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Fourth Quarter 2012 and First Quarter 2013 Semi-Annual Groundwater Monitoring Report
Former BP Station #11109,
4280 Foothill Blvd
Oakland, California
ACEH Case #RO0000426

ENVIRONMENT

"I declare that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct."

Date:
April 30, 2012

Submitted by:

ARCADIS U.S., Inc

RECEIVED
By Alameda County Environmental Health at 10:40 am, May 02, 2013

Hollis E. Phillips, PG
Project Manager

Contact:
Hollis E. Phillips

Phone:
415.432.6903

Email:
Hollis.phillips@arcadis-us.com

Our ref:
GP09BPNA.C106.N0000

Imagine the result

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Ms. Dilan Roe, P.E.
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

Subject:
Fourth Quarter 2012 and First Quarter 2013 Semi-Annual Groundwater Monitoring Report
Former BP Station #11109,
4280 Foothill Blvd, Oakland, California
ACEH Case #RO0000426

ENVIRONMENT

Date:
April 30, 2013

Contact:
Arpen Shah

Phone:
415.432.6916

Email:
Arpen.Shah@arcadis-us.com

Our ref:
GP09BPNA.C106.N0000

Dear Ms. Roe:

ARCADIS U.S., Inc. (ARCADIS) has prepared this *Fourth Quarter 2012 and First Quarter 2013 Semi-Annual Groundwater Monitoring Report* to document the results of groundwater monitoring and sampling and remediation progress at the Former BP Service Station #11109 located at 4280 Foothill Boulevard in Oakland, Alameda County, California (the Site; Figure 1).

1. Summary

A summary of the work performed at the Site during this reporting period and the proposed work for the next reporting period is provided below.

Work Performed – This Semi-Annual Reporting Period (October 1, 2012 to March 31, 2013)

- Conducted First Quarter 2013 semi-annual groundwater monitoring event on March 20, 2013.

- Conducted LNAPL removal activities at monitoring wells MW-5, MW-10, and MW-12 on November 7, 2012, December 5, 2012, January 9, 2013, and March 20, 2013 as described in a letter dated October 11, 2012.

Work Proposed – Next Semi-Annual Reporting Period (April 1, 2013 to September 30, 2013)

· Submit the *Fourth Quarter 2012 and First Quarter 2013 Semi-Annual Groundwater Monitoring Report* contained herein.

· Prepare for semi-annual groundwater monitoring/sampling activities to be conducted in Third Quarter 2013.

- Prepare and submit a report summarizing DPE and LNAPL bail-down field activities and results

2. Groundwater Monitoring/Sampling Activities and Results

First Quarter 2013 groundwater monitoring was conducted on March 20, 2013 by Broadbent & Associates, Inc. (BAI) personnel. Groundwater monitoring was conducted concurrently at the adjacent Chevron #9-0076 (ACEH Case #RO0000427) to further characterize hydrogeology in the vicinity of the Site. Prior to groundwater sampling, depth-to-water measurements were collected in wells MW-3 through MW-12 with an oil/water interface probe. Light non-aqueous phase liquid (LNAPL) was observed in monitoring wells MW-5 (0.02 ft), MW-10 (0.01 ft) and MW-12 (0.04 ft). Monitoring well MW-8, which could not be located in the third quarter 2012 sampling event, was partially paved over; however, asphalt overlying the well was removed to allow for monitoring activities. Monitoring well MW-2 could not be gauged, as a vehicle was parked over the well. No other irregularities were noted during water level gauging. Depth-to-water (DTW) measurements on-site ranged from 9.48 ft below top of casing (bTOC) at MW-10 to 14.36 ft bTOC at MW-6. Resulting groundwater surface elevations on-site ranged from 29.05 feet above mean sea level (ft msl) at MW-8 to 34.06 ft msl at MW-9. Groundwater elevations at the adjacent Chevron site calculated using provided field forms and surveyed top of casing (TOC) values from GeoTracker varied from 10.75 ft msl (C-8) to 29.10 ft msl (C-10). DTW measurements recorded at monitoring well C-4 were not consistent with historical field parameter; therefore, the calculated groundwater elevation at C-4 was not used to generate groundwater contours. Field methods used during groundwater monitoring are provided in Appendix A, and field data sheets are included in Appendix B. Groundwater elevations are summarized in Table 1, and a groundwater elevation contour map is presented in Figure 2.

Groundwater samples were collected on March 20, 2013 from wells MW-3, MW-4, MW-6, MW-7, and MW-11 using HydraSleeve™ groundwater samplers, which collect a representative sample from a specific depth interval within the monitoring well screen. Samples were not collected from wells MW-5, MW-10, and MW-12 due to the presence of LNAPL. No irregularities were reported during sampling. Samples were submitted under chain-of-custody protocol to TestAmerica Laboratories, Inc. (Pleasanton, California) for analysis of Gasoline-Range Organics (GRO, C6-C12) by EPA Method 8015M (MW-4, MW-6, MW-11); for Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX), Ethyl Tertiary Butyl Ether (ETBE), Tert-Amyl Methyl Ether (TAME), Di-Isopropyl Ether (DIPE), 1,2-Dibromomethane (EDB), 1,2-Dichloroethane (1,2-DCA), Tert-Butyl Alcohol (TBA) and Ethanol by EPA Method 8260 (MW-6, MW-11); and Methyl Tertiary Butyl Ether (MTBE) by EPA Method 8260 (MW-3, MW-4,

MW-7). No significant irregularities were encountered during analysis of the samples. The laboratory analytical report, including chain-of-custody documentation, is provided in Appendix C.

Groundwater monitoring data (GEO_WELL) and laboratory analytical results (EDF) were uploaded to the GeoTracker AB2886 database. Upload confirmation receipts are provided in Appendix D.

3. LNAPL Bail-down Activities

LNAPL Removal activities were conducted over four events during the fourth quarter 2012 and first quarter 2013, as proposed in a letter dated October 11, 2012. Removal actions were conducted at monitoring wells MW-5, MW-10, and MW-12 on November 7, 2012, December 5, 2012, January 9, 2013, and after the conclusion of sampling activities on March 20, 2013. Free product thickness was measured at each location prior to bailing, following the conclusion of bailing, and prior to demobilization to assess potential rates of LNAPL recharge. Approximately 11 gallons of LNAPL/water mixture was removed from the wells during the reporting period. A summary of LNAPL removal data is presented in Table 3 and field notes are provided in Appendix B. Further discussion of LNAPL bail-down activities and an assessment of LNAPL recharge at monitoring wells MW-5, MW-10, and MW-12 will be provided in a separate report to be submitted within the next reporting period.

4. Discussion/Conclusions

Groundwater levels were between historic minimum and maximum elevations for all wells monitored on-site. The groundwater elevation observed at monitoring well C-4 at the adjacent Chevron station was a historical maximum, and thus was not considered in contouring. Groundwater elevations calculated for the Site and the adjacent Chevron facility yielded an average horizontal gradient of approximately 0.03 ft/ft. As presented in Table 2, historical interpretation of groundwater monitoring data by previous consultants indicated a shift in the groundwater flow direction from southwest to northwest in the third quarter 2009. However, review of historical field notes and groundwater contours indicates that data at various monitoring locations have consistently been designated “anomalous” and were not considered in groundwater contouring in order to render more uniform interpretation of the hydrogeology at the Site. Additionally, groundwater contouring following 2009 did not consider groundwater elevations at the adjacent Chevron station, which historically supported the interpretation that groundwater flow in the vicinity of the Site is to the southwest. Review of field measurements of DTW collected during the first quarter 2013 event indicate groundwater elevations do not vary uniformly across the Site;

however, all data collected on-site was considered to be within the range of minimum and maximum water elevations, thus no data may be considered anomalous (with the exception of C-4 at the adjacent site). Consideration of groundwater elevations at the adjacent Chevron site supports the current interpretation that the overall groundwater flow direction in the vicinity of the Site is to the southwest, as observed prior to 2009. The current groundwater elevation contour map is provided on Figure 2.

- Groundwater monitoring laboratory analytical results are summarized in Table 1 and are consistent with historical concentrations observed. A groundwater analytical summary map is presented as Figure 3.
    - GRO was detected monitoring well MW-11 with a concentration of 16,000 µg/L.
    - Benzene was detected monitoring well MW-11 with a concentration of 250 µg/L.
    - Toluene was detected monitoring well MW-11 with a concentration of 620 µg/L.
    - Ethylbenzene was detected monitoring well MW-11 with a concentration of 680 µg/L.
    - Total Xylenes were detected monitoring well MW-11 with a concentration of 2,200 µg/L.
    - MTBE was detected in three monitoring wells (MW-3, MW-4, and MW-7) ranging from 2.6 µg/L (MW-3) to 17 µg/L (MW-4)
    - ETBE, TAME, DIPE, EDB, TBA 1,2-DCA, and ethanol were below laboratory reporting limits for all wells sampled

5. Recommendations

ARCADIS recommends continued groundwater monitoring and sampling on a semi-annual basis in accordance with the approved schedule.

6. Limitations

The findings presented in this report are based upon observations of field personnel, points investigated, results of laboratory tests performed by TestAmerica Laboratories, Inc. (Pleasanton, California), and our understanding of Alameda County Environmental Health (ACEH) requirements. Our services were performed in accordance with the generally accepted standard of practice at the time this report was written. No other warranty, expressed or implied was made. This report has been prepared for the exclusive use of ARCADIS-US, Inc. and Atlantic Richfield Company. It is possible that variations in soil or groundwater conditions could exist beyond points explored in this investigation. Also, changes in site conditions could occur in the future due to variations in rainfall, temperature, regional water usage, or other factors.

If you have any questions or comments regarding the contents of this report, please contact Arpen Shah by telephone (415.432.6916) or by e-mail (Arpen.Shah@arcadis-us.com), or contact Hollis Phillips by telephone (415.432.6903) or by e-mail (Hollis.Phillips@arcadis-us.com).

Sincerely,

ARCADIS

Hollis E. Phillips, P.G. (No. 6887)
Project Manager

cc: Ms. Dilan Roe, Alameda County Environmental Health (Submitted via ACEH ftp Site)
Mr. Ed Ralston, ConocoPhillips, 76 Broadway, Sacramento, California 95818
Electronic copy uploaded to GeoTracker

ATTACHMENTS:

Figure 1:	Site Location Map
Figure 2:	Groundwater Elevation Contour Map - March 20, 2013
Figure 3:	Analytical Summary Map – March 20, 2013
Table 1:	Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
Table 2:	Historical Groundwater Flow Direction and Gradient
Table 3:	Summary of LNAPL Removal
Appendix A:	Field Methods
Appendix B:	Field Data Sheets
Appendix C:	Laboratory Report and Chain-of-Custody Documentation
Appendix D:	GeoTracker Upload Confirmation Receipts

LIST OF COMMONLY USED ACCRONYMS/ABBREVIATIONS:

ACEH:	Alameda County Environmental Health	ft/ft:	feet per foot
BAI:	Broadbent & Associates, Inc.	gal:	Gallons
BTEX:	Benzene, Toluene, Ethylbenzene, Total Xylenes	GRO:	Gasoline-Range Organics
1,2-DCA:	1,2-Dichloroethane	LNAPL:	Light Non-Aqueous Phase Liquid
DIPE:	Di-Isopropyl Ether	MTBE:	Methyl Tertiary Butyl Ether
DO:	Dissolved Oxygen	TAME:	Tert-Amyl Methyl Ether
DRO:	Diesel-Range Organics	TBA:	Tertiary Butyl Ether
EDB:	1,2-Dibromomethane	TOC:	Top of Casing
EPA:	Environmental Protection Agency	µg/L:	Micrograms per liter
ETBE:	Ethyl Tertiary Butyl Ether		

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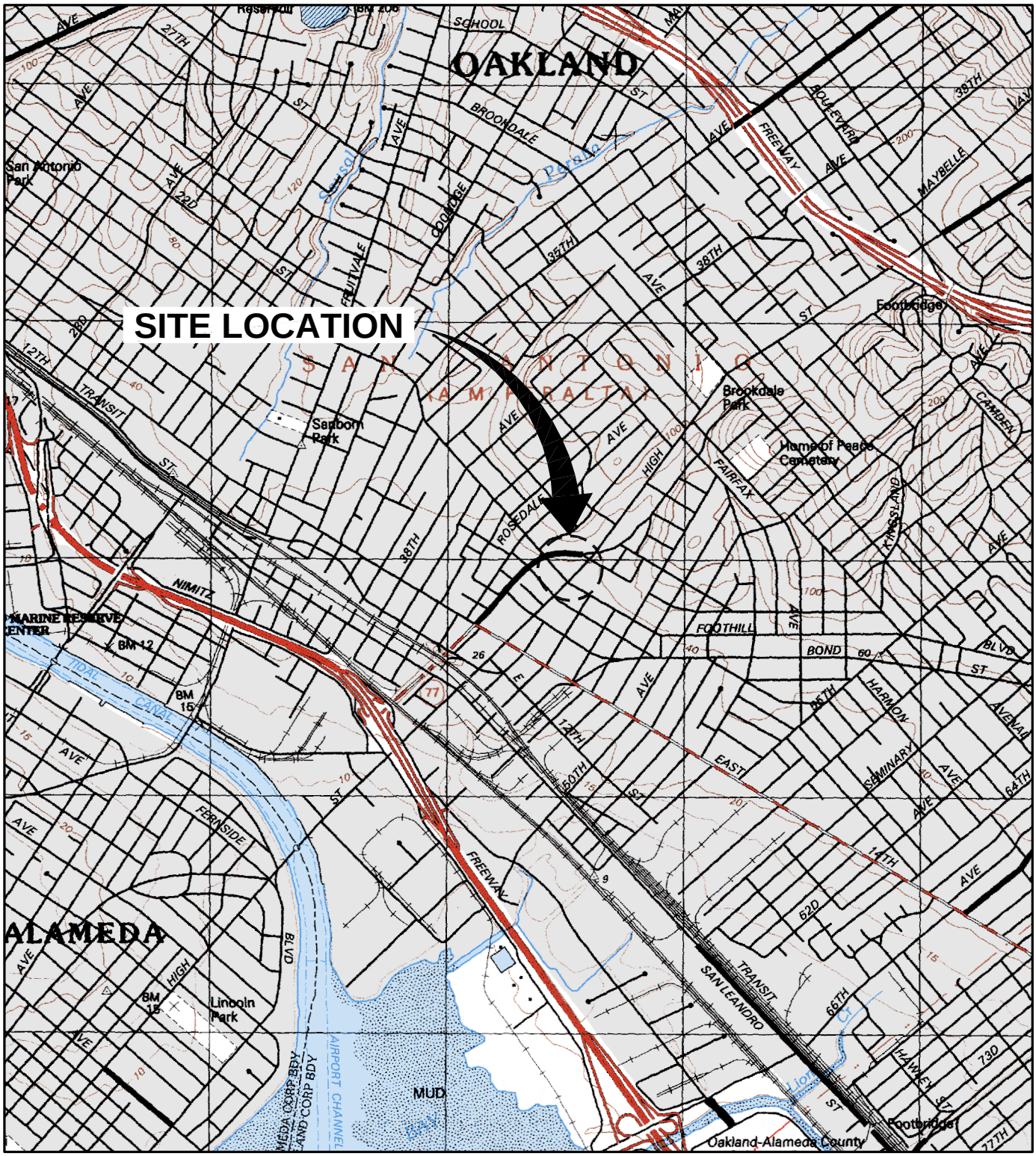
Figures



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD.,OAKLAND WEST, CA., 1993, AND SAN LEANDRO, 1993, REVISED 1996.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.

FORMER BP STATION #11109
4280 FOOTHILL BOULEVARD
OAKLAND, CALIFORNIA

SITE LOCATION MAP

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FIGURE
1

CITY: PETALUMA, CA DIV/GROUP: ENV DB: J. HARRIS LD:--- PIC:--- PM: H. PHILLIPS TM: B. McKENNA LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Petaluma\ACTIVE\GP09BPNAC106\E0000\GP09BPNAC106-1.dwg LAYOUT: 1SAVED: 11/20/2009 8:30 AM ACADVER: 17.1S (LMS TECH) PAGESETUP: SETUP:1PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 11/20/2009 8:40 AM BY: HARRIS, JESSICA
XREFS: IMAGES: PROJECTNAME: ---
GP09BX01.tif
GP09BX03.tiff

CITY: SAN FRANCISCO DIV/GROUP: ENV/IM DB: KGPETERS LD: PIC: PM: TM:
PROJECT: PATH: H:\GISPROJECTS_ENV\BP_FOXGLOVE\CA\CA11109\GIS\MXD\CA11109_FIGURE_3_GWELEV_20130426.MXD DATE: 4/29/2013 7:14:34 PM

RESIDENTIAL
UNDERGROUND USED OIL TANK
BLOCK WALL
FORMER BP OIL SERVICE STATION BUILDING #11109
BLOCK WALL
MW-2 (NG)
MW-8 (29.05)
MW-6 (30.01)
MW-4 (29.08)
DISPENSER ISLANDS
UNDERGROUND FUEL TANKS
MW-9 (34.06)
MW-7 (32.22)
MW-3 (32.62)
FOOTHILL BLVD.
MW-11 (30.50)
MW-10 (30.31)
MW-12 (30.22)
MW-5 (29.43)
C-1 (28.67)
0.03 FT/FT
RESIDENTIAL
PRIVACY FENCE
HIGH STREET
CAR WASH
UNDERGROUND FUEL TANKS
DISPENSER ISLANDS/ CANOPY
C-10 (29.10)
C-5 (20.27)
C-3 (19.20)
CHEVRON SERVICE STATION
C-2 (24.76)
TREE LINE
HIGH STREET
C-4 (27.52)*
DATA ANOMALOUS WITH HISTORICAL READINGS (HISTORICAL MIN DTW)
C-6 (15.61)
HIGH STREET
C-7 (11.60)
30
32
34
28
26
24
22
20
18
16
14
12

LEGEND:

- GROUNDWATER MONITORING WELL
- GROUNDWATER MONITORING WELL-CHEVRON
- RECOVERY POINT
- (11.60) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- 12 GROUNDWATER ELEVATION CONTOUR LINE (DASHED WHERE INFERRED)
- 0.03 GROUNDWATER FLOW DIRECTION (FOOT PER FOOT)
- * NOT USED FOR CONTOURING
- NG NOT GAUGED

