-amsl | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L | µg/L |
| MW-3 | 7/11/1996 | 71.86 | 18.19 | 53.67 | **13000** | **69** | **5.5** | **430** | **900** | **740** | -- | -- | -- |
| | 1/17/1997 | 71.86 | 17.23 | 54.63 | **4400** | **25** | ND | **270** | **580** | **1600** | -- | -- | -- |
| | 7/21/1997 | 71.86 | 18.29 | 53.57 | **9000** | **36** | ND | **450** | **800** | **950** | -- | -- | -- |
| | 1/14/1998 | 71.86 | 16.71 | 55.15 | **7100** | **40** | ND | **380** | **360** | **930** | -- | -- | -- |
| | 7/6/1998 | 71.86 | 17.03 | 54.83 | **6800** | **39** | ND | **320** | **360** | **370** | -- | -- | -- |
| | 1/13/1999 | 71.86 | 18.00 | 53.86 | **1800** | **9.4** | ND | **58** | **36** | **180** | -- | -- | -- |
| | 8/31/1999 | 71.40 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 1/21/2000 | 71.40 | 17.58 | 53.82 | ND | ND | ND | ND | ND | **21.4** | -- | -- | -- |
| | 7/10/2000 | 71.40 | 18.05 | 53.35 | ND | ND | ND | ND | ND | **162** | -- | -- | -- |
| | 8/25/2000 | 71.40 | 17.82 | 53.58 | -- | -- | -- | -- | -- | **180** | -- | -- | -- |
| | 1/4/2001 | 71.40 | 18.16 | 53.24 | ND | ND | ND | ND | ND | **193** | -- | -- | -- |
| | 7/16/2001 | 71.40 | 17.98 | 53.42 | ND | ND | ND | ND | ND | **660** | -- | -- | -- |
| | 1/28/2002 | 71.40 | 17.84 | 53.56 | <50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | **34** | -- | -- | -- |
| | 7/12/2002 | 71.40 | 17.87 | 53.53 | <50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | **11** | -- | -- | -- |
| | 1/14/2003 | 71.40 | 17.28 | 54.12 | <50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | **12** | -- | -- | -- |
| | 7/10/2003 | 71.40 | 17.64 | 53.76 | <50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | **23** | -- | -- | -- |
| | 2/4/2004 | 71.40 | 17.05 | 54.35 | <50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | **26** | -- | -- | -- |
| | 7/29/2004 | 71.40 | 17.82 | 53.58 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | ND<1 | -- | -- | -- |
| | 3/2/2005 | 71.40 | 16.47 | 54.93 | **93** | <0.50 | <0.50 | <0.50 | <0.50 | 140 | -- | -- | -- |
| | 9/30/2005 | 71.40 | 17.79 | 53.61 | **65** | <0.30 | <0.30 | <0.30 | <0.60 | 61 | -- | -- | -- |
| | 3/23/2006 | 71.40 | 16.61 | 54.79 | **54** | <0.30 | **0.41** | ND<0.30 | **0.98** | **63** | -- | -- | -- |
| | 9/26/2006 | 71.40 | 17.77 | 53.63 | **51** | <0.30 | <0.30 | <0.30 | <0.60 | **41** | -- | -- | -- |
| | 3/15/2007 | 71.40 | 17.27 | 54.13 | **140** | <0.30 | <0.30 | <0.30 | <0.60 | **110** | -- | -- | -- |
| | 9/27/2007 | 71.40 | 18.48 | 52.92 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | **20** | -- | -- | -- |
| | 3/27/2008 | 71.40 | 17.67 | 53.73 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | **19** | -- | -- | -- |
| | 9/17/2008 | 71.40 | 17.91 | 53.49 | **56** | <0.30 | <0.30 | <0.30 | <0.60 | **43** | -- | -- | -- |
| | 3/27/2009 | 71.40 | 17.34 | 54.06 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | **15** | -- | -- | -- |
| | 9/17/2009 | 71.40 | 17.88 | 53.52 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | **30** | -- | -- | -- |
| | 3/23/2010 | 71.40 | 17.33 | 54.07 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | **22** | -- | -- | -- |
| | 9/21/2010 | 71.40 | 18.28 | 53.12 | **69** | <0.30 | <0.30 | <0.30 | <0.60 | **48** | -- | -- | -- |
| | 3/30/2011 | 71.40 | 16.50 | 54.90 | **110** | <0.30 | <0.30 | <0.30 | <0.60 | **73** | -- | -- | -- |
| | 09/06/2011 | 71.40 | 18.03 | 53.37 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | **4.7** | -- | <0.50 | -- |
| | 02/03/2012 | 71.40 | 17.83 | 53.57 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | **8.2** | -- | <0.50 | -- |