NOTE:
GROUNDWATER ELEVATIONS AT ADJACENT CHEVRON SITE CALCULATED BASED ON FIELD DEPTH TO WATER DATA PROVIDED BY CHEVRON AND TOP OF CASING MEASUREMENTS AVAILABLE ON GEOTRACKER

0 50 100
SCALE IN FEET

NOTES:

1. BASE MAP PROVIDED BY BROADBENT & ASSOCIATES, INC. DATED 10/26/2009, REFERENCE 06-88-646, AT A SCALE OF 1"=40'.

FORMER BP STATION #11109
4280 FOOTHILL BOULEVARD
OAKLAND, CALIFORNIA

GROUNDWATER ELEVATION CONTOUR MAP - MARCH 20, 2013

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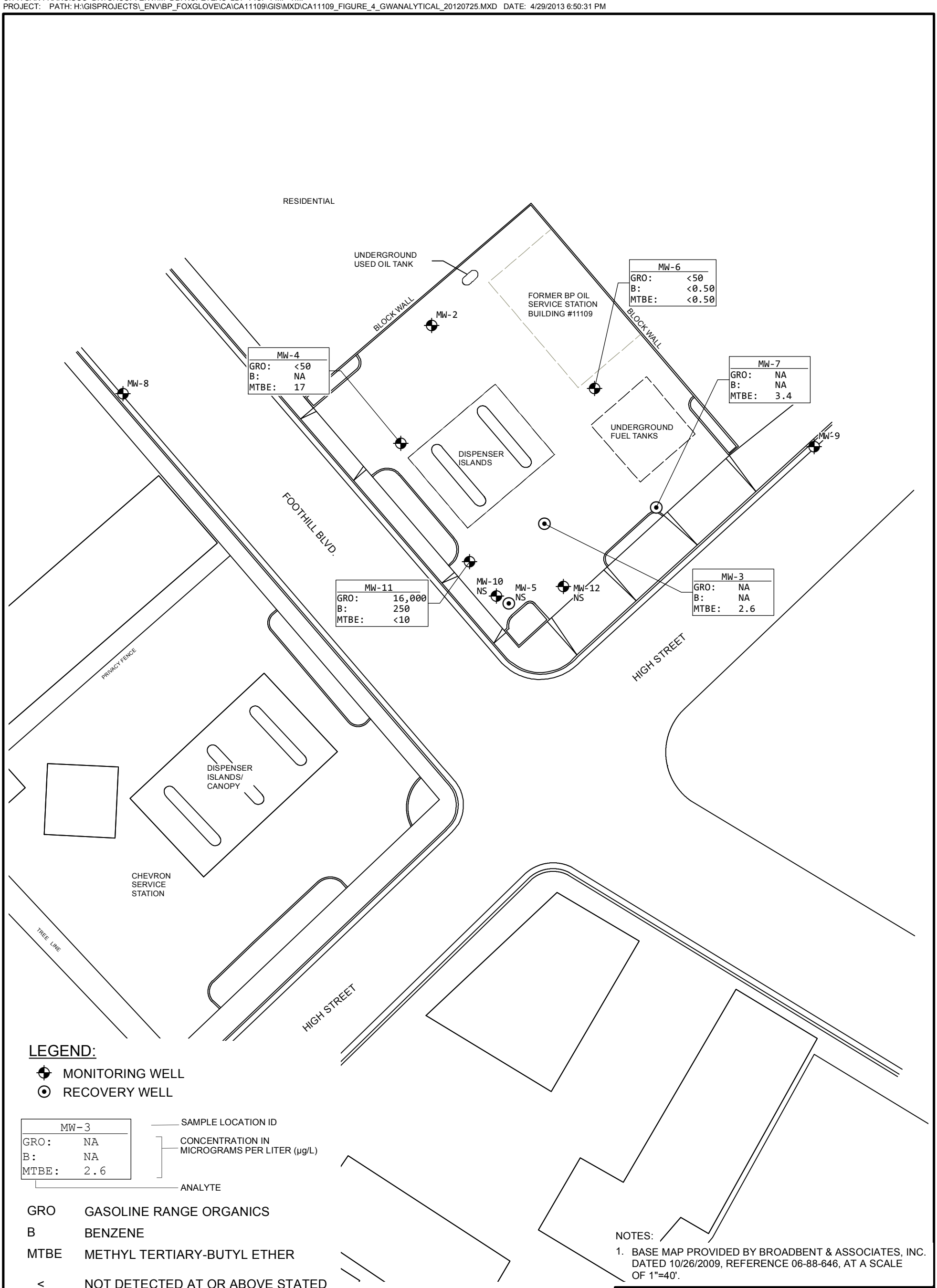
FIGURE 2

CITY: SAN FRANCISCO DIV/GROUP: ENV/IM DB: KGPETERS LD: PIC: PM: TM:
PROJECT: PATH: H:\GISPROJECTS_ENV\BP_FOXGLOVE\CA\CA11109\GIS\MXD\CA11109_FIGURE_4_GWANALYTICAL_20120725.MXD DATE: 4/29/2013 6:50:31 PM



LEGEND:

- MONITORING WELL
- RECOVERY WELL

MW-3	
GRO:	NA
B:	NA
MTBE:	2.6

SAMPLE LOCATION ID

CONCENTRATION IN MICROGRAMS PER LITER (µg/L)

ANALYTE

GRO	GASOLINE RANGE ORGANICS
B	BENZENE
MTBE	METHYL TERTIARY-BUTYL ETHER
<	NOT DETECTED AT OR ABOVE STATED LABORATORY REPORTING LIMIT
NS	NOT SAMPLED
NA	NOT ANALYZED

NOTE:
SAMPLES WERE NOT COLLECTED FROM MONITORING WELLS CONTAINING MEASURABLE FREE PRODUCT.

0 40 80

SCALE IN FEET

NOTES:

1. BASE MAP PROVIDED BY BROADBENT & ASSOCIATES, INC. DATED 10/26/2009, REFERENCE 06-88-646, AT A SCALE OF 1"=40'.

FORMER BP STATION #11109
4280 FOOTHILL BOULEVARD
OAKLAND, CALIFORNIA

ANALYTICAL SUMMARY MAP
MARCH 20, 2013

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FIGURE
3

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Tables

Table 1
Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date	Notes	TOC (ft msl)	DTW (ft)	DTP	GW Elev (ft msl)	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Ethanol (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
MW-1	1/31/1990		38.19	15.41		22.78	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	9/16/2010		--	--		--	--	5,500	400	250	320	410	11	<20	<2.5	<2.5	<2.5	<500	<2.5	<2.5
MW-2	2/5/1990		41.22	21.90		19.32	--	1,300	14	<0.1	9	13	--	--	--	--	--	--	--	--
MW-2	2/14/1991		41.22	21.16		20.06	<10,000	<50	<0.3	<0.3	<0.3	<0.3	--	--	--	--	--	--	--	--
MW-2	5/13/1991		41.22	21.32		19.90	<50	<50	<0.3	<0.3	<0.3	<0.3	--	--	--	--	--	--	--	--
MW-2	7/24/1991		41.22	22.92		18.30	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	10/3/1991		41.22	24.90		16.32	<50	<50	<0.3	0.8	<0.3	<0.3	--	--	--	--	--	--	--	--
MW-2	10/15/1991		41.22	24.10		17.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	12/16/1991		41.22	23.95		17.27	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	1/6/1992		41.22	23.30		17.92	<50	<50	<0.3	<0.3	<0.3	<0.3	--	--	--	--	--	--	--	--
MW-2	1/22/1992		41.22	23.14		18.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	1/28/1992		41.22	22.99		18.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	2/5/1992		41.22	22.63		18.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	2/12/1992		41.22	22.04		19.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	2/17/1992		41.22	20.84		20.38	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	4/3/1992		41.22	18.29		22.93	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	4/8/1992		41.22	18.86		22.36	63	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-2	4/14/1992		41.22	19.45		21.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	4/29/1992		41.22	20.35		20.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	5/7/1992		41.22	20.84		20.38	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	7/3/1992		41.22	22.34		18.88	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-2	10/8/1992		41.22	23.73		17.49	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-2	12/31/1992		41.22	21.12		20.10	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-2	4/21/1993	a	41.22	17.68		23.54	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-2	7/7/1993		41.22	20.30		20.92	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-2	9/21/1993		41.22	21.93		19.29	--	<50	0.9	0.7	0.7	2.6	21.54	--	--	--	--	--	--	--
MW-2	12/17/1993		41.22	21.48		19.74	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	12/23/1993		--	--		--	--	<50	<0.5	<0.5	<0.5	0.7	--	--	--	--	--	--	--	--
MW-2	4/7/1994		41.22	20.25		20.97	--	<50	<0.5	<0.5	<0.5	<0.5	12.2	--	--	--	--	--	--	--
MW-2	7/6/1994		41.22	20.59		20.63	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-2	10/7/1994		41.22	22.04		19.18	--	<50	<0.5	<0.5	<0.5	<0.5	15.2	--	--	--	--	--	--	--
MW-2	1/27/1995		41.22	26.12		15.10	440	<50	<0.5	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--
MW-2	3/30/1995		41.22	12.34		28.88	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--
MW-2	6/20/1995		41.22	16.42		24.80	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--
MW-2	10/3/1995		41.22	20.06		21.16	--	<50	<0.50	<0.50	<0.50	<1.0	<5.0	--	--	--	--	--	--	--
MW-2	12/6/1995		41.22	21.31		19.91	--	<50	<0.50	<0.50	<0.50	<1.0	46	--	--	--	--	--	--	--
MW-2	3/21/1996		41.22	12.28		28.94	--	<50	<0.5	<1.0	<1.0	<1.0	<1.0	--	--	--	--	--	--	--
MW-2	6/21/1996		41.22	13.28		27.94	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-2	9/6/1996		41.22	13.94		27.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	9/9/1996		--	--		--	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-2	12/19/1996		41.22	12.19		29.03	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-2	3/17/1997		41.22	11.59		29.63	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	8/12/1997		41.22	13.21		28.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	12/10/1997		41.22	12.34		28.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	3/12/1998		41.22	11.04		30.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	6/23/1998		41.22	11.77		29.45	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	3/31/1999		41.22	12.38		28.84	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	8/25/1999		41.22	17.72		23.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	3/9/2000		41.22	11.94		29.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	3/8/2001		41.22	10.31		30.91	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	3/8/2002		41.22	14.35		26.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	3/18/2002		41.22	13.11		28.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	3/11/2003		41.22	13.24		27.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	12/9/2003	b	41.22	18.58		22.64	--	350	<0.50	<0.50	0.56	2.8	24	<20	<0.50	<0.50	<0.50	<100	--	--
MW-2	3/9/2004		41.22	12.52		28.70	--	74	<0.50	<0.50	0.83	4.7	27	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-2	9/17/2004		41.22	18.05		23.17	--	59	<0.50	<0.50	<0.50	<0.50	21	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-2	3/7/2005	c	41.22	2.32		38.90	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	9/5/2006	c	41.22	10.46		30.76	--	79	<0.50	5.1	<0.50	0.73	<0.50	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-2	3/5/2007	c	41.22	12.25		28.97	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	3/6/2008	d	41.22	12.33		28.89	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	9/5/2012		--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	9/5/2012		41.22	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	2/5/1990		40.74	17.45		23.29	--	1,400	15	<2.5	11	8	--	--	--	--	--	--	--	--
MW-3	2/14/1991		40.74	18.52		22.22	--	320	8	<0.3	8	1	--	--	--	--	--	--	--	--
MW-3	5/13/1991		40.74	19.32		21.42	--	640	13	<0.3	18	1	--	--	--	--	--	--	--	--
MW-3	7/24/1991		40.74	20.69		20.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	10/3/1991		40.74	19.47		21.27	--	940	21	<0.3	23	2.1	--	--	--	--	--	--	--	--
MW-3	10/15/1991		40.74	20.46		20.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	12/4/1991		40.74	18.29		22.45	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 1
Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date	Notes	TOC (ft msl)	DTW (ft)	DTP	GW Elev (ft msl)	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Ethanol (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
MW-3	12/16/1991		40.74	18.34		22.40	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	1/6/1992		40.74	18.50		22.24	--	580	6.1	1	6.1	7.1	--	--	--	--	--	--	--	--
MW-3	1/22/1992		40.74	17.86		22.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	1/28/1992		40.74	15.84		24.90	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	2/5/1992		40.74	17.53		23.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	2/12/1992		40.74	17.15		23.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	2/17/1992		40.74	16.18		24.56	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	4/3/1992		40.74	14.80		25.94	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	4/8/1992		40.74	17.06		23.68	--	1,100	30	4.6	32	11	--	--	--	--	--	--	--	--
MW-3	4/14/1992		40.74	15.22		25.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	4/29/1992		40.74	15.90		24.84	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	5/7/1992		40.74	16.35		24.39	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	7/3/1992		40.74	17.74		23.00	--	1,200	38	<2.5	24	<2.5	--	--	--	--	--	--	--	--
MW-3	10/8/1992		40.74	19.06		21.68	--	1,400	31	<0.5	25	13	--	--	--	--	--	--	--	--
MW-3	12/31/1992		40.74	16.61		24.13	--	820	12	4.1	13	5.9	--	--	--	--	--	--	--	--
MW-3	12/31/1992	e	40.74	16.61		24.13	--	960	11	3.6	10	3.8	--	--	--	--	--	--	--	--
MW-3	4/21/1993		40.74	14.24		26.50	--	420	5.6	<0.5	3.9	1.4	--	--	--	--	--	--	--	--
MW-3	4/21/1993	e	40.74	14.24		26.50	--	390	5	<0.5	3.7	1.5	--	--	--	--	--	--	--	--
MW-3	7/7/1993	f	40.13	15.19		24.94	--	54	0.6	0.6	<0.5	<0.5	12.68	--	--	--	--	--	--	--
MW-3	9/21/1993		40.13	16.58		23.55	--	540	7.9	0.9	4.7	2.4	--	--	--	--	--	--	--	--
MW-3	12/17/1993		40.13	15.82		24.31	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	12/23/1993		--	--		--	--	500	9.8	1.5	3.3	2.1	--	--	--	--	--	--	--	--
MW-3	12/23/1993	e	--	--		--	--	480	9.2	<0.5	5.4	5.3	--	--	--	--	--	--	--	--
MW-3	4/7/1994		40.13	28.50		11.63	--	460	20	7.4	8.9	11	18.2	--	--	--	--	--	--	--
MW-3	4/7/1994	e	40.13	28.50		11.63	--	460	20	7.7	9	11	--	--	--	--	--	--	--	--
MW-3	7/6/1994		--	--		--	--	300	10	0.6	1.7	6.4	5.54	--	--	--	--	--	--	--
MW-3	10/7/1994		40.13	27.65		12.48	--	620	28	<0.5	2.2	12	31.4	--	--	--	--	--	--	--
MW-3	1/27/1995		40.13	27.65		12.48	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	3/30/1995		40.13	26.05		14.08	--	300	10	6	3.4	18	--	--	--	--	--	--	--	--
MW-3	6/20/1995		40.13	19.49		20.64	--	170	7.2	3.4	0.85	15	--	--	--	--	--	--	--	--
MW-3	10/3/1995		40.13	24.93		15.20	--	170	2.1	<0.50	0.81	8	6.7	--	--	--	--	--	--	--
MW-3	12/6/1995		40.13	25.14		14.99	--	1,700	6.7	3.1	2.8	210	64	--	--	--	--	--	--	--
MW-3	12/6/1995	e	40.13	25.14		14.99	--	1,400	6.1	3	1.7	190	53	--	--	--	--	--	--	--
MW-3	3/21/1996		40.13	9.48		30.65	--	<50	0.5	<1.0	<1.0	1	<10	--	--	--	--	--	--	--
MW-3	6/21/1996		40.13	11.60		28.53	--	<50	13	<1.0	<1.0	<1.0	12	--	--	--	--	--	--	--
MW-3	9/6/1996		40.13	12.23		27.90	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	9/9/1996		--	--		--	--	<250	6.5	<5.0	<5.0	<5.0	<50	--	--	--	--	--	--	--
MW-3	12/19/1996		40.13	10.46		29.67	--	<50	4.1	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-3	3/17/1997		40.13	9.86		30.27	--	50	<5.0	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-3	8/12/1997		40.13	12.11		28.02	--	<50	0.79	<1.0	<1.0	<1.0	10	--	--	--	--	--	--	--
MW-3	12/10/1997		40.13	10.90		29.23	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-3	3/12/1998		40.13	10.20		29.93	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-3	3/12/1998	e	40.13	10.20		29.93	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-3	6/23/1998		40.13	10.17		29.96	--	50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-3	3/31/1999		40.13	11.45		28.68	--	60	<1.0	<1.0	<1.0	<1.0	6.2	--	--	--	--	--	--	--
MW-3	8/25/1999		40.13	12.52		27.61	--	<50	<1.0	<1.0	<1.0	<1.0	7.7	--	--	--	--	--	--	--
MW-3	3/9/2000		40.13	12.39		27.74	--	<50	<0.5	0.54	<0.5	1.7	6.3	--	--	--	--	--	--	--
MW-3	3/8/2001		40.13	10.41		29.72	--	<50	<0.5	<0.5	<0.5	0.59	7.7	--	--	--	--	--	--	--
MW-3	3/8/2002		40.13	9.83		30.30	--	62	<0.5	<0.5	<0.5	<1.0	11.6	--	--	--	--	--	--	--
MW-3	3/18/2002		40.13	9.20		30.93	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	3/11/2003		40.13	10.54		29.59	--	<50	<0.50	<0.50	<0.50	<0.50	6.7	--	--	--	--	--	--	--
MW-3	12/9/2003		40.13	12.88		27.25	--	<50	<0.50	<0.50	<0.50	<0.50	6.4	<20	<0.50	<0.50	<0.50	<100	--	--
MW-3	3/9/2004		40.13	9.49		30.64	--	<50	<0.50	<0.50	<0.50	0.63	6.9	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-3	9/17/2004		40.13	12.76		27.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	3/7/2005		40.13	7.30		32.83	--	<50	<0.50	<0.50	<0.50	0.52	5.1	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-3	9/6/2005		42.92	10.81		32.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	3/6/2006		42.92	8.85		34.07	--	<50	<0.50	<0.50	<0.50	<0.50	6.9	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-3	9/5/2006		42.92	9.86		33.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	3/5/2007		42.92	8.33		34.59	--	<50	<0.50	<0.50	<0.50	<0.50	5.4	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-3	9/7/2007		42.92	11.10		31.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	3/6/2008		42.92	8.92		34.00	--	<50	<0.50	<0.50	<0.50	<0.50	4.2	<10	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-3	9/3/2008		42.92	12.19		30.73	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	3/4/2009		42.92	8.28		34.64	--	<50	<0.50	<0.50	<0.50	<0.50	4.9	<10	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-3	9/30/2009		42.92	11.60		31.32	--	<50	<0.50	<0.50	<0.50	<0.50	6.8	<10	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-3	10/28/2009		42.92	10.40		32.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	3/23/2010		42.92	8.27		34.65	--	<50	<0.50	<0.50	<0.50	<1.0	3.2	<4.0	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-3	6/10/2010		42.92	9.40		33.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	9/16/2010		42.92	11.14		31.78	--	<50	<0.50	<0.50	<0.50	<1.0	5.9	<4.0	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-3	2/23/2011		42.92	8.71		34.21	--	--	--	--	--	--	0.58	--	--	--	--	--	--	--
MW-3	9/28/2011		42.92	11.14		31.78	--	--	--	--	--	--	3.2	--	--	--	--	--	--	--
MW-3	3/8/2012		42.92	11.01		31.91	--	--	--	--	--	--	<0.50(*)	--	--	--	--	--	--	--