| | 08/17/2012 | 71.40 | 18.07 | 53.33 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | **4.7** | <250 | <0.50 | <0.50 |
| | 2/14/2013 | 71.40 | 17.72 | 53.68 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | **5.1** | <250 | <0.50 | <0.50 |
| MW-4 | **screened from 5 to 29 feet bgs** | | | | | | | | | | | | |
| | 9/15/1989 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 1/23/1990 | -- | -- | -- | ND | ND | 0.4 | ND | ND | -- | -- | -- | -- |
| | 4/19/1990 | -- | -- | -- | ND | ND | 0.48 | ND | ND | -- | -- | -- | -- |
| | 7/17/1990 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 10/16/1990 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 1/15/1991 | -- | -- | -- | ND | ND | ND | -- | ND | -- | -- | -- | -- |
| | 4/12/1991 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 7/15/1991 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 7/14/1992 | -- | -- | -- | ND | **1.3** | **2.5** | ND | **1.0** | -- | -- | -- | -- |
| | 4/13/1993 | 71.98 | 17.67 | 54.31 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/14/1993 | 71.98 | 18.31 | 53.67 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 10/14/1993 | 71.64 | 18.08 | 53.56 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 1/12/1994 | 71.64 | 17.97 | 53.67 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 4/11/1994 | 71.64 | 17.70 | 53.94 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/7/1994 | 71.64 | 17.80 | 53.84 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 10/5/1994 | 71.64 | 18.28 | 53.36 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 1/9/1995 | 71.64 | 17.38 | 54.26 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 4/17/1995 | 71.64 | 17.21 | 54.43 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/19/1995 | 71.64 | 17.82 | 53.82 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 10/26/1995 | 71.64 | 18.17 | 53.47 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 1/16/1996 | 71.64 | 16.45 | 55.19 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 4/15/1996 | 71.64 | 17.35 | 54.29 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/11/1996 | 71.64 | 17.81 | 53.83 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/17/1997 | 71.64 | 16.73 | 54.91 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/21/1997 | 71.64 | 17.91 | 53.73 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/14/1998 | 71.64 | 16.18 | 55.46 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/6/1998 | 71.64 | 16.49 | 55.15 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/13/1999 | 71.64 | 17.29 | 54.35 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 8/31/1999 | 71.54 | -- | -- | Sampled Annually in the Third Quarter | | | | | | | | |
| | 1/21/2000 | 71.54 | 17.51 | 54.03 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/10/2000 | 71.54 | 17.93 | 53.61 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/4/2001 | 71.54 | 18.10 | 53.44 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/16/2001 | 71.54 | 17.76 | 53.78 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/28/2002 | 71.54 | 17.20 | 54.34 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/12/2002 | 71.54 | 17.81 | 53.73 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <2.5 | -- | -- | -- |
| | 1/14/2003 | 71.54 | 17.30 | 54.24 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/10/2003 | 71.54 | 17.58 | 53.96 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <2.0 | -- | -- | -- |
| | 2/4/2004 | 71.54 | 17.07 | 54.47 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/29/2004 | 71.54 | 17.81 | 53.73 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1 | -- | -- | -- |