Table 1
Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date	Notes	TOC (ft msl)	DTW (ft)	DTP	GW Elev (ft msl)	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Ethanol (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
MW-3	9/5/2012		42.92	11.42		31.50	--	--	--	--	--	--	6.5	--	--	--	--	--	--	--
MW-3	3/20/2013		42.92	10.30	--	32.62	--	--	--	--	--	--	2.6	--	--	--	--	--	--	--
MW-4	2/5/1990		40.11	20.75		19.36	--	620	<0.5	9	<0.5	10	--	--	--	--	--	--	--	--
MW-4	2/14/1991		40.11	21.73		18.38	--	180	<0.3	<0.3	0.4	2	--	--	--	--	--	--	--	--
MW-4	5/13/1991		40.11	18.55		21.56	--	72	0.7	<0.3	<0.3	<0.3	--	--	--	--	--	--	--	--
MW-4	7/24/1991		40.11	21.31		18.80	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	10/3/1991		40.11	22.57		17.54	--	57	<0.3	<0.3	<0.3	<0.3	--	--	--	--	--	--	--	--
MW-4	10/15/1991		40.11	22.88		17.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/4/1991		40.11	22.54		17.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/16/1991		40.11	22.59		17.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	1/6/1992		40.11	22.00		18.11	--	480	0.8	3.2	1.9	7.7	--	--	--	--	--	--	--	--
MW-4	1/22/1992		40.11	21.58		18.53	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	1/28/1992		40.11	21.42		18.69	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	2/5/1992		40.11	21.10		19.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	2/12/1992		40.11	20.74		19.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	2/17/1992		40.11	19.78		20.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	4/3/1992		40.11	16.80		23.31	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	4/8/1992		40.11	17.13		22.98	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-4	4/14/1992		40.11	17.74		22.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	4/29/1992		40.11	18.56		21.55	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	5/7/1992		40.11	19.10		21.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	7/3/1992		40.11	20.71		19.40	--	<50	0.6	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-4	10/8/1992		40.11	22.43		17.68	--	270	<0.5	2.1	2.5	3.2	--	--	--	--	--	--	--	--
MW-4	12/31/1992		40.11	19.58		20.53	--	150	<0.5	<0.5	<0.5	1.3	--	--	--	--	--	--	--	--
MW-4	4/21/1993		40.11	17.79		22.32	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-4	7/7/1993		40.11	18.44		21.67	--	160	1.2	5.4	3.8	19	5.51	--	--	--	--	--	--	--
MW-4	9/21/1993		40.11	20.14		19.97	--	71	<0.5	1.9	<0.5	2.1	--	--	--	--	--	--	--	--
MW-4	12/17/1993		40.11	19.80		20.31	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/23/1993		--	--		--	--	<50	3.1	1.6	0.8	3.8	5.7	--	--	--	--	--	--	--
MW-4	4/7/1994		40.11	19.12		20.99	--	<50	<0.5	<0.5	<0.5	<0.5	11.7	--	--	--	--	--	--	--
MW-4	7/6/1994		40.11	19.90		20.21	--	62	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-4	10/7/1994		40.11	20.07		20.04	--	<50	<0.5	<0.5	<0.5	<0.5	7.38	--	--	--	--	--	--	--
MW-4	1/27/1995		40.11	13.72		26.39	--	<50	<0.5	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--
MW-4	3/30/1995		40.11	11.46		28.65	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--
MW-4	6/20/1995		40.11	14.78		25.33	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--
MW-4	10/3/1995		40.11	19.62		20.49	--	<50	<0.50	<0.50	<0.50	<1.0	5	--	--	--	--	--	--	--
MW-4	12/6/1995		40.11	19.91		20.20	--	<50	<0.50	<0.50	<0.50	<1.0	47	--	--	--	--	--	--	--
MW-4	3/21/1996		40.11	11.12		28.99	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-4	6/21/1996		40.11	12.21		27.90	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-4	9/6/1996		40.11	12.89		27.22	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	9/9/1996		--	--		--	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-4	12/19/1996		40.11	11.01		29.10	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-4	3/17/1997		40.11	10.42		29.69	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	8/12/1997		40.11	12.77		27.34	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/10/1997		40.11	11.22		28.89	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/12/1998		40.11	10.81		29.30	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	6/23/1998		40.11	10.61		29.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/31/1999		40.11	11.46		28.65	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	8/25/1999		40.11	16.16		23.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/9/2000		40.11	12.23		27.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/8/2001		40.11	11.04		29.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/8/2002		40.11	12.73		27.38	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/18/2002		40.11	11.62		28.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/11/2003		40.11	13.44		26.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	12/9/2003		40.11	15.03		25.08	--	<250	<2.5	<2.5	<2.5	<2.5	130	<100	<2.5	<2.5	2.7	<500	--	--
MW-4	3/9/2004		40.11	11.04		29.07	--	<50	<0.50	<0.50	<0.50	<0.50	35	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-4	9/17/2004		40.11	16.75		23.36	--	<250	<2.5	<2.5	<2.5	<2.5	140	<100	<2.5	<2.5	2.6	<500	<2.5	<2.5
MW-4	3/7/2005		40.11	11.02		29.09	--	67	<0.50	<0.50	<0.50	<0.50	42	<20	<0.50	<0.50	0.56	<100	<0.50	<0.50
MW-4	9/6/2005		42.88	14.64		28.24	--	81	<0.50	<0.50	<0.50	<1.5	180	<10	<0.50	<0.50	2.8	<150	<0.50	<0.50
MW-4	3/6/2006		42.88	12.42		30.46	--	<100	<1.0	<1.0	<1.0	<1.0	110	<40	<1.0	<1.0	1.4	<600	<1.0	<1.0
MW-4	9/5/2006		42.88	13.81		29.07	--	130	<1.0	<1.0	<1.0	<1.0	190	<40	<1.0	<1.0	1.7	<600	<1.0	<1.0
MW-4	3/5/2007		42.88	10.63		32.25	--	<50	<0.50	<0.50	<0.50	<0.50	13	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-4	9/7/2007		42.88	14.77		28.11	--	90	<0.50	<0.50	<0.50	<0.50	130	<20	<0.50	<0.50	1.7	<300	<0.50	<0.50
MW-4	3/6/2008		42.88	11.30		31.58	--	<50	<0.50	<0.50	<0.50	<0.50	170	14	<0.50	<0.50	2.1	<300	<0.50	<0.50
MW-4	9/3/2008		42.88	16.11		26.77	--	<50	<5.0	<5.0	<5.0	<5.0	150	<100	<5.0	<5.0	<5.0	<3,000	<5.0	<5.0
MW-4	3/4/2009		42.88	10.78		32.10	--	140	<5.0	<5.0	<5.0	<5.0	110	<100	<5.0	<5.0	<5.0	<3,000	<5.0	<5.0
MW-4	9/30/2009		42.88	16.48		26.40	--	240	<2.0	<2.0	<2.0	<2.0	140	<40	<2.0	<2.0	<2.0	<1,200	<2.0	<2.0
MW-4	10/28/2009		42.88	15.07		27.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4	3/23/2010		42.88	10.82		32.06	--	<50	<0.50	<0.50	<0.50	<1.0	84	18	<0.50	<0.50	0.88	<100	<0.50	<0.50
MW-4	6/10/2010		42.88	12.67		30.21	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 1
Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date	Notes	TOC (ft msl)	DTW (ft)	DTP	GW Elev (ft msl)	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Ethanol (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
MW-4	9/16/2010		42.88	15.72		27.16	--	120	<0.50	<0.50	<0.50	<1.0	72	8.0	<0.50	<0.50	0.82	<100	<0.50	<0.50
MW-4	2/23/2011		42.88	11.43		31.45	--	<50	--	--	--	--	55	--	--	--	--	--	--	--
MW-4	9/28/2011		42.88	15.34		27.54	--	150	--	--	--	--	62	--	--	--	--	--	--	--
MW-4	3/8/2012		42.88	15.03		27.85	--	120	--	--	--	--	42	--	--	--	--	--	--	--
MW-4	9/5/2012		42.88	15.90		26.98	--	56	<0.50	<0.50	<0.50	<1.0	47	18	<0.50	<0.50	<0.50	<250	<0.50	<0.50
MW-4	3/20/2013		42.88	13.80	--	29.08	--	<50	--	--	--	--	17	--	--	--	--	--	--	--
MW-5	10/3/1991		39.55	18.08		21.47	--	79,000	13,000	7,400	1,400	6,200	--	--	--	--	--	--	--	--
MW-5	10/15/1991		39.55	18.55		21.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	12/4/1991	g	39.55	18.44		20.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	12/16/1991	g	39.55	18.66		20.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	1/6/1992	g	39.55	19.12		20.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	1/22/1992		39.55	14.59		24.96	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	1/28/1992		39.55	15.25		24.30	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	2/5/1992	b	39.55	15.58		23.97	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	2/12/1992	g	39.55	15.54		24.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	2/17/1992	b	39.55	13.98		25.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	4/3/1992	g	39.55	13.63		25.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	4/8/1992	g	39.55	13.17		26.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	4/14/1992	g	39.55	13.45		26.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	4/29/1992	g	39.55	13.75		25.73	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	5/7/1992	g	39.55	16.15		23.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	7/3/1992	g	39.55	17.67		21.80	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	9/1/1992	g	39.55	17.83		21.22	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	10/8/1992	g	39.55	17.86		20.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	12/31/1992	b	39.55	15.20		24.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	4/21/1993	g	39.55	12.64		26.89	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	7/7/1993	g,f	39.14	12.68		25.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	9/21/1993	b	39.14	14.35		24.79	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	12/17/1993	g	39.14	12.61		26.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	4/7/1994		39.14	30.00		9.14	--	66,000	3,000	1,700	250	6,800	2,002	--	--	--	--	--	--	--
MW-5	7/6/1994		--	--		--	--	29,000	1,900	330	63	2,700	1,141	--	--	--	--	--	--	--
MW-5	10/7/1994		39.14	28.70		10.44	--	250,000	2,600	660	830	5,200	37.7	--	--	--	--	--	--	--
MW-5	10/7/1994	e	39.14	28.70		10.44	--	45,000	2,900	540	260	2,600	--	--	--	--	--	--	--	--
MW-5	1/27/1995		39.14	28.70		10.44	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	3/30/1995		39.14	28.95		10.19	--	50,000	7,900	2,600	520	6,400	--	--	--	--	--	--	--	--
MW-5	3/30/1995	e	39.14	28.95		10.19	--	43,000	7,900	2,500	440	6,200	--	--	--	--	--	--	--	--
MW-5	6/20/1995		39.14	22.54		16.60	--	34,000	5,100	1,900	300	3,700	--	--	--	--	--	--	--	--
MW-5	6/20/1995	e	39.14	22.54		16.60	--	26,000	3,500	290	<25	3,300	--	--	--	--	--	--	--	--
MW-5	10/3/1995		39.14	18.84		20.30	--	12,000	68	42	11	1,600	330	--	--	--	--	--	--	--
MW-5	10/3/1995	e	39.14	18.84		20.30	--	12,000	46	39	10	1,600	320	--	--	--	--	--	--	--
MW-5	12/6/1995		39.14	19.07		20.07	--	16,000	1,200	93	51	700	600	--	--	--	--	--	--	--
MW-5	3/21/1996		39.14	7.43		31.71	--	1,500	89	28	6	250	<10	--	--	--	--	--	--	--
MW-5	3/21/1996	e	39.14	7.43		31.71	--	1,900	92	30	7	270	<10	--	--	--	--	--	--	--
MW-5	6/21/1996		39.14	9.87		29.27	--	3,500	740	150	19	400	<100	--	--	--	--	--	--	--
MW-5	6/21/1996	e	39.14	9.87		29.27	--	2,700	680	140	20	400	<50	--	--	--	--	--	--	--
MW-5	9/6/1996		39.14	10.52		28.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	9/9/1996		--	--		--	--	82,000	3,100	1,700	850	9,100	<2,500	--	--	--	--	--	--	--
MW-5	9/9/1996	e	--	--		--	--	90,000	2,900	1,600	670	6,900	<2,500	--	--	--	--	--	--	--
MW-5	12/19/1996		39.14	8.62		30.52	--	41,000	790	820	120	2,040	<500	--	--	--	--	--	--	--
MW-5	12/19/1996	e	39.14	8.62		30.52	--	26,000	490	430	63	1,140	<500	--	--	--	--	--	--	--
MW-5	3/17/1997		39.14	8.22		30.92	--	5,500	1.9	2.4	<1.0	<1.0	29	--	--	--	--	--	--	--
MW-5	3/17/1997	e	39.14	8.22		30.92	--	6,600	2.5	2.7	<1.0	<1.0	28	--	--	--	--	--	--	--
MW-5	8/12/1997	g	39.14	12.18		26.74	--	33,000	6,400	2,400	680	4,400	<1,000	--	--	--	--	--	--	--
MW-5	8/12/1997	e	39.14	12.18		26.74	--	36,000	6,100	2,500	720	4,500	<500	--	--	--	--	--	--	--
MW-5	12/10/1997	g	39.14	10.78		28.30	--	31,000	3,000	2,500	560	5,100	500	--	--	--	--	--	--	--
MW-5	12/10/1997	e	39.14	10.78		28.30	--	37,000	2,900	2,500	440	4,800	--	--	--	--	--	--	--	--
MW-5	3/12/1998	g	39.14	10.11		28.81	--	100,000	1,600	870	250	2,600	<250	--	--	--	--	--	--	--
MW-5	6/23/1998		39.14	10.20		28.92	--	27,000	2,500	840	370	2,900	<250	--	--	--	--	--	--	--
MW-5	6/23/1998	e	39.14	10.20		28.92	--	27,000	2,600	840	400	2,950	<500	--	--	--	--	--	--	--
MW-5	8/25/1999	g	39.14	14.69		24.07	--	180,000	2,700	400	830	2,800	26	--	--	--	--	--	--	--
MW-5	3/9/2000	g	39.14	14.83		23.71	--	53,000	12,000	2,600	1,900	9,100	<5.0	--	--	--	--	--	--	--
MW-5	3/8/2002	g	39.14	11.45		26.19	--	33,000	8,240	1,080	1,010	2,900	34.3	--	--	--	--	--	--	--
MW-5	3/18/2002		39.14	8.03		31.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	3/11/2003	g	39.14	9.60		29.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	12/9/2003	g	39.14	11.44		27.72	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	3/9/2004		39.14	7.91		31.23	--	31,000	3,900	1,100	780	3,600	<50	<2,000	<50	<50	<50	<10,000	96	<50
MW-5	9/17/2004	g	39.14	12.13		27.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	3/7/2005	g	39.14	8.62		30.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	9/6/2005	g	39.14	11.16		27.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	3/6/2006	g,b	39.14	8.60		30.54	--	32,000	7,500	810	1,200	2,300	<50	<2,000	60	<50	<50	<30,000	<50	<50