**TABLE 1**

**GROUNDWATER MONITORING AND SAMPLING DATA**
**UNOCAL No. 3538 (351642)**
**411 W MACARTHUR BLVD**
**OAKLAND, CALIFORNIA**

| | | | | | *HYDROCARBONS* | *PRIMARY VOCS* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Location** | **Date** | ***TOC*** | ***DTW*** | ***GWE*** | ***TPH Gasoline*** | ***Benzene*** | ***Toluene*** | ***Ethylbenzene*** | ***Total Xylene*** | ***MTBE by SW8021*** | ***Ethanol*** | ***EDB*** | ***EDC*** |
| | **Units** | ***ft*** | ***ft*** | ***ft-amsl*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** |
| MW-4 | 3/2/2005 | 71.54 | 16.25 | 55.29 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/30/2005 | 71.54 | 17.74 | 53.80 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/23/2006 | 71.54 | -- | -- | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/26/2006 | 71.54 | 17.71 | 53.83 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/15/2007 | 71.54 | 17.56 | 53.98 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/27/2007 | 71.54 | 18.16 | 53.38 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/27/2008 | 71.54 | 17.58 | 53.96 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/17/2008 | 71.54 | 17.87 | 53.67 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/27/2009 | 71.54 | 17.17 | 54.37 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/17/2009 | 71.54 | 17.86 | 53.68 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/23/2010 | 71.54 | 17.25 | 54.29 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/21/2010 | 71.54 | 18.31 | 53.23 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/30/2011 | 71.54 | 16.35 | 55.19 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 09/06/2011 | 71.54 | 18.00 | 53.54 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | <0.50 | -- |
| | 02/03/2012 | 71.54 | 17.81 | 53.73 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 08/17/2012 | 71.54 | 18.09 | 53.45 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | <250 | <0.50 | <0.50 |
| | 2/14/2013 | 71.54 | 17.68 | 53.86 | | | | Sampled Annually in the Third Quarter | | | | | |
| MW-5 | **screened from 13 to 30 feet bgs** | | | | | | | | | | | | |
| | 11/30/1992 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 1/8/1993 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 4/13/1993 | 71.51 | 17.49 | 54.02 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 7/14/1993 | 71.51 | 18.02 | 53.49 | ND | ND | **0.57** | ND | ND | -- | -- | -- | -- |
| | 10/14/1993 | 71.23 | 17.82 | 53.41 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 1/12/1994 | 71.23 | 17.74 | 53.49 | ND | ND | **0.84** | ND | **1.6** | -- | -- | -- | -- |
| | 4/11/1994 | 71.23 | 17.56 | 53.67 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 7/7/1994 | 71.23 | 17.50 | 53.73 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 10/5/1994 | 71.23 | 17.98 | 53.25 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 1/9/1995 | 71.23 | 17.13 | 54.10 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 4/17/1995 | 71.23 | 17.05 | 54.18 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 7/19/1995 | 71.23 | 17.59 | 53.64 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 10/26/1995 | 71.23 | 18.10 | 53.13 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 1/16/1996 | 71.23 | 17.11 | 54.12 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 4/15/1996 | 71.23 | 17.22 | 54.01 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 7/11/1996 | 71.23 | 17.59 | 53.64 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/17/1997 | 71.23 | 16.75 | 54.48 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 7/21/1997 | 71.23 | 17.59 | 53.64 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/14/1998 | 71.23 | 16.16 | 55.07 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 7/6/1998 | 71.23 | 16.52 | 54.71 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/13/1999 | 71.23 | 17.62 | 53.61 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 8/31/1999 | 71.16 | 17.76 | 53.40 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/21/2000 | 71.16 | 16.83 | 54.33 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 7/10/2000 | 71.16 | 17.46 | 53.70 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/4/2001 | 71.16 | 17.51 | 53.65 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 7/16/2001 | 71.16 | 17.32 | 53.84 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/28/2002 | 71.16 | 17.12 | 54.04 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 7/12/2002 | 71.16 | 17.12 | 54.04 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <2.5 | -- | -- | -- |
| | 1/14/2003 | 71.16 | 16.67 | 54.49 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 7/10/2003 | 71.16 | 17.39 | 53.77 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <2.0 | -- | -- | -- |
| | 2/4/2004 | 71.16 | 16.23 | 54.93 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 7/29/2004 | 71.16 | 16.02 | 55.14 | <50 | <0.30 | 0.64 | <0.30 | 0.79 | <1 | -- | -- | -- |
| | 3/2/2005 | 71.16 | 16.43 | 54.73 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/30/2005 | 71.16 | 17.41 | 53.75 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/23/2006 | 71.16 | 16.37 | 54.79 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/26/2006 | 71.16 | 15.54 | 55.62 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/15/2007 | 71.16 | 17.20 | 53.96 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/27/2007 | 71.16 | 18.01 | 53.15 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/27/2008 | 71.16 | 17.57 | 53.59 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/17/2008 | 71.16 | 17.68 | 53.48 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/27/2009 | 71.16 | 17.14 | 54.02 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/17/2009 | 71.16 | 17.60 | 53.56 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/23/2010 | 71.16 | 17.84 | 53.32 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 9/21/2010 | 71.16 | 17.92 | 53.24 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/30/2011 | 71.16 | 15.87 | 55.29 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 09/06/2011 | 71.16 | 17.74 | 53.42 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | <0.50 | -- |
| | 02/03/2012 | 71.16 | 17.69 | 53.47 | | | | Sampled Annually in the Third Quarter | | | | | |
| | 08/17/2012 | 71.16 | 17.75 | 53.41 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | <250 | <0.50 | <0.50 |
| | 2/14/2013 | 71.16 | 17.51 | 53.65 | | | | Sampled Annually in the Third Quarter | | | | | |
| MW-6 | **screened from 13 to 30 feet bgs** | | | | | | | | | | | | |
| | 11/30/1992 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 1/8/1993 | -- | -- | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 4/13/1993 | 71.79 | 11.94 | 59.85 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 7/14/1993 | 71.79 | 17.20 | 54.59 | ND | **0.99** | **2.4** | ND | **1.9** | -- | -- | -- | -- |
| | 10/14/1993 | 71.44 | 17.21 | 54.23 | ND | ND | **0.64** | ND | ND | -- | -- | -- | -- |
| | 1/12/1994 | 71.44 | 17.44 | 54.00 | ND | ND | **1.2** | ND | **2.9** | -- | -- | -- | -- |
| | 4/11/1994 | 71.44 | 13.66 | 57.78 | | | | Sampled Annually in the Third Quarter | | | | | |

**TABLE 1**

**GROUNDWATER MONITORING AND SAMPLING DATA**
**UNOCAL No. 3538 (351642)**
**411 W MACARTHUR BLVD**
**OAKLAND, CALIFORNIA**

| | | | | | *HYDROCARBONS* | *PRIMARY VOCS* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Location** | **Date** | ***TOC*** | ***DTW*** | ***GWE*** | ***TPH Gasoline*** | ***Benzene*** | ***Toluene*** | ***Ethylbenzene*** | ***Total Xylene*** | ***MTBE by SW8021*** | ***Ethanol*** | ***EDB*** | ***EDC*** |
| | **Units** | ***ft*** | ***ft*** | ***ft-amsl*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** | ***µg/L*** |
| MW-6 | 7/7/1994 | 71.44 | 14.05 | 57.39 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 10/5/1994 | 71.44 | 14.16 | 57.28 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 1/9/1995 | 71.44 | 13.73 | 57.71 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 4/17/1995 | 71.44 | 11.30 | 60.14 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/19/1995 | 71.44 | 12.32 | 59.12 | ND | ND | ND | ND | ND | -- | -- | -- | -- |
| | 10/26/1995 | 71.44 | 17.88 | 53.56 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 1/16/1996 | 71.44 | 16.38 | 55.06 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 4/15/1996 | 71.44 | 14.00 | 57.44 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/11/1996 | 71.44 | 13.58 | 57.86 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/17/1997 | 71.44 | 15.42 | 56.02 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/21/1997 | 71.44 | 13.78 | 57.66 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/14/1998 | 71.44 | 13.65 | 57.79 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/6/1998 | 71.44 | 13.90 | 57.54 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/13/1999 | 71.44 | 14.93 | 56.51 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 8/31/1999 | 71.37 | 15.81 | 55.56 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/21/2000 | 71.37 | 16.13 | 55.24 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/10/2000 | 71.37 | 16.95 | 54.42 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/4/2001 | 71.37 | 17.09 | 54.28 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/16/2001 | 71.37 | 16.83 | 54.54 | ND | ND | ND | ND | ND | ND | -- | -- | -- |
| | 1/28/2002 | 71.37 | 14.58 | 56.79 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/12/2002 | 71.37 | 16.76 | 54.61 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <2.5 | -- | -- | -- |
| | 1/14/2003 | 71.37 | 16.25 | 55.12 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/10/2003 | 71.37 | 12.97 | 58.40 | <50 | <0.50 | <0.50 | <0.50 | <0.50 | <2.0 | -- | -- | -- |
| | 2/4/2004 | 71.37 | 16.20 | 55.17 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 7/29/2004 | 71.37 | 14.98 | 56.39 | <50 | <0.30 | <0.30 | <0.30 | <0.6 | **1.3** | -- | -- | -- |
| | 3/2/2005 | 71.37 | 14.51 | 56.86 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/30/2005 | 71.37 | 14.45 | 56.92 | <50 | <0.30 | <0.30 | <0.30 | <0.6 | **1.7** | -- | -- | -- |
| | 3/23/2006 | 71.37 | 16.55 | 54.82 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/26/2006 | 71.37 | 17.58 | 53.79 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/15/2007 | 71.37 | 13.72 | 57.65 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/27/2007 | 71.37 | 14.18 | 57.19 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/27/2008 | 71.37 | 14.83 | 56.54 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/17/2008 | 71.37 | 14.70 | 56.67 | <50 | <0.30 | <0.30 | <0.30 | <0.6 | **2.8** | -- | -- | -- |
| | 3/27/2009 | 71.37 | 15.66 | 55.71 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/17/2009 | 71.37 | 15.31 | 56.06 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/23/2010 | 71.37 | 15.42 | 55.95 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 9/21/2010 | 71.37 | 15.62 | 55.75 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | -- | -- |
| | 3/30/2011 | 71.37 | 14.12 | 57.25 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 09/06/2011 | 71.37 | 15.07 | 56.30 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | -- | <0.50 | -- |
| | 02/03/2012 | 71.37 | 14.88 | 56.49 | Sampled Annually in the Third Quarter | | | | | | | | |
| | 08/17/2012 | 71.37 | 16.08 | 55.29 | <50 | <0.30 | <0.30 | <0.30 | <0.60 | <1.0 | <250 | <0.50 | <0.50 |
| | 2/14/2013 | 71.37 | 13.66 | 57.71 | Sampled Annually in the Third Quarter | | | | | | | | |

**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
MTBE = Methyl tert butyl ether
EDB = 1,2-Dibromoethane (Ethylene dibromide)
1,2-DCA = 1,2-Dichloroethane

-- = Not available / not applicable
<x = Not detected above laboratory reported practical quantitation level.
shaded = exceeds ESL
bold = detected
[1] = Environmental Screening Level (Table F-1a) for groundwater that is a current or potential drinking water resource; *Screening for Environmental Concerns at site with Contaminated Soil and Groundwate*r; California Regional Water Quality Control Board - San Francisco Bay Region; Interim Final November 2007; revised May 2008.

**Attachment C**
**ADDITIONAL HISTORIC ANALYTICAL RESULTS**
**UNOCAL No. 3538 (351642)**
**411 W MACARTHUR BLVD**
**OAKLAND, CALIFORNIA**

| Date Sampled | TPH-D (µg/l) | 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) | Total Oil and Grease (mg/l) | Bromo-dichloro-methane (µg/l) | Bromo-form (µg/l) | Bromo-methane (µg/l) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MW-1** | | | | | | | | | | | | | |
| 9/15/1989 | ND | -- | -- | -- | -- | -- | -- | -- | ND | -- | -- | -- | |
| 1/23/1990 | ND | -- | -- | -- | -- | -- | -- | -- | 1.5 | -- | -- | -- | |
| 4/19/1990 | ND | -- | -- | -- | -- | -- | -- | -- | ND | -- | -- | -- | |
| 7/17/1990 | ND | -- | -- | -- | -- | -- | -- | -- | ND | -- | -- | -- | |
| 10/16/1990 | ND | -- | -- | -- | -- | -- | -- | -- | ND | -- | -- | -- | |
| 1/15/1991 | ND | -- | -- | -- | -- | -- | -- | -- | ND | -- | -- | -- | |
| 4/12/1991 | ND | -- | -- | -- | -- | -- | -- | -- | ND | -- | -- | -- | |
| 7/15/1991 | ND | -- | -- | -- | -- | -- | -- | -- | ND | -- | -- | -- | |
| 7/14/1992 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/14/1993 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/7/1994 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/19/1995 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/11/1996 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/21/1997 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 8/31/1999 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/16/2001 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.7 | -- | -- | |
| 7/12/2002 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/10/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/29/2004 | -- | -- | -- | -- | ND<0.5 | -- | -- | -- | -- | ND<0.5 | ND<0.5 | ND<1 | |
| 9/30/2005 | -- | -- | -- | -- | ND<0.50 | -- | -- | -- | -- | ND<0.50 | ND<0.50 | ND<1.0 | |
| 9/26/2006 | -- | -- | -- | -- | ND<0.50 | -- | -- | -- | -- | ND<0.50 | ND<0.50 | ND<1.0 | |
| 9/27/2007 | -- | -- | -- | -- | ND<0.50 | -- | -- | -- | -- | ND<0.50 | ND<0.50 | ND<1.0 | |
| 9/17/2008 | -- | -- | -- | -- | ND<0.50 | -- | -- | -- | -- | ND<0.50 | ND<0.50 | ND<1.0 | |
| **MW-3** | | | | | | | | | | | | | |
| 8/25/2000 | -- | ND | -- | ND | ND | ND | ND | ND | -- | -- | -- | -- | |
| 7/12/2002 | -- | ND<20 | ND<500 | ND<2.0 | ND<2.0 | ND<2.0 | ND<2.0 | ND<2.0 | -- | -- | -- | -- | |