Table 1
Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date	Notes	TOC (ft msl)	DTW (ft)	DTP	GW Elev (ft msl)	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Ethanol (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
MW-5	9/5/2006	g	39.14	6.16		32.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	3/5/2007	b	39.14	8.34		30.80	--	90,000	10,000	4,200	1,900	7,900	<50	<2,000	57	<50	<50	<30,000	<50	<50
MW-5	9/7/2007	g	39.14	15.15		23.99	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	1/14/2008	g	39.14	10.30		28.84	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	2/27/2008	g	39.14	13.22		25.92	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	3/6/2008	g	39.14	12.90		26.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	9/3/2008	g	39.14	12.90		26.24	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	3/4/2009	g	39.14	8.45		30.69	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	4/8/2009	g	39.14	9.05		30.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	5/11/2009	g	39.14	9.10		30.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	6/16/2009	g	39.14	9.15		29.99	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	7/22/2009	g	39.14	9.33		29.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	8/6/2009	g	39.14	10.05		29.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	9/30/2009	g	39.14	10.55		28.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	10/28/2009		39.14	10.48		28.66	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	3/23/2010		39.14	7.10		32.04	--	67,000	1,400	380	620	1,800	<5.0	<40	<5.0	<5.0	<5.0	<1,000	<5.0	<5.0
MW-5	6/10/2010	g	39.14	8.26		30.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	9/16/2010	g	39.14	9.14		30.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	2/23/2011	g	39.14	8.33		30.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	9/28/2011	g	39.14	10.46		28.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	3/8/2012	g	39.14	10.27		28.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	9/5/2012	g	39.14	11.80		27.69	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	3/20/2013	g	39.14	9.73	9.71	29.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	10/3/1991		41.59	20.73		20.86	--	<50	0.7	0.8	<0.3	1.3	--	--	--	--	--	--	--	--
MW-6	10/15/1991		41.59	21.20		20.39	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	12/4/1991		41.59	21.26		20.33	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	12/16/1991		41.59	21.12		20.47	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	1/6/1992		41.59	20.29		21.30	--	<50	<0.5	<0.5	<0.5	1.6	--	--	--	--	--	--	--	--
MW-6	1/22/1992		41.59	20.12		21.47	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	1/28/1992		41.59	20.20		21.39	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	2/5/1992		41.59	20.09		21.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	2/12/1992		41.59	19.15		22.44	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	2/17/1992		41.59	18.02		23.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	4/3/1992		41.59	16.62		24.97	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	4/8/1992		41.59	17.06		24.53	--	<50	0.6	<0.5	0.8	<0.5	--	--	--	--	--	--	--	--
MW-6	4/14/1992		41.59	17.23		24.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	4/29/1992		41.59	18.12		23.47	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	5/7/1992		41.59	18.52		23.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	7/3/1992		41.59	19.71		21.88	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-6	10/8/1992		41.59	21.22		20.37	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-6	10/8/1992	e	41.59	21.22		20.37	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-6	12/31/1992		41.59	21.33		20.26	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-6	4/21/1993		41.59	16.45		25.14	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-6	7/7/1993		41.59	18.68		22.91	--	<50	<0.5	<0.5	<0.5	<0.5	28.96	--	--	--	--	--	--	--
MW-6	9/21/1993		41.59	19.64		21.95	--	<50	<0.5	<0.5	<0.5	1.6	--	--	--	--	--	--	--	--
MW-6	12/17/1993		41.59	21.08		20.51	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	12/23/1993		--	--		--	--	<50	<0.5	0.5	<0.5	0.6	13.95	--	--	--	--	--	--	--
MW-6	4/7/1994		41.59	21.27		20.32	--	<50	<0.5	<0.5	<0.5	<0.5	35.1	--	--	--	--	--	--	--
MW-6	7/6/1994		41.59	19.81		21.78	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-6	7/6/1994	e	41.59	19.81		21.78	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-6	10/7/1994		41.59	21.25		20.34	--	<50	<0.5	<0.5	<0.5	<0.5	24.3	--	--	--	--	--	--	--
MW-6	1/27/1995		41.59	12.39		29.20	--	<50	<0.5	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--
MW-6	3/30/1995		41.59	11.34		30.25	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--
MW-6	6/20/1995		41.59	15.12		26.47	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--
MW-6	10/3/1995		41.59	20.68		20.91	--	<50	<0.50	<0.50	<0.50	<1.0	66	--	--	--	--	--	--	--
MW-6	12/6/1995		41.59	23.77		17.82	--	<50	<0.50	<0.50	<0.50	<1.0	45	--	--	--	--	--	--	--
MW-6	3/21/1996		41.59	11.55		30.04	--	<50	<0.5	<1.0	<1.0	<1.0	41	--	--	--	--	--	--	--
MW-6	6/21/1996		41.59	12.60		28.99	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-6	9/6/1996		41.59	13.25		28.34	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	9/9/1996		--	--		--	--	<50	<0.5	<1.0	<1.0	<1.0	22	--	--	--	--	--	--	--
MW-6	12/19/1996		41.59	11.45		30.14	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-6	3/17/1997		41.59	10.80		30.79	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	8/12/1997		41.59	13.11		28.48	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	12/10/1997		41.59	13.84		27.75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/12/1998		41.59	11.17		30.42	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	6/23/1998		41.59	13.27		28.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/31/1999		41.59	12.91		28.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	8/25/1999		41.59	15.93		25.66	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/9/2000		41.59	11.49		30.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/8/2001		41.59	10.81		30.78	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 1
Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date	Notes	TOC (ft msl)	DTW (ft)	DTP	GW Elev (ft msl)	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Ethanol (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
MW-6	3/8/2002		41.59	14.28		27.31	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/18/2002		41.59	13.10		28.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/11/2003		41.59	13.63		27.96	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	12/9/2003		41.59	14.26		27.33	--	<50	<0.50	<0.50	<0.50	<0.50	12	<20	<0.50	<0.50	<0.50	<100	--	--
MW-6	3/9/2004		41.59	11.87		29.72	--	<50	<0.50	<0.50	<0.50	<0.50	10	<20	<0.50	<0.50	<0.50	<100	0.58	<0.50
MW-6	9/17/2004		41.59	16.45		25.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/7/2005		41.59	13.65		27.94	--	<50	<0.50	<0.50	<0.50	<0.50	5.8	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-6	9/6/2005		44.37	14.23		30.14	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/6/2006		44.37	12.89		31.48	--	<50	<0.50	<0.50	<0.50	<0.50	8.1	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-6	9/5/2006		44.37	14.10		30.27	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/5/2007		44.37	11.43		32.94	--	<50	<0.50	<0.50	<0.50	<0.50	5.6	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-6	9/7/2007		44.37	16.00		28.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/6/2008		44.37	11.84		32.53	--	<50	<0.50	<0.50	<0.50	<0.50	1.9	<10	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-6	9/3/2008		44.37	16.24		28.13	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/4/2009		44.37	11.68		32.69	--	<50	<0.50	<0.50	<0.50	<0.50	2.8	<10	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-6	9/30/2009		44.37	16.83		27.54	--	<50	<0.50	<0.50	<0.50	<0.50	4.4	<10	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-6	10/28/2009		44.37	15.63		28.74	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	3/23/2010		44.37	11.48		32.89	--	<50	<0.50	<0.50	<0.50	<1.0	1.0	<4.0	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-6	6/10/2010		44.37	12.54		31.83	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	9/16/2010		44.37	15.95		28.42	--	<50	<0.50	<0.50	<0.50	<1.0	0.80	<4.0	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-6	2/23/2011		44.37	12.34		32.03	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--
MW-6	9/28/2011		44.37	15.81		28.56	--	--	--	--	--	--	3.4	--	--	--	--	--	--	--
MW-6	3/8/2012		44.37	15.51		28.86	--	--	--	--	--	--	0.58	--	--	--	--	--	--	--
MW-6	9/5/2012		44.37	15.88		28.49	--	--	--	--	--	--	2.1	--	--	--	--	--	--	--
MW-6	3/20/2013		44.37	14.36	--	30.01	--	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<4.0	<0.50	<0.50	<0.50	<250	<0.50	<0.50
MW-7	10/3/1991		40.64	14.93		25.71	--	360	62	13	3.4	20	--	--	--	--	--	--	--	--
MW-7	10/15/1991		40.64	15.16		25.48	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	12/4/1991		40.64	15.41		25.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	12/16/1991		40.64	15.21		25.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	1/6/1992		40.64	14.56		26.08	--	1,100	170	<0.5	24	23	--	--	--	--	--	--	--	--
MW-7	1/22/1992		40.64	14.63		26.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	1/28/1992		40.64	14.73		25.91	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	2/5/1992		40.64	14.58		26.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	2/12/1992		40.64	13.94		26.70	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	2/17/1992		40.64	13.10		27.54	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	4/3/1992		40.64	12.66		27.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	4/8/1992		40.64	12.77		27.87	--	750	150	<0.5	23	9.9	--	--	--	--	--	--	--	--
MW-7	4/14/1992		40.64	13.02		27.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	4/29/1992		40.64	13.59		27.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	5/7/1992		40.64	13.95		26.69	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	7/3/1992		40.64	14.73		25.91	--	660	210	<2.5	33	8	--	--	--	--	--	--	--	--
MW-7	10/8/1992		40.64	15.75		24.89	--	320	49	1.4	13	6.2	--	--	--	--	--	--	--	--
MW-7	12/31/1992		40.64	13.57		27.07	--	900	100	<2.5	28	4.3	--	--	--	--	--	--	--	--
MW-7	4/21/1993		40.64	14.56		26.08	--	510	83	1.2	10	5.8	--	--	--	--	--	--	--	--
MW-7	7/7/1993	f	40.32	13.40		26.92	--	1,100	160	2	27	4	10.84	--	--	--	--	--	--	--
MW-7	7/7/1993	e	40.32	13.40		26.92	--	1,100	170	1.9	29	2.84	9.84	--	--	--	--	--	--	--
MW-7	9/21/1993		40.32	14.40		25.92	--	690	150	3.1	26	5.7	--	--	--	--	--	--	--	--
MW-7	9/21/1993	e	40.32	14.40		25.92	--	640	140	1.7	23	2.4	--	--	--	--	--	--	--	--
MW-7	12/17/1993		40.32	13.65		26.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	12/23/1993		--	--		--	--	250	64	1.2	9	1.8	7.81	--	--	--	--	--	--	--
MW-7	4/7/1994		40.32	30.62		9.70	--	140	32	1.4	<0.5	<0.5	6.32	--	--	--	--	--	--	--
MW-7	7/6/1994		40.32	16.88		23.44	--	410	94	1.3	10	3.5	<5.0	--	--	--	--	--	--	--
MW-7	10/7/1994		40.32	25.59		14.73	--	<50	9.2	<0.5	<0.5	<0.5	<5.0	--	--	--	--	--	--	--
MW-7	1/27/1995		40.32	9.82		30.50	--	810	570	3	60	17	--	--	--	--	--	--	--	--
MW-7	1/27/1995	e	40.32	9.82		30.50	--	930	620	4	77	21	--	--	--	--	--	--	--	--
MW-7	3/30/1995		40.32	9.15		31.17	--	180	65	0.53	2	<1.0	--	--	--	--	--	--	--	--
MW-7	6/20/1995		40.32	11.38		28.94	--	2,800	980	<5.0	<5.0	43	--	--	--	--	--	--	--	--
MW-7	10/3/1995		40.32	29.95		10.37	--	<50	<0.50	<0.50	<0.50	<1.0	<5.0	--	--	--	--	--	--	--
MW-7	12/6/1995		40.32	29.85		10.47	--	<50	<0.50	<0.50	<0.50	<1.0	<5.0	--	--	--	--	--	--	--
MW-7	3/21/1996		40.32	9.76		30.56	--	1,000	390	2	40	13	<10	--	--	--	--	--	--	--
MW-7	6/21/1996		40.32	11.01		29.31	--	<250	40	<5.0	<5.0	<5.0	<50	--	--	--	--	--	--	--
MW-7	9/6/1996		40.32	11.68		28.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	9/9/1996		--	--		--	--	<250	13	<5.0	<5.0	<5.0	<50	--	--	--	--	--	--	--
MW-7	12/19/1996		40.32	10.78		29.54	--	70	1.2	<1.0	1	<1.0	<10	--	--	--	--	--	--	--
MW-7	3/17/1997		40.32	9.96		30.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	8/12/1997		40.32	11.44		28.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	12/10/1997		40.32	10.42		29.90	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	3/12/1998		40.32	9.51		30.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	6/23/1998		40.32	9.98		30.34	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	3/31/1999		40.32	10.38		29.94	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 1
Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date	Notes	TOC (ft msl)	DTW (ft)	DTP	GW Elev (ft msl)	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Ethanol (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
MW-7	8/25/1999		40.32	12.38		27.94	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	3/9/2000		40.32	8.48		31.84	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	3/8/2001		40.32	8.37		31.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	3/18/2002		40.32	9.94		30.38	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	3/11/2003		40.32	11.26		29.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	12/9/2003		40.32	12.76		27.56	--	270	26	<0.50	<0.50	<0.50	8.7	<20	<0.50	<0.50	<0.50	<100	--	--
MW-7	3/9/2004		40.32	10.91		29.41	--	320	49	0.73	1.8	0.59	6.9	<20	<0.50	<0.50	<0.50	<100	1.2	<0.50
MW-7	9/17/2004		40.32	13.20		27.12	--	330	17	<0.50	<0.50	<0.50	7.0	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-7	3/7/2005		40.32	8.18		32.14	--	340	41	0.79	0.79	0.73	7.2	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-7	9/6/2005		43.10	11.80		31.30	--	1,100	130	1.2	1.8	<1.5	16	30	0.60	<0.50	<0.50	<150	<0.50	<0.50
MW-7	3/6/2006		43.10	8.39		34.71	--	440	31	0.78	0.74	0.81	8.3	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-7	9/5/2006		43.10	11.45		31.65	--	2,000	260	3.1	5.9	<2.5	12	<100	<2.5	<2.5	<2.5	<1,500	<2.5	<2.5
MW-7	3/5/2007		43.10	9.31		33.79	--	2,200	110	2.2	4.0	1.8	7.6	<40	<1.0	<1.0	<1.0	<600	<1.0	<1.0
MW-7	9/7/2007		43.10	12.18		30.92	--	220	8.4	<0.50	<0.50	<0.50	1.2	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-7	3/6/2008		43.10	10.05		33.05	--	1,800	54	1.2	1.1	<1.0	<1.0	<20	<1.0	<1.0	<1.0	<600	<1.0	<1.0
MW-7	9/3/2008		43.10	13.17		29.93	--	540	13	0.69	<0.50	<0.50	5.5	17	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-7	3/4/2009		43.10	8.25		34.85	--	720	15	0.59	0.53	<0.50	3.4	12	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-7	9/30/2009		43.10	12.70		30.40	--	1,200	44	1.0	0.74	0.79	3.3	<10	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-7	10/28/2009		43.10	11.17		31.93	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	3/23/2010		43.10	9.28		33.82	--	610	11	<0.50	<0.50	<1.0	<0.50	12	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-7	6/10/2010		43.10	10.24		32.86	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-7	9/16/2010		43.10	12.16		30.94	--	4,700	130	<5.0	7.4	<10	<5.0	<40	<5.0	<5.0	<5.0	<1,000	<5.0	<5.0
MW-7	2/23/2011		43.10	9.62		33.48	--	2,200	26	1.1	1.4	1.6	4.0	<4.0	<0.50	<0.50	<0.50	<250	<0.50	<0.50
MW-7	9/28/2011		43.10	11.80		31.30	--	3,800	380	4.8	28	4.3	9.5	13	<0.50	<0.50	<0.50	<250	<0.50	<0.50
MW-7	3/8/2012		43.10	11.69		31.41	--	550	1.4	<0.50	<0.50	<1.0	2.3	<4.0	<0.50	<0.50	<0.50	<250	<0.50	<0.50
MW-7	9/5/2012		43.10	11.60		31.50	--	830	16	1.3	0.66	1.4	3.0	<4.0	<0.50	<0.50	<0.50	<250	<0.50	<0.50
MW-7	3/20/2013		43.10	10.88	--	32.22	--	--	--	--	3.4	--	--	--	--	--	--	--	--	--
MW-8	10/3/1991		38.18	22.37		15.81	--	<50	<0.3	0.6	<0.3	0.9	--	--	--	--	--	--	--	--
MW-8	10/15/1991		38.18	22.70		15.48	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	12/4/1991		38.18	22.44		15.74	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	12/16/1991		38.18	22.47		15.71	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	1/6/1992		38.18	21.94		16.24	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-8	1/22/1992		38.18	21.44		16.74	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	1/28/1992		38.18	21.20		16.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	2/5/1992		38.18	20.88		17.30	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	2/12/1992		38.18	20.54		17.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	2/17/1992		38.18	19.99		18.19	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	4/3/1992		38.18	16.75		21.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	4/8/1992		38.18	16.57		21.61	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-8	4/29/1992		38.18	18.61		19.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	5/7/1992		38.18	18.41		19.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	7/3/1992		38.18	20.35		17.83	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-8	10/8/1992		38.18	21.74		16.44	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	12/31/1992		38.18	19.09		19.09	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-8	4/21/1993		38.18	18.92		19.26	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-8	7/7/1993		38.18	17.76		20.42	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--	--	--	--	--	--	--
MW-8	9/21/1993		38.18	19.71		18.47	--	<50	2.9	2.2	2.2	7.1	--	--	--	--	--	--	--	--
MW-8	12/17/1993		38.18	21.33		16.85	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	12/23/1993		--	--		--	--	<50	<0.5	<0.5	<0.5	0.6	<5.0	--	--	--	--	--	--	--
MW-8	4/7/1994		38.18	21.51		16.67	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--	--	--	--	--	--	--
MW-8	7/6/1994		38.18	17.41		20.77	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--	--	--	--	--	--	--
MW-8	10/7/1994		38.18	19.20		18.98	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--	--	--	--	--	--	--
MW-8	1/27/1995		38.18	12.25		25.93	--	<50	<0.5	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--
MW-8	3/30/1995		38.18	10.35		27.83	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--
MW-8	6/20/1995		38.18	13.37		24.81	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--
MW-8	12/6/1995		38.18	18.42		19.76	--	<50	<0.50	<0.50	<0.50	<1.0	47	--	--	--	--	--	--	--
MW-8	6/21/1996		38.18	13.03		25.15	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-8	9/6/1996		38.18	13.70		24.48	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	9/9/1996		--	--		--	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-8	12/19/1996		38.18	11.93		26.25	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-8	3/17/1997		38.18	11.29		26.89	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	8/12/1997		38.18	13.73		24.45	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	12/10/1997		38.18	11.88		26.30	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/12/1998		38.18	11.89		26.29	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	6/23/1998		38.18	11.33		26.85	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/31/1999		38.18	12.68		25.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	8/25/1999		38.18	14.93		23.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/9/2000		38.18	9.14		29.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/8/2001		38.18	8.41		29.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/8/2002		38.18	11.18		27.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 1
Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date	Notes	TOC (ft msl)	DTW (ft)	DTP	GW Elev (ft msl)	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Ethanol (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
MW-8	3/18/2002		38.18	10.72		27.46	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/11/2003		38.18	10.46		27.72	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/9/2004		38.18	9.79		28.39	--	<50	<0.50	<0.50	<0.50	<0.50	0.50	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-8	9/17/2004		38.18	15.35		22.83	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/7/2005		38.18	7.94		30.24	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-8	9/6/2005		40.95	13.06		27.89	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/6/2006		40.95	9.26		31.69	--	<50	<0.50	<0.50	<0.50	<0.50	0.59	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-8	9/5/2006		40.95	12.61		28.34	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/5/2007		40.95	9.12		31.83	--	<50	<0.50	<0.50	<0.50	0.53	<0.50	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-8	9/7/2007		40.95	13.56		27.39	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/6/2008		40.95	9.80		31.15	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-8	9/3/2008		40.95	14.20		26.75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/4/2009		40.95	9.51		31.44	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-8	9/30/2009		40.95	14.92		26.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	10/28/2009		40.95	13.56		27.39	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	6/10/2010		40.95	11.06		29.89	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	9/16/2010		40.95	14.41		26.54	--	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<4.0	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-8	9/28/2011		40.95	13.87		27.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/8/2012		40.95	13.27		27.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	9/5/2012		40.95	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-8	3/20/2013		40.95	11.90	--	29.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	10/3/1991		41.25	14.12		27.13	--	<50	<0.3	0.4	<0.3	<0.3	--	--	--	--	--	--	--	--
MW-9	10/15/1991		41.25	14.27		26.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	12/4/1991		41.25	13.84		27.41	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	12/16/1991		41.25	14.18		27.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	1/6/1992		41.25	13.42		27.83	--	<50	<0.5	<0.5	<0.5	0.9	--	--	--	--	--	--	--	--
MW-9	1/22/1992		41.25	13.75		27.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	1/28/1992		41.25	14.76		26.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	2/5/1992		41.25	13.38		27.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	2/12/1992		41.25	11.86		29.39	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	2/17/1992		41.25	10.78		30.47	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	4/3/1992		41.25	11.63		29.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	4/8/1992		41.25	12.25		29.00	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-9	4/14/1992		41.25	12.32		28.93	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	4/29/1992		41.25	13.07		28.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	5/7/1992		41.25	14.43		26.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	7/3/1992		41.25	13.85		27.40	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-9	10/8/1992		41.25	14.89		26.36	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-9	12/31/1992		41.25	11.90		29.35	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-9	4/21/1993		41.25	13.68		27.57	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-9	7/7/1993		41.25	13.12		28.13	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--	--	--	--	--	--	--
MW-9	9/21/1993		41.25	14.00		27.25	--	<50	<0.5	<0.5	<0.5	0.9	--	--	--	--	--	--	--	--
MW-9	12/17/1993		41.25	12.98		28.27	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	12/23/1993		--	--		--	--	<50	<0.5	<0.5	<0.5	0.9	<5.0	--	--	--	--	--	--	--
MW-9	4/7/1994		41.25	13.24		28.01	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--	--	--	--	--	--	--
MW-9	7/6/1994		41.25	13.77		27.48	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--
MW-9	10/7/1994		41.25	14.60		26.65	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--	--	--	--	--	--	--
MW-9	1/27/1995		41.25	8.47		32.78	--	<50	<0.5	<0.5	<0.5	<1.0	--	--	--	--	--	--	--	--
MW-9	3/30/1995		41.25	8.19		33.06	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--
MW-9	6/20/1995		41.25	11.25		30.00	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--
MW-9	10/3/1995		41.25	14.68		26.57	--	<50	<0.50	<0.50	<0.50	<1.0	<5.0	--	--	--	--	--	--	--
MW-9	12/6/1995		41.25	16.07		25.18	--	<50	<0.50	<0.50	<0.50	<1.0	46	--	--	--	--	--	--	--
MW-9	3/21/1996		41.25	9.60		31.65	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-9	6/21/1996		41.25	10.86		30.39	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-9	9/6/1996		41.25	11.52		29.73	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	9/9/1996		--	--		--	--	<50	<0.5	<1.0	<1.0	<1.0	21	--	--	--	--	--	--	--
MW-9	12/19/1996		41.25	10.43		30.82	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	--	--	--	--	--	--
MW-9	3/17/1997		41.25	9.87		31.38	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	8/12/1997		41.25	11.44		29.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	12/10/1997		41.25	10.44		30.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/12/1998		41.25	9.50		31.75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	6/23/1998		41.25	10.06		31.19	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/31/1999		41.25	9.06		32.19	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	8/25/1999		41.25	12.00		29.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/9/2000		41.25	10.57		30.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/8/2001		41.25	9.73		31.52	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/8/2002		41.25	11.89		29.36	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/18/2002		41.25	9.68		31.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/11/2003		41.25	9.21		32.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/9/2004		41.25	10.99		30.26	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50