**Attachment C**
**ADDITIONAL HISTORIC ANALYTICAL RESULTS**
**UNOCAL No. 3538 (351642)**

| Date Sampled | Carbon Tetra-chloride (µg/l) | Chloro-benzene (µg/l) | Chloro-ethane (µg/l) | Chloroform (µg/l) | Chloro-methane (µg/l) | Dibromo-chloro-methane (µg/l) | 1,2-Dichloro-benzene (µg/l) | 1,3-Dichloro-benzene (µg/l) | 1,4-Dichloro-benzene (µg/l) | Dichloro-difluoro-methane (µg/l) | 1,1-DCA (µg/l) | 1,1-DCE (µg/l) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MW-1** | | | | | | | | | | | | | |
| 9/15/1989 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 1/23/1990 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 4/19/1990 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/17/1990 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 10/16/1990 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 1/15/1991 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 4/12/1991 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/15/1991 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/14/1992 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/14/1993 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/7/1994 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/19/1995 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/11/1996 | -- | -- | -- | 0.96 | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/21/1997 | -- | -- | -- | 1.0 | -- | -- | -- | -- | -- | -- | -- | -- | |
| 8/31/1999 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/16/2001 | -- | -- | -- | 45 | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/12/2002 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.8 | |
| 7/10/2003 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.89 | |
| 7/29/2004 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | 1.2 | |
| 9/30/2005 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | 0.52 | |
| 9/26/2006 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | 0.60 | |
| 9/27/2007 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | |
| 9/17/2008 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | |
| **MW-3** | | | | | | | | | | | | | |
| 8/25/2000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/12/2002 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

**Attachment C**
**ADDITIONAL HISTORIC ANALYTICAL RESULTS**
**UNOCAL No. 3538 (351642)**

| Date Sampled | cis-1,2-DCE (µg/l) | trans-1,2-DCE (µg/l) | 1,2-Dichloro-propane (µg/l) | cis-1,3-Dichloro-propene (µg/l) | trans-1,3-Dichloro-propene (µg/l) | Methylene chloride (µg/l) | 1,1,2,2-Tetrachloro-ethane (µg/l) | Tetrachloro-ethene (PCE) (µg/l) | Trichloro-trifluoro-ethane (µg/l) | 1,1,1-Trichloro-ethane (µg/l) | 1,1,2-Trichloro-ethane (µg/l) | Trichloro-ethene (TCE) (µg/l) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MW-1** | | | | | | | | | | | | | |
| 9/15/1989 | -- | -- | -- | -- | -- | -- | -- | 2.7 | -- | -- | -- | -- | |
| 1/23/1990 | -- | -- | -- | -- | -- | -- | -- | 2.1 | -- | -- | -- | -- | |
| 4/19/1990 | -- | -- | -- | -- | -- | -- | -- | 2.2 | -- | -- | -- | -- | |
| 7/17/1990 | -- | -- | -- | -- | -- | -- | -- | 1.7 | -- | -- | -- | -- | |
| 10/16/1990 | -- | -- | -- | -- | -- | -- | -- | 2.0 | -- | -- | -- | -- | |
| 1/15/1991 | -- | -- | -- | -- | -- | -- | -- | 2.1 | -- | -- | -- | -- | |
| 4/12/1991 | -- | -- | -- | -- | -- | -- | -- | 2.0 | -- | -- | -- | -- | |
| 7/15/1991 | -- | -- | -- | -- | -- | -- | -- | 1.8 | -- | -- | -- | -- | |
| 7/14/1992 | -- | -- | -- | -- | -- | -- | -- | 1.4 | -- | -- | -- | -- | |
| 7/14/1993 | -- | -- | -- | -- | -- | -- | -- | 0.95 | -- | -- | -- | -- | |
| 7/7/1994 | -- | -- | -- | -- | -- | -- | -- | 0.83 | -- | -- | -- | -- | |
| 7/19/1995 | -- | -- | -- | -- | -- | -- | -- | 0.52 | -- | -- | -- | -- | |
| 7/11/1996 | -- | -- | -- | -- | -- | -- | -- | 0.73 | -- | -- | -- | -- | |
| 7/21/1997 | -- | -- | -- | -- | -- | -- | -- | 0.70 | -- | -- | -- | -- | |
| 8/31/1999 | -- | -- | -- | -- | -- | -- | -- | ND | -- | -- | -- | -- | |
| 7/16/2001 | -- | -- | -- | -- | -- | -- | -- | ND | -- | -- | -- | -- | |
| 7/12/2002 | -- | -- | -- | -- | -- | -- | -- | ND<0.60 | -- | -- | -- | -- | |
| 7/10/2003 | -- | -- | -- | -- | -- | -- | -- | ND<0.50 | -- | -- | -- | -- | |
| 7/29/2004 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ND<1 | ND<0.5 | ND<0.5 | 13 | ND<0.5 | ND<0.5 | ND<0.5 | |
| 9/30/2005 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<1.0 | ND<0.50 | ND<0.50 | 9.1 | ND<0.50 | ND<0.50 | ND<0.50 | |
| 9/26/2006 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<1.0 | ND<0.50 | ND<0.50 | 7.0 | ND<0.50 | ND<0.50 | ND<0.50 | |
| 9/27/2007 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<1.0 | ND<0.50 | ND<0.50 | 4.3 | ND<0.50 | ND<0.50 | ND<0.50 | |
| 9/17/2008 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<0.50 | ND<1.0 | ND<0.50 | ND<0.50 | 5.4 | ND<0.50 | ND<0.50 | ND<0.50 | |
| **MW-3** | | | | | | | | | | | | | |
| 8/25/2000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |
| 7/12/2002 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | |

**Attachment C**
**ADDITIONAL HISTORIC ANALYTICAL RESULTS**
**UNOCAL No. 3538 (351642)**

| Date Sampled | Trichloro-fluoro-methane (µg/l) | Vinyl chloride (µg/l) | Comments |
|---|---|---|---|
| **MW-1** | | | |
| 9/15/1989 | -- | -- | |
| 1/23/1990 | -- | -- | |
| 4/19/1990 | -- | -- | |
| 7/17/1990 | -- | -- | |
| 10/16/1990 | -- | -- | |
| 1/15/1991 | -- | -- | |
| 4/12/1991 | -- | -- | |
| 7/15/1991 | -- | -- | |
| 7/14/1992 | -- | -- | |
| 7/14/1993 | -- | -- | |
| 7/7/1994 | -- | -- | |
| 7/19/1995 | -- | -- | |
| 7/11/1996 | -- | -- | |
| 7/21/1997 | -- | -- | |
| 8/31/1999 | -- | -- | |
| 7/16/2001 | -- | -- | |
| 7/12/2002 | -- | -- | |
| 7/10/2003 | -- | -- | |
| 7/29/2004 | ND<0.5 | ND<0.5 | |
| 9/30/2005 | ND<0.50 | ND<0.50 | |
| 9/26/2006 | ND<0.50 | ND<0.50 | |
| 9/27/2007 | ND<0.50 | ND<0.50 | |
| 9/17/2008 | ND<0.50 | ND<0.50 | |
| **MW-3** | | | |
| 8/25/2000 | -- | -- | |
| 7/12/2002 | -- | -- | |

**Table 4**
Historical Grab Groundwater Analytical Results
Former 76 Service Station No. 3538
411 W. MacArthur Blvd
Oakland, CA

| Sample ID | Date | Depth (ft) | TPHg (ug/L) | Benzene (ug/L) | Toluene (ug/L) | Ethylbenzene (ug/L) | Total Xylenes (ug/L) | MTBE (ug/L) | TBA (ug/L) | TAME (ug/L) | DIPE (ug/L) | ETBE (ug/L) | EDB (ug/L) | 1-2,DCA (ug/L) | Ethanol (ug/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-1W | 3/27/2006 | -- | **120** | **11** | <0.050 | <0.050 | <1.0 | **130** | **28** | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <100 |
| SB-2W | 3/27/2006 | -- | <50 | <0.050 | <0.050 | <0.050 | <1.0 | <0.050 | <5.0 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <100 |
| SB-3W | 3/27/2006 | -- | **13000** | **510** | **470** | **1400** | **2600** | **340** | **57** | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <100 |
| SB-4W | 3/27/2006 | -- | <50 | <0.050 | <0.050 | <0.050 | <1.0 | **3.4** | <5.0 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <100 |
| SB-5W | 3/27/2006 | -- | **3000** | **44** | **63** | **1.2** | **30** | **53** | **17** | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <100 |
| | | | | | | | | | | | | | | | |
| SB-8@20-25 | 12/20/10 | 20-25 | **2000** | <0.50 | **48** | **98** | **340** | <0.50 | <10 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <250 |
| SB-9@17-22 | 12/20/10 | 17-22 | **9500** | **430** | **2000** | **330** | **2100** | **190** | <5.0 | <5.0 | <100 | <5.0 | <5.0 | <5.0 | <2500 |
| SB-9@24-29 | 12/20/10 | 24-29 | **2900** | **79** | **470** | **100** | **540** | <5.0 | <5.0 | <5.0 | <100 | <5.0 | <5.0 | <5.0 | <2500 |
| SB-10@17-22 | 12/20/10 | 17-22 | **1500** | **20** | **0.96** | **75** | **8.3** | <0.50 | <10 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <250 |
| SB-10@24-29 | 12/20/10 | 24-29 | **310** | **1.8** | **25** | **12** | **63** | **5.8** | <10 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <250 |