Table 1
Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date	Notes	TOC (ft msl)	DTW (ft)	DTP	GW Elev (ft msl)	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Ethanol (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
MW-9	9/17/2004		41.25	13.35		27.90	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/7/2005		41.25	8.94		32.31	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<20	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-9	9/6/2005		44.06	11.99		32.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/6/2006		44.06	8.26		35.80	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-9	9/5/2006		44.06	11.63		32.43	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/5/2007		44.06	9.33		34.73	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<20	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-9	9/7/2007		44.06	12.28		31.78	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/6/2008		44.06	10.11		33.95	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-9	9/3/2008		44.06	13.49		30.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/4/2009		44.06	8.15		35.91	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<10	<0.50	<0.50	<0.50	<300	<0.50	<0.50
MW-9	9/30/2009		44.06	12.98		31.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	10/28/2009		44.06	11.98		32.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/23/2010		44.06	10.59		33.47	--	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<4.0	<0.50	<0.50	<0.50	<100	<0.50	<0.50
MW-9	6/10/2010		44.06	10.25		33.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	2/23/2011		44.06	9.71		34.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	9/28/2011		44.06	11.66		32.40	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/8/2012		44.06	11.56		32.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	9/5/2012		44.06	11.18		32.88	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-9	3/20/2013		44.06	10.00	--	34.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	6/16/2009	g	39.78	8.60		31.19	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	7/22/2009	g	39.78	9.68		30.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	8/6/2009		39.78	9.48		30.30	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	9/30/2009	g	39.78	9.69		30.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	10/28/2009		39.78	8.53		31.25	--	62,000	8,300	5,300	3,100	12,000	<50	<400	<50	<50	<50	<10,000	<50	<50
MW-10	3/23/2010	b	39.78	7.70		32.08	--	59,000	6,500	4,800	2,300	9,700	<100	<800	<100	<100	<100	<20,000	<100	<100
MW-10	6/10/2010	g	39.78	8.93		30.86	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	9/16/2010	g	39.78	9.69		30.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	2/23/2011		39.78	7.99		31.79	--	61,000	7,000	5,300	2,800	12,000	<100	<800	<100	<100	<100	<50,000	<100	<100
MW-10	9/28/2011	g	39.78	10.36		29.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	3/8/2012	g	39.78	10.51		29.51	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	9/5/2012	g	39.78	10.25		29.54	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-10	3/20/2013	g	39.78	9.48	9.47	30.31	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-11	9/30/2009		40.04	10.55		29.49	--	30,000	850	1,400	1,000	3,700	27	<200	<10	<10	<10	<6,000	<10	<10
MW-11	10/28/2009		40.04	8.00		32.04	--	27,000	1,100	2,300	1,500	5,800	<50	<400	<50	<50	<50	<10,000	<50	<50
MW-11	3/23/2010		40.04	7.25		32.79	--	21,000	530	830	790	2,200	<25	<200	<25	<25	<25	<5,000	<25	<25
MW-11	6/10/2010	b	40.04	9.65		30.39	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-11	9/16/2010		40.04	9.42		30.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-11	2/23/2011		40.04	7.60		32.44	--	10,000	380	260	330	540	7.2	<40	<5.0	<5.0	<5.0	<2,500	<5.0	<5.0
MW-11	9/28/2011		40.04	9.88		30.16	--	5,900	230	92	260	370	6.4	26	<2.5	<2.5	<2.5	<1,300	<2.5	<2.5
MW-11	3/8/2012		40.04	9.71		30.33	--	5,000	280	170	250	380	<5.0	<40	<5.0	<5.0	<5.0	<2,500	<5.0	<5.0
MW-11	9/5/2012		40.04	10.60		29.44	--	22,000	1,000	1,600	1,200	4,500	6.2	<40	<5.0	<5.0	<5.0	<2,500	<5.0	<5.0
MW-11	3/20/2013	i	40.04	9.54	--	30.50	--	16,000	250	620	680	2,200	<10	<80	<10	<10	<10	<5,000	<10	<10
MW-12	9/30/2009		40.32	11.02		29.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	10/28/2009		40.32	10.40		29.92	--	43,000	5,800	800	2,900	6,800	<50	<400	<50	<50	<50	<10,000	<50	<50
MW-12	3/23/2010	b	40.32	11.46		28.86	--	39,000	4,800	1,000	3,100	6,400	<25	<200	<25	<25	<25	<5,000	<25	<25
MW-12	6/10/2010	b	40.32	11.35		29.87	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	9/16/2010	g	40.32	11.54		28.80	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	2/23/2011	g	40.32	10.80		29.60	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	9/28/2011	g	40.32	11.48		28.99	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	3/8/2012	g	40.32	11.92		28.64	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	9/5/2012	g	40.32	11.63		29.76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-12	3/20/2013	g	40.32	10.13	10.09	30.22	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

1,2-DCA = 1,2-Dichloroethane
DIPE = Di-isopropyl ether
DO= Dissolved oxygen
DRO = Diesel range organics, range C10-C28
DTW = Depth to water in ft bgs
EDB = 1,2-Dibromomethane
ETBE = Ethyl tert butyl ether
GRO = Gasoline range organics, range C4-C12
GWE = Groundwater measured in ft
MTBE = Methyl tert butyl ether
TAME = Ter-amyl methyl ether
TBA = Ter-butyl alcohol
TOC = Top of casing measured in ft

Table 1
Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date	Notes	TOC (ft msl)	DTW (ft)	DTP	GW Elev (ft msl)	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	Ethanol (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)

µg/L= Micrograms per liter
ft bgs = Feet below ground surface
--- = Not analyzed/applicable/measured/ available
< = Not detected at or above reported detection limit
(a) Sample exceeded EPA recommened holding time
(b) Sheen in well
(c) Well not sampled due to damage during site construction
(d) Insufficient water to sample
(e) Blind duplicate
(f) TOC lowered
(g) Free product in well
(h) Trip Blank
(i) Hydrocarbon odor observed at wellhead

GWE adjusted assuming specific gravity of 0.75 for free product
Beginning in the fourth quarter 2003, the laboratory modified the reported analyte list. TPH-g was changed to GRO. The resulting data may be impacted by the potential of non-TPH-g analytes within the requested fuel range resulting in a higher concentration being reported.

Beginning in the second quarter 2004, the carbon range for GRO was changed from C6-C10 to C4-C12.
GRO analysis was completed by EPA method 8260B (C4-C12) for samples collected from the time period April 2006 through February 4, 2008. The analysis for GRO was changed to EPA method 8015B (C6-C12) for samples collected from the time period February 5, 2008 through the present.

The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information.

Table 2
Historical Groundwater Flow Direction and Gradient
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Date Measured	Approximate Gradient Direction	Approximate Gradient Magnitude (ft/ft)
3/6/2006	Southwest	0.05
9/5/2006	Southwest	0.05
2/21/2007	Southwest	0.02
9/7/2007	Southwest	0.03
3/6/2008	Southwest	0.01
9/3/2008	Southwest	0.006
3/4/2009	Southwest	0.02
9/30/2009	Northwest	0.07
10/28/2009	Northwest	0.04
3/23/2010	Northwest	0.03
6/10/2010	Northwest	0.02
9/16/2010	Northwest	0.07
2/23/2011	Northwest	0.04
9/28/2011	Northwest	0.02
3/8/2012	Northwest	0.06
9/5/2012	West-Northwest	0.04
3/20/2013	Southwest	0.03

Notes:

N/A = Not Available
ft/ft = Feet per foot
Note: All data collected following April 2006 was collected by Broadbent & Associates, Inc. The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants.

Table 3
Summary of LNAPL Removal
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date of Removal Event	DTW (feet)	Product Thickness (feet)	Product Removed (gallons)	Cumulative Product Removed (gallons)
MW-5	11/5/1992	--	--	0.200	0.200
MW-5	2/25/1993	--	--	0.100	0.300
MW-5	3/18/1993	--	--	0.100	0.400
MW-5	4/13/1993	--	--	0.100	0.500
MW-5	4/23/1993	--	--	13.0*	13.500
MW-5	5/24/1993	--	--	0.100	13.600
MW-5	10/14/1993	--	--	0.300	13.900
MW-5	11/10/1993	--	--	0.400	14.300
MW-5	12/23/1993	--	--	0.400	14.700
MW-5	8/12/1997	12.18	0.22	--	14.700
MW-5	12/10/1997	10.78	0.06	--	14.700
MW-5	3/12/1998	10.11	0.22	0.200	14.900
MW-5	6/23/1998	10.20	0.02	<0.050	14.900
MW-5	9/11/1998	11.61	0.04	0.100	15.000
MW-5	8/25/1999	14.69	0.38	0.070	15.070
MW-5	3/9/2000	14.83	0.60	0.400	15.470
MW-5	7/14/2003	12.72	0.03	0.019	15.489
MW-5	8/25/2003	14.04	0.00	0.000	15.489
MW-5	9/25/2003	14.38	0.08	0.052	15.542
MW-5	10/3/2003	12.15	0.06	0.040	15.582
MW-5	11/12/2003	12.74	0.19	0.120	15.702
MW-5	12/9/2003	11.44	0.03	0.040	15.742
MW-5	2/2/2004	6.47	0.04	0.030	15.772
MW-5	2/9/2004	10.61	0.04	0.030	15.802
MW-5	3/9/2004	7.91	--	--	15.802
MW-5	4/13/2004	9.68	0.28	0.200	16.002
MW-5	5/5/2004	11.93	Sheen	--	16.002
MW-5	6/3/2004	12.60	Sheen	--	16.002
MW-5	7/2/2004	11.11	0.10	0.060	16.062
MW-5	8/31/2004	12.80	0.05	0.132	16.194
MW-5	9/17/2004	12.13	0.15	--	16.194
MW-5	10/25/2004	10.66	0.26	0.170	16.364
MW-5	11/8/2004	9.98	0.02	0.020	16.384
MW-5	12/15/2004	8.76	0.01	0.010	16.394
MW-5	1/13/2005	7.12	--	--	16.394
MW-5	2/1/2005	8.10	0.01	0.007	16.400
MW-5	3/7/2005	8.62	0.02	0.013	16.413
MW-5	4/29/2005	9.39	--	--	16.413
MW-5	5/12/2005	7.51	0.01	0.007	16.420
MW-5	6/23/2005	7.70	--	--	16.420
MW-5	7/2/2005	10.81	--	--	16.420
MW-5	8/24/2005	10.53	--	--	16.420
MW-5	9/6/2005	11.16	0.18	0.119	16.539
MW-5	1/27/2006	9.02	0.02	0.013	16.433
MW-5	2/15/2006	8.38	0.02	0.013	16.446
MW-5	3/6/2006	8.60	Sheen	--	16.446
MW-5	4/21/2006	8.02	0.27	0.251	16.697
MW-5	5/30/2006	9.13	0.07	0.045	16.742
MW-5	6/27/2006	9.49	0.09	0.058	16.801
MW-5	7/31/2006	10.08	0.08	0.052	16.853
MW-5	8/28/2006	10.75	0.09	0.059	16.911
MW-5	9/5/2006	6.16	0.03	0.020	16.931
MW-5	10/1/2006	--	--	--	16.931
MW-5	11/1/2006	--	--	--	16.931
MW-5	12/1/2006	--	--	--	16.931
MW-5	1/1/2007	--	--	--	16.931
MW-5	2/1/2007	--	--	--	16.931
MW-5	3/5/2007	8.34	Sheen	--	16.931
MW-5	4/1/2007	--	--	--	16.931
MW-5	5/1/2007	--	--	--	16.931
MW-5	6/1/2007	--	--	--	16.931
MW-5	7/1/2007	--	--	--	16.931
MW-5	8/1/2007	--	--	--	16.931
MW-5	9/7/2007	15.15	0.15	--	16.931
MW-5	9/12/2007	15.42	0.02	4.00*	20.931
MW-5	10/17/2007	12.50	0.35	5.5*	26.431

Table 3
Summary of LNAPL Removal
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date of Removal Event	DTW (feet)	Product Thickness (feet)	Product Removed (gallons)	Cumulative Product Removed (gallons)
MW-5	11/8/2007	13.20	0.40	5.0*	31.431
MW-5	12/12/2007	12.25	0.52	3.5*	34.931
MW-5	1/14/2008	10.30	0.49	5.0*	39.931
MW-5	2/27/2008	13.22	0.12	4.0*	43.931
MW-5	3/6/2008	12.90	0.14	3.0*	46.931
MW-5	4/1/2008	9.52	0.07	4.0*	50.931
MW-5	5/20/2008	8.68	0.07	7.0*	57.931
MW-5	6/18/2008	10.46	0.18	0.00	57.931
MW-5	7/16/2008	11.25	0.00	0.0375	57.968
MW-5	8/13/2008	--	--	2.125*	60.093
MW-5	9/3/2008	12.90	0.99	3.0*	63.093
MW-5	9/15/2008	12.75	0.15	4.0*	67.093
MW-5	10/15/2008	13.43	0.50	5.0*	72.093
MW-5	11/20/2008	13.55	0.63	2.625*	74.718
MW-5	12/18/2008	12.62	0.37	3.625*	78.343
MW-5	1/14/2009	12.43	0.11	4.0*	82.343
MW-5	2/17/2009	8.80	0.33	4.0*	86.343
MW-5	3/4/2009	8.46	0.16	4.0*	90.343
MW-5	4/8/2009	9.05	0.22	6.0*	96.343
MW-5	5/11/2009	9.10	0.32	8.0*	104.343
MW-5	6/16/2009	9.15	0.02	5.5*	109.843
MW-5	7/22/2009	9.33	0.12	6.0*	115.843
MW-5	8/6/2009	10.05	0.01	5.0*	120.843
MW-5	9/30/2009	10.55	0.06	8.0*	128.843
MW-5	10/28/2009	10.48	0.00	0	128.843
MW-5	11/13/2009	8.61	0.01	0.5*	129.343
MW-5	12/11/2009	7.83	0.01	1.0*	130.343
MW-5	1/26/2010	6.43	0.02	1.5*	131.843
MW-5	2/24/2010	6.72	0.02	2.0*	133.843
MW-5	3/23/2010	7.10	0.00	0	133.843
MW-5	4/19/2010	7.53	Sheen	0	133.843
MW-5	5/18/2010	8.96	Sheen	0	133.843
MW-5	6/10/2010	8.26	0.06	2.0*	135.843
MW-5	7/27/2010	8.60	0.09	1.5*	137.343
MW-5	8/31/2010	8.99	0.01	0	137.343
MW-5	9/16/2010	9.14	0.04	0	137.343
MW-5	10/26/2010	9.40	0.05	2.0*	139.343
MW-5	11/15/2010	9.50	0.01	0.5*	139.843
MW-5	12/15/2011	6.52	0.00	0	139.843
MW-5	1/31/2011	9.31	0.01	0.5*	140.343
MW-5	2/23/2011	8.33	0.01	0	140.343
MW-5	3/18/2011	7.65	Sheen	0	140.343
MW-5	9/28/2011	10.46	0.06	0	140.343
MW-5	3/8/2012	10.27	0.03	2.5	142.843
MW-5	9/13/2012	11.41	1.21	0.72	143.562
MW-5	**11/7/2012**	**10.30**	**0.17**	**2.5***	**146.062**
MW-5	**12/5/2012**	**7.20**	**0.02**	**1.***	**147.062**
MW-5	**1/9/2013**	**8.04**	**0.01**	**0.5***	**147.562**
MW-5	**3/20/2013**	**9.73**	**0.02**	**0.53***	**148.091**
MW-10	6/16/2009	8.60	0.01	2.5*	2.500
MW-10	7/22/2009	9.68	0.01	3.0*	5.500
MW-10	8/6/2009	9.48	0.00	0	5.500
MW-10	9/30/2009	9.69	0.01	3.0*	8.500
MW-10	10/28/2009	8.53	0.00	0	8.500
MW-10	11/13/2009	9.11	0.00	0	8.500
MW-10	12/11/2009	8.81	0.00	0	8.500
MW-10	1/26/2010	7.86	0.01	0.5*	9.000
MW-10	2/24/2010	7.28	0.00	0	9.000
MW-10	3/23/2010	7.70	0.00	0	9.000
MW-10	4/19/2010	8.10	0.00	0	9.000
MW-10	5/18/2010	8.83	0.00	0	9.000
MW-10	6/10/2010	8.93	0.01	2.0*	11.000