TPHg = total petroelum hydrocarbons as gasoline TPHd = total petroleum hydrocarbons as diesel MTBE = metyl tert butyl ether TBA = tert butyl alcohol TAME = tert amyl methyl ether
DIPE = diisopropyl ether ETBE = ethyl tert butyl ether EDB = ethylene dibromide 1,2-DCA = 1,2 dicholorethane TOG = total oil and grease ND = non detect, where reporting limit is not known
**bold** = value above reporting limit ug/L = micrograms per liter

# Attachment C

# Data Gap Investigation Plan

Attachment C
Data Gap Investigation Plan
Unocal No. 3538 (351642)
411 West MacArthur Boulevard, Oakland,

| Item | Data Gaps | Proposed Investigation | Rationale | Analysis |
|---|---|---|---|---|
| 1 | The well survey performed did not include a search of the Alameda County Public Works (ACPW) well database. | A well search request was submitted on August 5, 2013 to ACPW. The Site Conceptual Model will be updated when the results are received. | Additional wells may be identified that effect the distance from the defined plume boundary and effect under which scenario of the LTCP Media-Specific Criteria for Groundwater the site falls. | Not Applicable |
| 2 | Two off-site, downgradient soil borings, SB-6 and SB-7, were proposed in a work plan submitted in May 2009 to further delineate downgradient hydrocarbon concentrations. Due to permitting and access agreement issues, these soil borings were not drilled. | Two borings will be advanced with a hollow stem auger drill rig to depth (up to approximately 30 feet bgs) and completed as nested groundwater monitoring wells (MW-7 and MW-8) as shown on **Figure C1**. Well location MW-7A is a backup location if access to MW-7 is unattainable. Soil lithology will be logged at 5-foot intervals using the Unified Soil Classification System protocols and samples will be collected for laboratory analysis. The soil samples will be field screened for organic vapors using a photoionization detector (PID).<br><br>The nested wells will be constructed of 2-inch-diameter polyvinyl chloride pipe, with two 3-foot screened intervals from approximately 17 to 20 feet bgs and 27 to 30 feet bgs. The exact well screen intervals will be determined based on field observations with the intent of installing one screen near the top of the water table and another in coarse grained material near the bottom of the boring.<br>The wells will be capped with a locking, water-tight cap, in a flush-mounted, traffic-rated well box. The well will be surveyed by a California-licensed surveyor to GeoTracker specifications.<br><br>Twenty-four hours after the well has been installed, it will be developed using a surge block and bailer for a minimum of 10 well volumes or until the water is sand free. A submersible pump will be used to complete the well development. During development, the groundwater will be monitored for temperature, pH, conductivity, and turbidity. The well will be developed until the turbidity readings are 10 NTUs or consistent in magnitude.<br><br>Depth to groundwater measuring and groundwater sampling will be conducted approximately 48 hours after development. The wells will be purged prior to sample collection. | Off-site soil boring SB-1 was advanced in March 2006. total purgeable petroleum hydrocarbons, benzene, and MTBE were detected in groundwater grab samples at 120, 11, and 30 µg/L, respectively.<br><br>The proposed investigation will help to further define the plume length and establish under which scenario of the LTCP Media-Specific Criteria for Groundwater the site falls. | *Groundwater:* TPHg, BTEX, and fuel oxygenates by EPA Method 8260<br><br>*Soil:* TPHg, BTEX, and fuel oxygenates by EPA Method 8260 (samples to be collected using field preservation in accordance with EPA Method 5035) |

Attachment C
Data Gap Investigation Plan
Unocal No. 3538 (351642)
411 West MacArthur Boulevard, Oakland,

| Item | Data Gaps | Proposed Investigation | Rationale | Analysis |
|---|---|---|---|---|
| 3 | Confirm that hydraulic hoists were not present in the former station building and additional sources for impacts are not present | Visual inspection of former service station building currently used for alternator sales and distribution. | Past reports do not address the car repair operations; however, no site as-built drawings indicate any in building equipment. | Not Applicable |


Map Source: ESRI Data Resource Center 2011.