Table 3
Summary of LNAPL Removal
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date of Removal Event	DTW (feet)	Product Thickness (feet)	Product Removed (gallons)	Cumulative Product Removed (gallons)
MW-10	7/27/2010	8.81	0.00	0	11.000
MW-10	8/31/2010	9.41	0.00	0	11.000
MW-10	9/16/2010	9.69	0.01	0	11.000
MW-10	10/26/2010	9.98	0.03	1.0*	12.000
MW-10	11/15/2010	10.15	0.00	0	12.000
MW-10	12/15/2010	8.71	0.00	0	12.000
MW-10	1/31/2011	9.05	0.00	0	12.000
MW-10	2/23/2011	7.99	0.00	0	12.000
MW-10	3/18/2011	8.10	0.00	0	12.000
MW-10	9/28/2011	10.36	0.29	0	12.000
MW-10	3/8/2012	10.51	0.32	4.5	16.500
MW-10	9/13/2012	10.73	0.01	0.0	16.507
MW-10	**11/7/2012**	**9.87**	**Sheen**	**0**	**16.507**
MW-10	**12/5/2012**	**6.95**	**0.00**	**0**	**16.507**
MW-10	**1/9/2013**	**7.71**	**0.00**	**0**	**16.507**
MW-10	**3/20/2013**	**9.48**	**0.01**	**0.26***	**16.771**
MW-11	10/28/2009	8.00	0.00	0	0.000
MW-11	11/13/2009	9.24	0.00	0	0.000
MW-11	12/11/2009	9.06	0.00	0	0.000
MW-11	1/26/2010	6.98	0.00	0	0.000
MW-11	2/24/2010	7.07	0.00	0	0.000
MW-11	3/23/2010	7.25	0.00	0	0.000
MW-11	4/19/2010	7.95	0.00	0	0.000
MW-11	5/18/2010	8.26	0.00	0	0.000
MW-11	6/10/2010	9.65	Sheen	2.0*	2.000
MW-11	7/27/2010	8.61	0.00	0	2.000
MW-11	8/31/2010	9.35	0.00	0	2.000
MW-11	9/16/2010	9.42	0.00	0	2.000
MW-11	10/26/2010	9.90	0.00	0	2.000
MW-11	11/15/2010	10.00	0.00	0	2.000
MW-11	12/15/2010	8.51	0.00	0	2.000
MW-11	1/31/2011	9.07	0.00	0	2.000
MW-11	2/23/2011	7.60	0.00	0.00	2.000
MW-11	3/18/2011	7.01	0.00	0	2.000
MW-11	9/28/2011	9.88	0.00	0	2.000
MW-11	3/8/2012	9.71	0.00	0	2.000
MW-11	**9/5/2012**	**10.6**	**Sheen**	**0**	**2.000**
MW-12	9/30/2009	11.01	0.02	4.0*	4.000
MW-12	10/28/2009	10.40	0.00	0	4.000
MW-12	11/13/2009	10.13	0.00	0	4.000
MW-12	12/11/2009	10.22	0.00	0	4.000
MW-12	1/26/2010	8.67	0.00	0	4.000
MW-12	2/24/2010	10.21	0.00	0	4.000
MW-12	3/23/2010	11.16	Sheen	0	4.000
MW-12	4/19/2010	11.52	Sheen	0.5*	4.500
MW-12	5/18/2010	11.50	0.00	0	4.500
MW-12	6/10/2010	11.35	Sheen	1.0*	5.500
MW-12	7/27/2010	10.65	0.01	0.5*	6.000
MW-12	8/31/2010	10.71	0.10	1	7.000
MW-12	9/16/2010	11.54	0.02	0	7.000
MW-12	10/26/2010	11.35	0.02	1.0*	8.000
MW-12	11/15/2010	11.48	0.02	0.5*	8.500
MW-12	12/15/2010	12.78	0.00	0	8.500
MW-12	1/31/2011	11.45	0.01	0.5*	9.000
MW-12	2/23/2011	10.80	0.10	0	9.000
MW-12	3/18/2011	11.40	Sheen	0	9.000
MW-12	9/28/2011	11.48	0.20	0	9.000
MW-12	3/8/2012	11.92	0.32	4.5	13.500
MW-12	9/13/2012	11.72	1.30	0.72	14.219
MW-12	**11/7/2012**	**10.56**	**0.52**	**3.5***	**17.719**
MW-12	**12/5/2012**	**8.00**	**0.08**	**1.0***	**18.719**

Table 3
Summary of LNAPL Removal
CA-11109
4280 Foothill Blvd., Oakland, CA 94601

Well ID	Date of Removal Event	DTW (feet)	Product Thickness (feet)	Product Removed (gallons)	Cumulative Product Removed (gallons)
MW-12	1/9/2013	8.52	0.06	1.5*	20.219
MW-12	3/20/2013	10.13	0.04	0.53*	20.748
				Free Product Removed this Reporting Period:	11.321*
				Total Free Product Removed:	187.609

ACRONYMS:
-- = Not available/applicable/measured/calculated
* = FP/water mixture

NOTES:

All data collected following April 2006 was collected by Broadbent & Associates, Inc. The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants.

ARCADIS

Appendix A

Field Methods

QUALITY ASSURANCE/QUALITY CONTROL
FIELD METHODS

Field methods discussed herein were implemented to provide for accuracy and reliability of field activities, data collection, sample collection, and handling. Discussion of these methods is provided below.

1.0 Equipment Calibration

Equipment calibration was performed per equipment manufacturer specifications before use.

2.0 Depth to Groundwater and Light Non-Aqueous Phase Liquid Measurement

Depth to groundwater was measured in wells identified for gauging in the scope of work using a decontaminated water level indicator. The depth to water measurement was taken from a cut notch or permanent mark at the top of the well casing to which the well head elevation was originally surveyed.

Once depth to water was measured, an oil/water interface meter or a new disposable bailer was utilized to evaluate the presence and, if present, to measure the "apparent" thickness of light non-aqueous phase liquid (LNAPL) in the well. If LNAPL was present in the well, groundwater purging and sampling were not performed, unless sampling procedures in the scope of work specified collection of samples in the presence of LNAPL. Otherwise, time allowing, LNAPL was bailed from the well using either a new disposable bailer, or the disposal bailer previously used for initial LNAPL assessment. Bailing of LNAPL continued until the thickness of LNAPL (or volume) stabilized in each bailer pulled from the well, or LNAPL was no longer present. After LNAPL thickness either stabilized or was eliminated, periodic depth to water and depth to LNAPL measurements were collected as product came back into the well to evaluate product recovery rate and to aid in further assessment of LNAPL in the subsurface. LNAPL thickness measurements were recorded as "apparent." If a bailer was used for LNAPL thickness measurement, the field sampler noted the bailer entry diameter and chamber diameter to enable correction of thickness measurements. Recovered LNAPL was stored on-site in a labeled steel drum(s) or other appropriate container(s) prior to disposal.

3.0 Well Purging and Groundwater Sample Collection

Well purging and groundwater sampling were performed in wells specified in the scope of work after measuring depth to groundwater and evaluating the presence of LNAPL. Purging and sampling were performed using one of the methods detailed below. The method used was noted in the field records. Purge water was stored on-site in labeled steel drum(s) or other appropriate container(s) prior to disposal or on-site treatment (in cases where treatment using an on-site system is authorized).

3.1 Purging a Predetermined Well Volume

Purging a predetermined well volume is performed per ASTM International (ASTM) D4448-01. This purging method has the objective of removing a predetermined volume of stagnant water from the well prior to sampling. The volume of stagnant water

is defined as either the volume of water contained within the well casing, or the volume within the well casing and sand/gravel in the annulus if natural flow through these is deemed insufficient to keep them flushed out.

This purging method involves removal of a minimum of three stagnant water volumes from the well using a decontaminated pump with new disposable plastic discharge or suction tubing, dedicated well tubing, or using a new disposable or decontaminated reusable bailer. If a new disposable bailer was used for assessment of LNAPL, that bailer may be used for purging. The withdrawal rate used is one that minimizes drawdown while satisfying time constraints.

To evaluate when purging is complete, one or more groundwater stabilization parameters are monitored and recorded during purging activities until stabilization is achieved. Most commonly, stabilization parameters include temperature, conductivity, and pH, but field procedures detailed in the scope of work may also include monitoring of dissolved oxygen concentrations, oxidation reduction potential, and/or turbidity[1]. Parameters are considered stable when two (2) consecutive readings recorded three (3) minutes apart fall within ranges provided below in Table 1. In the event that the parameters have not stabilized and five (5) well casing volumes have been removed, purging activities will cease and be considered complete. Once the well is purged, a groundwater sample(s) is collected from the well using a new disposable bailer. If a new disposable bailer was used for purging, that bailer may be used to collect the sample(s). A sample is not collected if the well is inadvertently purged dry.

Table 1. Criteria for Defining Stabilization of Water-Quality Indicator Parameters

Parameter	Stabilization Criterion
Temperature	± 0.2ºC (± 0.36ºF)
pH	± 0.1 standard units
Conductivity	± 3%
Dissolved oxygen	± 10%
Oxidation reduction potential	± 10 mV
Turbidity[1]	± 10% or 1.0 NTU (whichever is greater)

3.2 Low-Flow Purging and Sampling

“Low-Flow”, “Minimal Drawdown”, or "Low-Stress” purging is performed per ASTM D6771-02. It is a method of groundwater removal from within a well’s screened interval that is intended to minimize drawdown and mixing of the water column in the well casing. This is accomplished by pumping the well using a decontaminated pump with new disposable plastic discharge or suction tubing or dedicated well tubing at a low flow rate while evaluating the groundwater elevation during pumping.

[1] As stated in ASTM D6771-02, turbidity is not a chemical parameter and not indicative of when formation-quality water is being purged; however, turbidity may be helpful in evaluating stress on the formation during purging. Turbidity measurements are taken at the same time that stabilization parameter measurements are made, or, at a minimum, once when purging is initiated and again just prior to sample collection, after stabilization parameters have stabilized. To avoid artifacts in sample analysis, turbidity should be as low as possible when samples are collected. If turbidity values are persistently high, the withdrawal rate is lowered until turbidity decreases. If high turbidity persists even after lowering the withdrawal rate, the purging is stopped for a period of time until turbidity settles, and the purging process is then restarted. If this fails to solve the problem, the purging/sampling process for the well is ceased, and well maintenance or redevelopment is considered.

The low flow pumping rate is well specific and is generally established at a volume that is less than or equal to the natural recovery rate of the well. A pump with adjustable flow rate control is positioned with the intake at or near the mid-point of the submerged well screen. The pumping rate used during low-flow purging is low enough to minimize mobilization of particulate matter and drawdown (stress) of the water column. Low-flow purging rates will vary based on the individual well characteristics; however, the purge rate should not exceed 1.0 Liter per minute (L/min) or 0.25 gallon per minute (gal/min). Low-flow purging should begin at a rate of approximately 0.1 L/min (0.03 gal/min)[2], or the lowest rate possible, and be adjusted based on an evaluation of drawdown. Water level measurements should be recorded at approximate one (1) to two (2) minute intervals until the low-flow rate has been established, and drawdown is minimized. As a general rule, drawdown should not exceed 25% of the distance between the top of the water column and the pump in-take.

To evaluate when purging is complete, one or more groundwater stabilization parameters are monitored and recorded during purging activities until stabilization is achieved. Most commonly, stabilization parameters include temperature, conductivity, and pH, but field procedures detailed in the scope of work may also include monitoring of dissolved oxygen concentrations, oxidation reduction potential, and/or turbidity[1]. The frequency between measurements will be at an interval of one (1) to three (3) minutes; however, if a flow cell is used, the frequency will be determined based on the time required to evacuate one cell volume. Stabilization is defined as three (3) consecutive readings recorded several minutes apart falling within ranges provided in Table 1. Samples will be collected by filling appropriate containers from the pump discharge tubing at a rate not to exceed the established pumping rate.

3.3 Minimal Purge, Discrete Depth, and Passive Sampling

Per ASTM D4448-01, sampling techniques that do not rely on purging, or require only minimal purging, may be used if a particular zone within a screened interval is to be sampled or if a well is not capable of yielding sufficient groundwater for purging. To properly use these sampling techniques, a water sample is collected within the screened interval with little or no mixing of the water column within the casing. These techniques include minimal purge sampling which uses a dedicated sampling pump capable of pumping rates of less than 0.1 L/min (0.03 gal/min)[2], discrete depth sampling using a bailer that allows groundwater entry at a controlled depth (e.g. differential pressure bailer), or passive (diffusion) sampling. These techniques are based on certain studies referenced in ASTM D4448-01 that indicate that under certain conditions, natural groundwater flow is laminar and horizontal with little or no mixing within the well screen.

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[2] According to ASTM D4448-01, studies have indicated that at flow rates of 0.1 L/min, low-density polyethylene (LDPE) and plasticized polypropylene tubing materials are prone to sorption. Therefore, TFE-fluorocarbon or other appropriate tubing material is used, particularly when tubing lengths of 50 feet or longer are used.

4.0 Decontamination

Reusable groundwater sampling equipment were cleaned using a solution of Alconox or other acceptable detergent, rinsed with tap water, and finally rinsed with distilled water prior to use in each well. Decontamination water was stored on-site in labeled steel drum(s) or other appropriate container(s) prior to disposal.

5.0 Sample Containers, Labeling, and Storage

Samples were collected in laboratory prepared containers with appropriate preservative (if preservative was required). Samples were properly labeled (site name, sample I.D., sampler initials, date, and time of collection) and stored chilled (refrigerator or ice chest with ice) until delivery to a certified laboratory, under chain of custody procedures.

6.0 Chain of Custody Record and Procedure

The field sampler was personally responsible for care and custody of the samples collected until they were properly transferred to another party. To document custody and transfer of samples, a Chain of Custody Record was prepared. The Chain of Custody Record provided identification of the samples corresponding to sample labels and specified analyses to be performed by the laboratory. The original Chain of Custody Record accompanied the shipment, and a copy of the record was stored in the project file. When the samples were transferred, the individuals relinquishing and receiving them signed, dated, and noted the time of transfer on the record.

7.0 Field Records

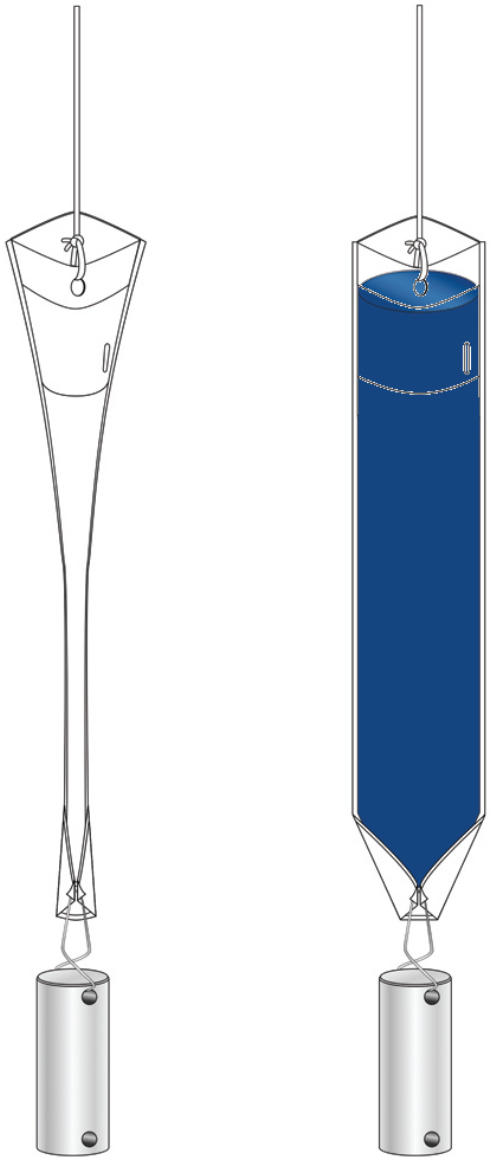
Daily Report and data forms were completed by staff personnel to provide daily record of significant events, observations, and measurements. Field records were signed, dated, and stored in the project file.

HYDRASleeve™

Simple by Design

US Patent No. 6,481,300; No. 6,837,120 others pending

Standard Operating Procedure: Sampling Ground Water with a HydraSleeve



This Guide should be used in addition to field manuals appropriate to sampling device (i.e., HydraSleeve or Super Sleeve).

Find the appropriate field manual on the HydraSleeve website at http://www.hydrasleeve.com.

For more information about the HydraSleeve, or if you have questions, contact: GeoInsight, 2007 Glass Road, Las Cruces, NM 88005, 1-800-996-2225, info@hydrasleeve.com.

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Table of Contents

Introduction

The HydraSleeve is classified as a no-purge (passive) grab sampling device, meaning that it is used to collect ground-water samples directly from the screened interval of a well without having to purge the well prior to sample collection. When it is used as described in this Standard Operating Procedure (SOP), the HydraSleeve causes no drawdown in the well (until the sample is withdrawn from the water column) and only minimal disturbance of the water column, because it has a very thin cross section and it displaces very little water (<100 ml) during deployment in the well. The HydraSleeve collects a sample from within the screen only, and it excludes water from any other part of the water column in the well through the use of a self-sealing check valve at the top of the sampler. It is a single-use (disposable) sampler that is not intended for reuse, so there are no decontamination requirements for the sampler itself.