AECOM
10461 Old Placervillle Rd, Suite 170
Sacramento, CA 95827
916.361.6400

N

0 15 30 Feet

Unocal No. 3538 (351642)
411 West MacArthur Boulevard
Oakland, California

**Proposed Monitoring Well Locations**

DATE: 09/11/2013 | DWRN:JH | Revision: 0

**FIGURE C1**

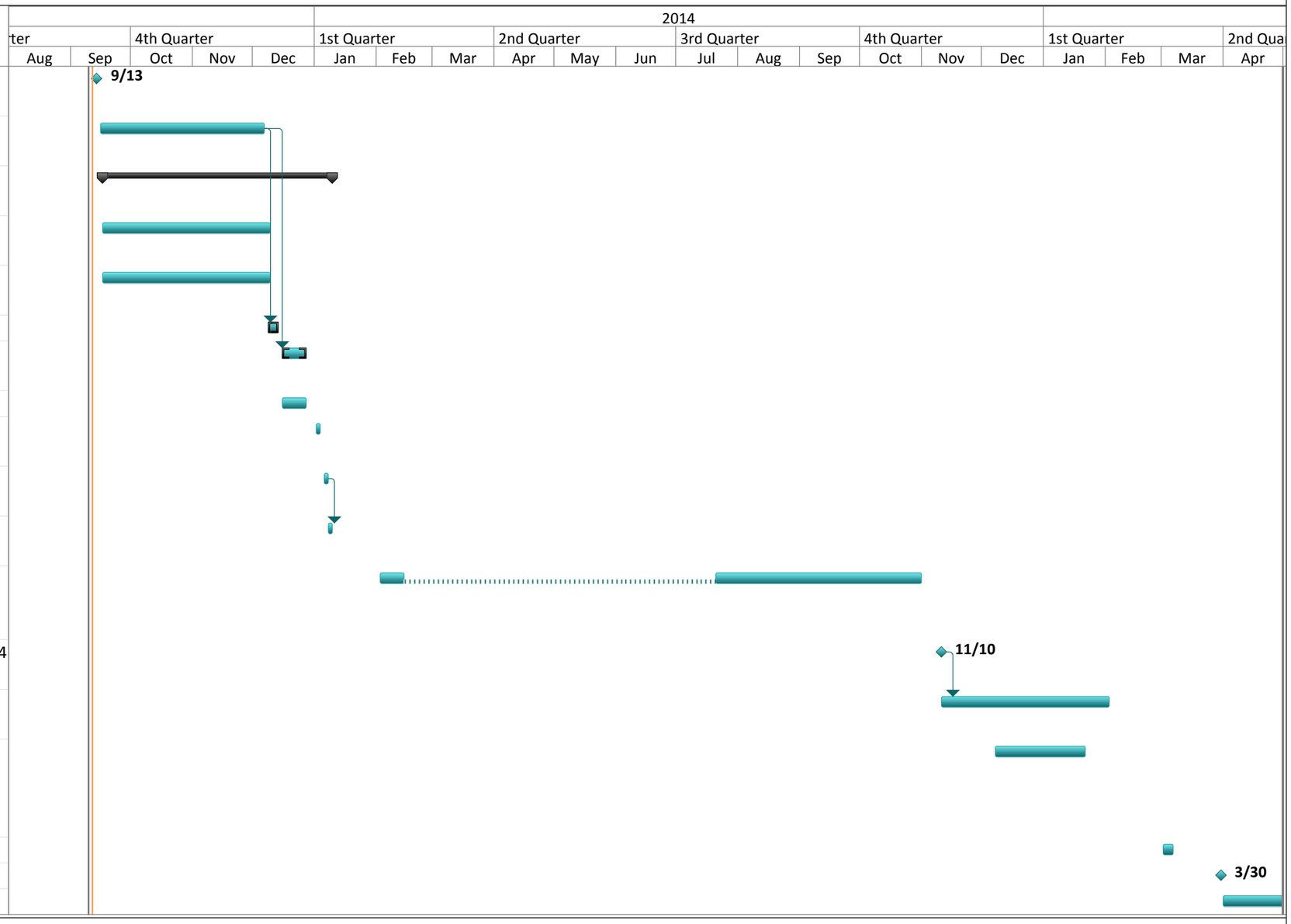
T:\Utilities\Templates\B_Portrait_AECOM.mxt

# Attachment D

# Path to Closure Schedule

**ATTACHMENT D**
**PATH TO CLOSURE SCHEDULE**
**Unocal No. 3538 (351642)**
**411 West MacArthur BoulevardOakland, Califronia**

| ID | Task Name | Duration | Start | Finish |
|---|---|---|---|---|
| 1 | Respond to LTCP Technical Comments | 1 day | Fri 9/13/13 | Fri 9/13/13 |
| 2 | ACEH Draft Report Review | 60 days | Mon 9/16/13 | Fri 12/6/13 |
| 3 | **Data Gap Investigation Plan** | **83 days** | **Tue 9/17/13** | **Thu 1/9/14** |
| 4 | Permit Acquisition (Well & Encroachment) | 60 days | Tue 9/17/13 | Mon 12/9/13 |
| 5 | Select Drillers-Subcontractor | 60 days | Tue 9/17/13 | Mon 12/9/13 |
| 6 | Schedule Driller Work | 5 days | Mon 12/9/13 | Fri 12/13/13 |
| 7 | Notify Affected Property Owners, | 10 days | Mon 12/16/13 | Fri 12/27/13 |
| 8 | Utility Location | 10 days | Mon 12/16/13 | Fri 12/27/13 |
| 9 | Perform Well Installation | 2 days | Thu 1/2/14 | Fri 1/3/14 |
| 10 | Develop New Monitoring Wells | 2 days | Mon 1/6/14 | Tue 1/7/14 |
| 11 | Sample New Well, After Development | 2 days | Wed 1/8/14 | Thu 1/9/14 |
| 12 | Add New Wells to Site Wide Groundwater Monitoring | 85 days | Mon 2/3/14 | Fri 10/31/14 |
| 13 | Submit Revised Site Closure Request | 1 day | Mon 11/10/14 | Mon 11/10/14 |
| 14 | ACEH Review Revised Closure Request | 60 days | Tue 11/11/14 | Mon 2/2/15 |
| 15 | Well Destruction Work Plan While ACEH Reviews Closure Request | 33 days | Mon 12/8/14 | Wed 1/21/15 |
| 16 | Well Destruction | 5 days | Mon 3/2/15 | Fri 3/6/15 |
| 17 | Final Report | 1 day | Mon 3/30/15 | Mon 3/30/15 |
| 18 | Final Site Closure | 22 days | Wed 4/1/15 | Thu 4/30/15 |




Project: Project 6028407
Date: Thu 9/12/13

Task | Milestone | Project Summary | Manual Summary
Split | Summary | Manual Task