The use of no-purge sampling as a means of collecting representative ground-water samples depends on the natural movement of ground water (under ambient hydraulic head) from the formation adjacent to the well screen through the screen. Robin and Gillham (1987) demonstrated the existence of a dynamic equilibrium between the water in a formation and the water in a well screen installed in that formation, which results in formation-quality water being available in the well screen for sampling at all times. No-purge sampling devices like the HydraSleeve collect this formation-quality water as the sample, under undisturbed (non-pumping) natural flow conditions. Samples collected in this manner generally provide more conservative (i.e., higher concentration) values than samples collected using well-volume purging, and values equivalent to samples collected using low-flow purging and sampling (Parsons, 2005).

Applications of the HydraSleeve

The HydraSleeve can be used to collect representative samples of ground water for all analytes (volatile organic compounds [VOCs], semi-volatile organic compounds [SVOCs], common metals, trace metals, major cations and anions, dissolved gases, total dissolved solids, radionuclides, pesticides, PCBs, explosive compounds, and all other analytical parameters). Designs are available to collect samples from wells from 1” inside diameter and larger. The HydraSleeve can collect samples from wells of any yield, but it is especially well-suited to collecting samples from low-yield wells, where other sampling methods can’t be used reliably because their use results in dewatering of the well screen and alteration of sample chemistry (McAlary and Barker, 1987).

The HydraSleeve can collect samples from wells of any depth, and it can be used for single-event sampling or long-term ground-water monitoring programs. Because of its thin cross section and flexible construction, it can be used in narrow, constricted or damaged wells where rigid sampling devices may not fit. Using multiple HydraSleeves deployed in series along a single suspension line or tether, it is also possible to conduct in-well vertical profiling in wells in which contaminant concentrations are thought to be stratified.

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As with all groundwater sampling devices, HydraSleeves should not be used to collect groundwater samples from wells in which separate (non-aqueous) phase hydrocarbons (i.e., gasoline, diesel fuel or jet fuel) are present because of the possibility of incorporating some of the separate-phase hydrocarbon into the sample.

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Description of the HydraSleeve

The HydraSleeve (Figure 1) consists of the following basic components:

- A suspension line or tether (A.), attached to the spring clip or directly to the top of the sleeve to deploy the device into and recover the device from the well. Tethers with depth indicators marked in 1-foot intervals are available from the manufacturer.
- A long, flexible, 4-mil thick lay-flat polyethylene sample sleeve (C.) sealed at the bottom (this is the sample chamber), which comes in different sizes, as discussed below with a self-sealing reed-type flexible polyethylene check valve built into the top of the sleeve (B.) to prevent water from entering or exiting the sampler except during sample acquisition.
- A reusable stainless-steel weight with clip (D.), which is attached to the bottom of the sleeve to carry it down the well to its intended depth in the water column. Bottom weights available from the manufacturer are 0.75" OD and are available in three sizes: 5 oz. (2.5" long); 8 oz. (4" long); and 16 oz. (8" long). In lieu of a bottom weight, an optional top weight may be attached to the top of the HydraSleeve to carry it to depth and to compress it at the bottom of the well (not shown in Figure 1);
- A discharge tube that is used to puncture the HydraSleeve after it is recovered from the well so the sample can be decanted into sample bottles (not shown).
- Just above the self-sealing check valve at the top of the sleeve are two holes which provide attachment points for the spring clip and/or suspension line or tether. At the bottom of the sample sleeve are two holes which provide attachment points for the weight clip and weight.

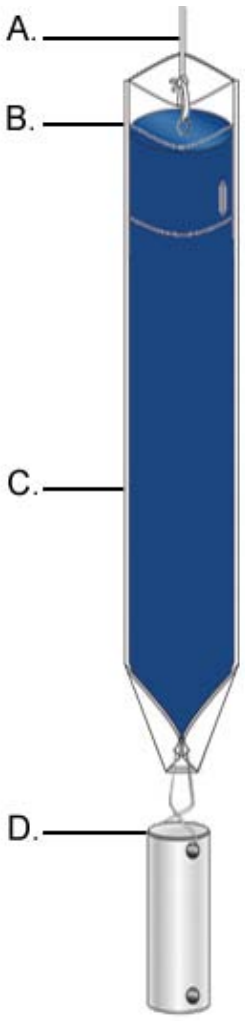

Figure 1. HydraSleeve components.

Note: The sample sleeve and the discharge tube are designed for one-time use and are disposable. The spring clip, weight and weight clip may be reused after thorough cleaning. Suspension cord is generally disposed after one use although, if it is dedicated to the well, it may be reused at the discretion of the sampling personnel.

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Selecting the HydraSleeve Size to Meet Site-Specific Sampling Objectives

It is important to understand that each HydraSleeve is able to collect a finite volume of sample because, after the HydraSleeve is deployed, you only get one chance to collect an undisturbed sample. Thus, the volume of sample required to meet your site-specific sampling and analytical requirements will dictate the size of HydraSleeve you need to meet these requirements.

The volume of sample collected by the HydraSleeve varies with the diameter and length of the HydraSleeve. Dimensions and volumes of available HydraSleeve models are detailed in Table 1.

Table 1. Dimensions and volumes of HydraSleeve models.

Diameter	Volume	Length	Lay-Flat Width	Filled Dia.
2-Inch HydraSleeves				
Standard 625-ml HydraSleeve	625 ml	< 30”	2.5”	1.4”
Standard 1-Liter HydraSleeve	1 Liter	38”	3”	1.9”
1-Liter HydraSleeve SS	1 Liter	36”	3”	1.9”
2-Liter HydraSleeve SS	2 Liters	60”	3”	1.9”
4-Inch HydraSleeves				
Standard 1.6-Liter HydraSleeve	1.6 Liters	30”	3.8”	2.3”
Custom 2-Liter HydraSleeve	2 Liters	36”	4”	2.7”

HydraSleeves can be custom-fabricated by the manufacturer in varying diameters and lengths to meet specific volume requirements. HydraSleeves can also be deployed in series (i.e., multiple HydraSleeves attached to one tether) to collect additional sample to meet specific volume requirements, as described below.

If you have questions regarding the availability of sufficient volume of sample to satisfy laboratory requirements for analysis, it is recommended that you contact the laboratory to discuss the minimum volumes needed for each suite of analytes. Laboratories often require only 10% to 25% of the volume they specify to complete analysis for specific suites of analytes, so they can often work with much smaller sample volumes that can easily be supplied by a HydraSleeve.

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HydraSleeve Deployment

Information Required Before Deploying a HydraSleeve

Before installing a HydraSleeve in any well, you will need to know the following:

- The inside diameter of the well
- The length of the well screen
- The water level in the well
- The position of the well screen in the well
- The total depth of the well

The inside diameter of the well is used to determine the appropriate HydraSleeve diameter for use in the well. The other information is used to determine the proper placement of the HydraSleeve in the well to collect a representative sample from the screen (see HydraSleeve Placement, below), and to determine the appropriate length of tether to attach to the HydraSleeve to deploy it at the appropriate position in the well.

Most of this information (with the exception of the water level) should be available from the well log; if not, it will have to be collected by some other means. The inside diameter of the well can be measured at the top of the well casing, and the total depth of the well can be measured by sounding the bottom of the well with a weighted tape. The position and length of the well screen may have to be determined using a down-hole camera if a well log is not available. The water level in the well can be measured using any commonly available water-level gauge.

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HydraSleeve Placement

The HydraSleeve is designed to collect a sample directly from the well screen, and it fills by pulling it up through the screen a distance equivalent to 1 to 1.5 times its length. This upward motion causes the top check valve to open, which allows the device to fill. To optimize sample recovery, it is recommended that the HydraSleeve be placed in the well so that the bottom weight rests on the bottom of the well and the top of the HydraSleeve is as close to the bottom of the well screen as possible. This should allow the sampler to fill before the top of the device reaches the top of the screen as it is pulled up through the water column, and ensure that only water from the screen is collected as the sample. In short-screen wells, or wells with a short water column, it may be necessary to use a top-weight on the HydraSleeve to compress it in the bottom of the well so that, when it is recovered, it has room to fill before it reaches the top of the screen.

Example

2" ID PVC well, 50' total depth, 10' screen at the bottom of the well, with water level above the screen (the entire screen contains water).

Correct Placement (figure 2): Using a standard HydraSleeve for a 2" well (2.6" flat width/1.5" filled OD x 30" long, 650 ml volume), deploy the sampler so the weight (an 8 oz., 4"-long weight with a 2"-long clip) rests at the bottom of the well. The top of the sleeve is thus set at about 36" above the bottom of the well. When the sampler is recovered, it will be pulled upward approximately 30" to 45" before it is filled; therefore, it is full (and the top check valve closes) at approximately 66" (5 ½ feet) to 81" (6 ¾ feet) above the bottom of the well, which is well before the sampler reaches the top of the screen. In this example, only water from the screen is collected as a sample.

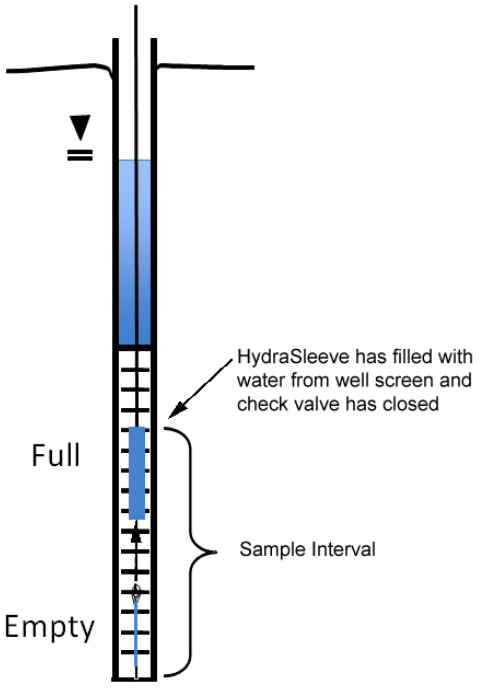

Figure 2. Correct placement of HydraSleeve.

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Incorrect Placement (figure 3): If the well screen in this example was only 5' long, and the HydraSleeve was placed as above, it would not fill before the top of the device reached the top of the well screen, so the sample would include water from above the screen, which may not have the same chemistry.

The solution? Deploy the HydraSleeve with a top weight, so that it is collapsed to within 6" to 9" of the bottom of the well. When the HydraSleeve is recovered, it will fill within 39" (3 ¼ feet) to 54" (4 ½ feet) above the bottom of the well, or just before the sampler reaches the top of the screen, so it collects only water from the screen as the sample.

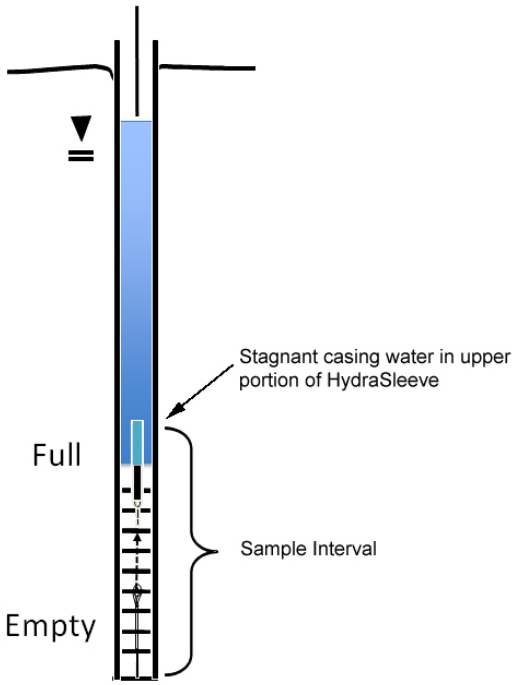

Figure 3. Incorrect placement of HydraSleeve.

This example illustrates one of many types of HydraSleeve placements. More complex placements are discussed in a later section.

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Procedures for Sampling with the HydraSleeve

Collecting a ground-water sample with a HydraSleeve is a simple one-person operation.

Note: Before deploying the HydraSleeve in the well, collect the depth-to-water measurement that you will use to determine the preferred position of the HydraSleeve in the well. This measurement may also be used with measurements from other wells to create a ground-water contour map. If necessary, also measure the depth to the bottom of the well to verify actual well depth to confirm your decision on placement of the HydraSleeve in the water column.

Measure the correct amount of tether needed to suspend the HydraSleeve in the well so that the weight will rest on the bottom of the well (or at your preferred position in the well). Make sure to account for the need to leave a few feet of tether at the top of the well to allow recovery of the sleeve

Note: Always wear sterile gloves when handling and discharging the HydraSleeve.

I. Assembling the HydraSleeve

1. Remove the HydraSleeve from its packaging, unfold it, and hold it by its top.

2. Crimp the top of the HydraSleeve by folding the hard polyethylene reinforcing strips at the holes.

3. Attach the spring clip to the holes to ensure that the top will remain open until the sampler is retrieved.

4. Attach the tether to the spring clip by tying a knot in the tether.

Note: Alternatively, attach the tether to one (NOT both) of the holes at the top of the Hydrasleeve by tying a knot in the tether.

5. Fold the flaps with the two holes at the bottom of the HydraSleeve together and slide the weight clip through the holes.

6. Attach a weight to the bottom of the weight clip to ensure that the HydraSleeve will descend to the bottom of the well.

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II. Deploying the HydraSleeve

1. Using the tether, carefully lower the HydraSleeve to the bottom of the well, or to your preferred depth in the water column

   During installation, hydrostatic pressure in the water column will keep the self-sealing check valve at the top of the HydraSleeve closed, and ensure that it retains its flat, empty profile for an indefinite period prior to recovery.

Note: Make sure that it is not pulled upward at any time during its descent. If the HydraSleeve is pulled upward at a rate greater than 0.5'/second at any time prior to recovery, the top check valve will open and water will enter the HydraSleeve prematurely.

2. Secure the tether at the top of the well by placing the well cap on the top of the well casing and over the tether.

Note: Alternatively, you can tie the tether to a hook on the bottom of the well cap (you will need to leave a few inches of slack in the line to avoid pulling the sampler up as the cap is removed at the next sampling event).

III. Equilibrating the Well

The equilibration time is the time it takes for conditions in the water column (primarily flow dynamics and contaminant distribution) to restabilize after vertical mixing occurs (caused by installation of a sampling device in the well).

- Situation: The HydraSleeve is deployed for the first time or for only one time in a well

  The HydraSleeve is very thin in cross section and displaces very little water (<100 ml) during deployment so, unlike most other sampling devices, it does not disturb the water column to the point at which long equilibration times are necessary to ensure recovery of a representative sample.

  In most cases, the HydraSleeve can be recovered immediately (with no equilibration time) or within a few hours. In regulatory jurisdictions that impose specific requirements for equilibration times prior to recovery of no-purge sampling devices, these requirements should be followed.

- Situation: The HydraSleeve is being deployed for recovery during a future sampling event

  In periodic (i.e., quarterly or semi-annual) sampling programs, the sampler for the current sampling event can be recovered and a new sampler (for the next sampling event)

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deployed immediately thereafter, so the new sampler remains in the well until the next sampling event.

Thus, a long equilibration time is ensured and, at the next sampling event, the sampler can be recovered immediately. This means that separate mobilizations, to deploy and then to recover the sampler, are not required. HydraSleeves can be left in a well for an indefinite period of time without concern.

IV. HydraSleeve Recovery and Sample Collection

1. Hold on to the tether while removing the well cap.

2. Secure the tether at the top of the well while maintaining tension on the tether (but without pulling the tether upwards)

3. Measure the water level in the well.

4. In one smooth motion, pull the tether up between 30” to 45” (36” to 54” for the longer HydraSleeve) at a rate of about 1’ per second (or faster).

   The motion will open the top check valve and allow the HydraSleeve to fill (it should fill in about 1 to 1.5 times the length of the HydraSleeve). This is analogous to coring the water column in the well from the bottom up.

   When the HydraSleeve is full, the top check valve will close. You should begin to feel the weight of the HydraSleeve on the tether and it will begin to displace water. The closed check valve prevents loss of sample and entry of water from zones above the well screen as the HydraSleeve is recovered.

5. Continue pulling the tether upward until the HydraSleeve is at the top of the well.

6. Decant and discard the small volume of water trapped in the Hydrasleeve above the check valve by turning the sleeve over.

V. Sample Collection

Note: Sample collection should be done immediately after the HydraSleeve has been brought to the surface to preserve sample integrity.

1. Remove the discharge tube from its sleeve.

2. Hold the HydraSleeve at the check valve.

3. Puncture the HydraSleeve just below the check valve with the pointed end of the discharge tube

4. Discharge water from the HydraSleeve into your sample containers.

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Control the discharge from the HydraSleeve by either raising the bottom of the sleeve, by squeezing it like a tube of toothpaste, or both.

5. Continue filling sample containers until all are full.

Measurement of Field Indicator Parameters

Field indicator parameter measurement is generally done during well purging and sampling to confirm when parameters are stable and sampling can begin. Because no-purge sampling does not require purging, field indicator parameter measurement is not necessary for the purpose of confirming when purging is complete.

If field indicator parameter measurement is required to meet a specific non-purging regulatory requirement, it can be done by taking measurements from water within a HydraSleeve that is not used for collecting a sample to submit for laboratory analysis (i.e., a second HydraSleeve installed in conjunction with the primary sample collection HydraSleeve [see Multiple Sampler Deployment below]).

Alternate Deployment Strategies

Deployment in Wells with Limited Water Columns

For wells in which only a limited water column exists to be sampled, the HydraSleeve can be deployed with an optional top weight instead of a bottom weight, which collapses the HydraSleeve to a very short (approximately 6” to 9”) length, and allows the HydraSleeve to fill in a water column only 36” to 45” in height.

Multiple Sampler Deployment

Multiple sampler deployment in a single well screen can accomplish two purposes:

- It can collect additional sample volume to satisfy site or laboratory-specific sample volume requirements.
- It can accommodate the need for collecting field indicator parameter measurements.
- It can be used to collect samples from multiple intervals in the screen to allow identification of possible contaminant stratification.

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It is possible to use up to 3 standard 30" HydraSleeves deployed in series along a single tether to collect samples from a 10' long well screen without collecting water from the interval above the screen.

The samplers must be attached to the tether at both the top and bottom of the sleeve. Attach the tether at the top with a stainless-steel clip (available from the manufacturer). Attach the tether at the bottom using a cable tie. The samplers must be attached as follows (figure 4):

- The first (attached to the tether as described above, with the weight at the bottom) at the bottom of the screen
- The second attached immediately above the first
- The third (attached the same as the second) immediately above the second

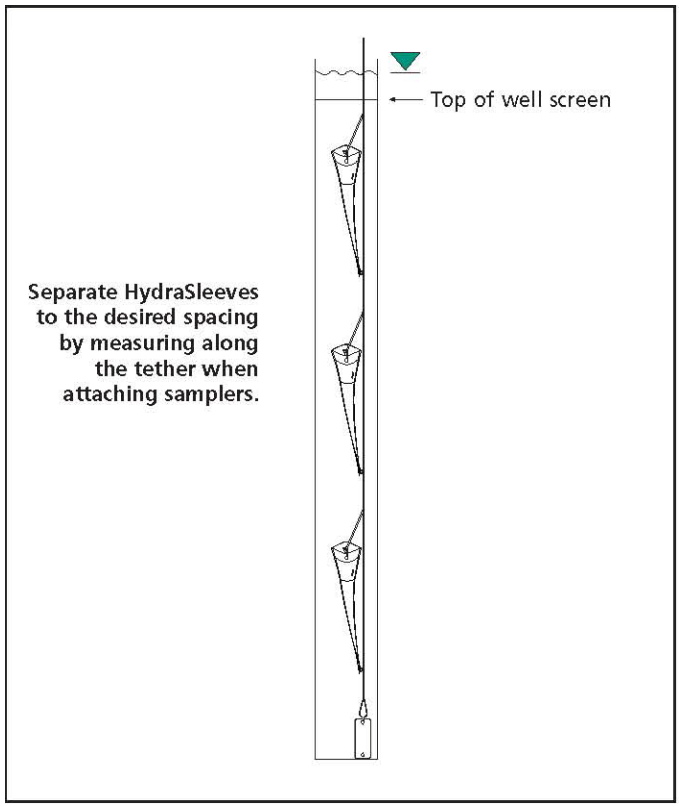

Figure 4. Multiple HydraSleeve deployment.

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Alternately, the first sampler can be attached to the tether as described above, a second attached to the bottom of the first using a short length of tether (in place of the weight), and the third attached to the bottom of the second in the same manner, with the weight attached to the bottom of the third sampler (figure 5).

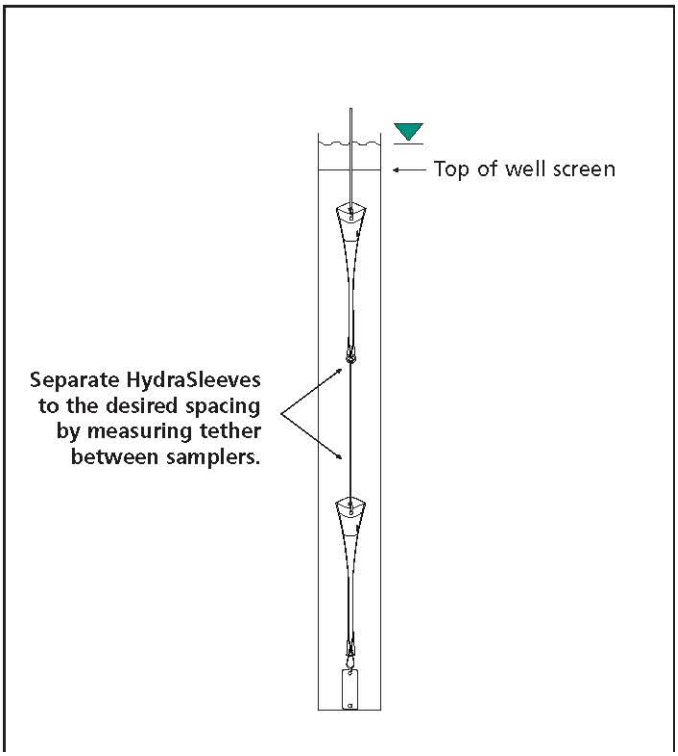

Figure 5. Alternative method for deploying multiple HydraSleeves.

In either case, when attaching multiple HydraSleeves in series, more weight may be required to hold the samplers in place in the well than would be required with a single sampler. Recovery of multiple samplers and collection of samples is done in the same manner as for single sampler deployments.

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Post-Sampling Activities

The recovered HydraSleeve and the sample discharge tubing should be disposed as per the solid waste management plan for the site. To prepare for the next sampling event, a new HydraSleeve can be deployed in the well (as described previously) and left in the well until the next sampling event, at which time it can be recovered.

The weight and weight clip can be reused on this sampler after they have been thoroughly cleaned as per the site equipment decontamination plan. The tether may be dedicated to the well and reused or discarded at the discretion of sampling personnel.

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References

McAlary, T. A. and J. F. Barker, 1987, Volatilization Losses of Organics During Ground-Water Sampling From Low-Permeability Materials, Ground-Water Monitoring Review, Vol. 7, No. 4, pp. 63-68

Parsons, 2005, Results Report for the Demonstration of No-Purge Ground-Water Sampling Devices at Former McClellan Air Force Base, California; Contract F44650-99-D-0005, Delivery Order DKO1, U.S. Army Corps of Engineers (Omaha District), U.S. Air Force Center for Environmental Excellence, and U.S. Air Force Real Property Agency

Robin, M. J. L. and R. W. Gillham, 1987, Field Evaluation of Well Purging Procedures, Ground-Water Monitoring Review, Vol. 7, No. 4, pp. 85-93

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Appendix B

Field Data Sheets

BROADBENT

GROUNDWATER MONITORING SITE SHEET

Project: Arcadis 11109 Project No.: 09-88-696 Date: 11/7/12

Field Representative: JR Elevation: _____

Formation recharge rate is historically: High Low *(circle one)*

W. L. Indicator ID #: _____ Oil/Water Interface ID #: _____ *(List #s of all equip used.)*

WELL ID RECORD					WELL GAUGING RECORD					LAB ANALYSES					
Well ID	Well Sampling Order	As-Built Well Diameter (inches)	As-Built Well Screen Interval (ft)	Previous Depth to Water (ft)	Time (24:00)	Depth to LNAPL (ft)	Apparent LNAPL Thickness (ft)*	Depth to Water (ft)	Well Total Depth (ft)						
MW-5					0940	10.13	0.17	10.30	32.07						
MW-10					0942	—	—	9.87	29.90						
MW-12					0947	10.04	0.52	10.56	30.18						
— Post-gauge —															
MW-5					1022	11.53	0.01	11.54	32.07	purged 2.5g H_2O/product					
MW-10					1030	-	-	9.87	29.96	sheen					
MW-12					1107	11.43	0.03	11.46	30.18	purged 3.5g H_2O/product					
— Demob-gauge —															
MW-5					1120	10.07	0.02	10.09	32.07						
MW-10					1121	—	—	9.87	29.90						
MW-12					1124	10.66	0.04	10.70	30.18						

* Device used to measure LNAPL thickness: Bailer Oil/Water Interface Meter *(circle one)*

If bailer used, note bailer dimensions (inches): Entry Diameter _____ Chamber Diameter _____

Signature: _____

BROADBENT

DAILY REPORT

Page 1 of 1

Project: Arcadis 11109 Project No.: 09-88-646

Field Representative(s): Alex Martinez Day: Wednesday Date: 12/5/12

Time Onsite: From: 0740 To: 0945 ; From: _____ To: _____ ; From: _____ To: _____

x Signed HASP x Safety Glasses x Hard Hat x Steel Toe Boots x Safety Vest

x UST Emergency System Shut-off Switches Located x Proper Gloves

x Proper Level of Barricading ___ Other PPE (describe) _____

Weather: Rainy

Equipment In Use: Interface probe, bailers

Visitors: None

TIME:	WORK DESCRIPTION:
0740	Arrived onsite and set up for product bailing.
0945	Completed product bailing/offsite

Signature: Alex Martinez

Revision: 1/24/2012

BROADBENT

GROUNDWATER MONITORING SITE SHEET

Project: Arcadis 11109 Project No.: 09-88-646 Date: 12/5/12

Field Representative: AM Elevation: –

Formation recharge rate is historically: High Low *(circle one)*

W. L. Indicator ID #: – Oil/Water Interface ID #: – *(List #s of all equip used.)*

WELL ID RECORD					WELL GAUGING RECORD					LAB ANALYSES					
Well ID	Well Sampling Order	As-Built Well Diameter (inches)	As-Built Well Screen Interval (ft)	Previous Depth to Water (ft)	Time (24:00)	Depth to LNAPL (ft)	Apparent LNAPL Thickness (ft)*	Depth to Water (ft)	Well Total Depth (ft)						
MW-5					0832	7.18	0.02	7.20	32.07						
MW-10					0819	–	–	6.95	29.90						
MW-12					0825	7.92	0.08	8.00	30.18						
	Post Gauge				(Purge)										
MW-5					0852	7.95	0.02	7.97	32.07	Purged	1 gallon of product/H_2O				
MW-10					0911	–	–	7.23	29.90						
MW-12					0909	8.55	0.04	8.59	30.18	Purged	1 gallon of product/H_2O				
	Demob Gauge														
MW-5					0924	7.34	0.01	7.35	32.07						
MW-10					0923	–	–	7.27	29.90						
MW-12					0924	8.14	0.04	8.18	30.18						
	Wells uncapped prior to garging														

* Device used to measure LNAPL thickness: Bailer (Oil/Water Interface Meter) *(circle one)*

If bailer used, note bailer dimensions (inches): Entry Diameter _____ Chamber Diameter _____

Signature: Alex Machin

Revision: 1/24/2012

BROADBENT

DAILY REPORT

Project: Arcadis 11109 Project No.: 09-88-646

Field Representative(s): Alex Martinez Day: Wednesday Date: 1/9/13

Time Onsite: From: 0730 To: 0915 ; From: _____ To: _____ ; From: _____ To: _____

x Signed HASP x Safety Glasses x Hard Hat x Steel Toe Boots x Safety Vest

x UST Emergency System Shut-off Switches Located x Proper Gloves

x Proper Level of Barricading ___ Other PPE (describe) _____

Weather: Partly Cloudy & cool

Equipment In Use: Interface probe, bailers

Visitors: None

TIME:	WORK DESCRIPTION:
0730	Arrived onsite. Set up around wells for product bailing.
0820	Purged 1/2 gallon of water/product from well MW-5.
0835	Purged ~1.5 gallons of water/product from well MW-12
0915	Completed fieldwork, cleaned up & offsite

Signature: Alex Martinez

BROADBENT

GROUNDWATER MONITORING SITE SHEET

Project: Arcadis 11109 Project No.: 09-88-646 Date: 1/9/13

Field Representative: AM Elevation: —

Formation recharge rate is historically: High Low *(circle one)*

W. L. Indicator ID #: _____ Oil/Water Interface ID #: _____ *(List #s of all equip used.)*

WELL ID RECORD					WELL GAUGING RECORD					LAB ANALYSES					
Well ID	Well Sampling Order	As-Built Well Diameter (inches)	As-Built Well Screen Interval (ft)	Previous Depth to Water (ft)	Time (24:00)	Depth to LNAPL (ft)	Apparent LNAPL Thickness (ft)*	Depth to Water (ft)	Well Total Depth (ft)						
MW-5					0807	8.03	0.01	~~8.04~~	32.07						
MW-10					0805	—	—	7.71	29.90						
MW-12					0802	8.46	0.06	8.52	30.18						
	Post Gauge (Purge)														
MW-5					0822	8.76	0.01	8.77	32.07						
MW-10					0823	—	—	7.76	29.90						
MW-12					0835	9.55	0.03	9.58	30.18						
	Demob Gauge														
MW-5					0854	8.09	0.01	8.10	32.07						
MW-10					0851	-	-	7.80	29.90						
MW-12					0849	8.89	0.03	8.92	30.18						
	Wells uncapped for 15 mins. prior to gauging														

* Device used to measure LNAPL thickness: Bailer (Oil/Water Interface Meter) *(circle one)*

If bailer used, note bailer dimensions (inches): Entry Diameter _____ Chamber Diameter _____

Signature: Alex Hamilton

BROADBENT

DAILY REPORT

Page 1 of 1

Project: Arcadis 11109 Project No.: 09-88-646

Field Representative(s): Alex Martinez Day: Wednesday Date: 3/20/13

Time Onsite: From: 0700 To: 1245 ; From: _____ To: _____ ; From: _____ To: _____

x Signed HASP x Safety Glasses x Hard Hat x Steel Toe Boots x Safety Vest

x UST Emergency System Shut-off Switches Located x Proper Gloves

x Proper Level of Barricading ___ Other PPE (describe) _____

Weather: Partly Cloudy / Rainy

Equipment In Use: Water level meter, interface probe, hydrasleeves

Visitors: None

TIME:	WORK DESCRIPTION:
0700	Arrived onsite.
0730	Well MW-8 was partially paved over with asphalt, but was able to break up pieces around the rim and successfully removed the lid to gauge well.
0740	Set up to gauge wells and place hydrasleeves.
0925	Set up for sampling @ MW-6
0945	Set up for sampling @ MW-3
1000	Set up for sampling @ MW-7
1015	Set up for sampling @ MW-4
1035	Set up for sampling @ MW-11
1050	Set up for product bailing @ wells MW-5, 10 & 12
1245	Completed sampling/ product bailing & offsite.
	Filled a new drum with approximately 1 gallon of water and product. Previous drum used was not on site. Stored the drum behind dumpster on North end of site.

Signature: Alex Martinez

BROADBENT

GROUNDWATER MONITORING SITE SHEET

Project: Arcadis 11109 Project No.: 09-88-646 Date: 3/20/13

Field Representative: AM Elevation: —

Formation recharge rate is historically: High Low *(circle one)*

W. L. Indicator ID #: — Oil/Water Interface ID #: — *(List #s of all equip used.)*

WELL ID RECORD					WELL GAUGING RECORD					NOTES
Well ID	Well Sampling Order	As-Built Well Diameter (inches)	As-Built Well Screen Interval (ft)	Previous Depth to Water (ft)	Time (24:00)	Depth to LNAPL (ft)	Apparent LNAPL Thickness (ft)*	Depth to Water (ft)	Well Total Depth (ft)	
MW-5					1110	9.71	0.02	9.73	32.07	Purged approx. two L of water
MW-10					1107	9.47	0.01	9.48	29.90	" " One L of water (purged
MW-12					1115	10.09	0.04	10.13	30.18	" " two L of water (purge
		Post Gauge (Purge)								
MW-5					1159	10.00	0.01	10.01		
MW-10					1156	—	—	9.69		
MW-12					1153	10.71	0.02	10.73		
		Demob Gauge								
MW-5					1205	9.91	0.01	9.92		
MW-10					1207	—	—	9.68		
MW-12					1209	10.36	0.02	10.38		
		Wells uncapped for 15 minutes prior to gauging								

* Device used to measure LNAPL thickness: Bailer Oil/Water Interface Meter *(circle one)*

If bailer used, note bailer dimensions (inches): Entry Diameter _____ Chamber Diameter _____

Signature: Alex Mackie

Revision: 8/19/11

BROADBENT

GROUNDWATER MONITORING SITE SHEET

Project: Arcadis 11109 Project No.: 09-88-646 Date: 3/20/13

Field Representative: AM Elevation: —

Formation recharge rate is historically: High Low *(circle one)*

W. L. Indicator ID #: — Oil/Water Interface ID #: — *(List #s of all equip used.)*

WELL ID RECORD					WELL GAUGING RECORD					NOTES
Well ID	Well Sampling Order	As-Built Well Diameter (inches)	As-Built Well Screen Interval (ft)	Previous Depth to Water (ft)	Time (24:00)	Depth to LNAPL (ft)	Apparent LNAPL Thickness (ft)*	Depth to Water (ft)	Well Total Depth (ft)	
MW-2				Dry	—	—	—	NM	12.81	Not measured. Broken down car parked over well.
MW-3				11.42	0819	-	-	10.30	31.42	
MW-4				15.90	0855	-	-	13.80	26.74	
MW-5				10.40	1110	9.71	0.02	9.73	32.07	
MW-6				15.80	0756	-	-	14.36	34.49	
MW-7				11.60	0832	-	-	10.88	35.32	
MW-8				—	0736	-	-	11.90	29.95	
MW-9				11.18	0747	-	-	10.00	29.47	
MW-10				10.25	1107	9.47	0.01	9.48	29.90	
MW-11				10.60	0911	-	-	9.54	30.00	
MW-12				11.63	1115	10.09	0.04	10.13	30.18	

* Device used to measure LNAPL thickness: Bailer Oil/Water Interface Meter *(circle one)*

If bailer used, note bailer dimensions (inches): Entry Diameter _____ Chamber Diameter _____

Signature: Alex Martin

Revision: 8/19/11

BROADBENT

GROUNDWATER SAMPLING DATA SHEET

Project: Arcadis 11109 Project No.: 09-88-646 Date: 3/20/13

Field Representative: AM

Well ID: MW-3 Start Time: — End Time: — Total Time (minutes): —

PURGE EQUIPMENT ___ Disp. Bailer ___ 120V Pump X Flow Cell X Disp. Tubing ___ 12V Pump X Peristaltic Pump Other/ID#:

WELL HEAD INTEGRITY (cap, lock, vault, etc.) Comments:

(Good) Improvement Needed *(circle one)*

PURGING/SAMPLING METHOD Predetermined Well Volume Low-Flow Other: Hydrasleeve *(circle one)*

PREDETERMINED WELL VOLUME

Casing Diameter | Unit Volume (gal/ft) *(circle one)*

1" | (0.04) 1.25" | (0.08) 2" | (0.17) 3" | (0.38) Other:

4" | (0.66) 6" | (1.50) 8" | (2.60) 12" | (5.81) ____" | (____)

Total Well Depth (a): _____(ft)

Initial Depth to Water (b): _____(ft)

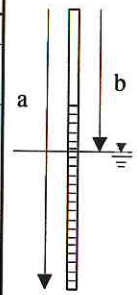
Water Column Height (WCH) = (a - b): _____(ft)

Water Column Volume (WCV) = WCH x Unit Volume: _____(gal)

Three Casing Volumes = WCV x 3: _____(gal)

Five Casing Volumes = WCV x 5: _____(gal)

Pump Depth (if pump used): _____(ft)



LOW-FLOW

Previous Low-Flow Purge Rate: _____(lpm)

Total Well Depth (a): 31.42 (ft)

Initial Depth to Water (b): _____(ft)

Pump In-take Depth = b + (a-b)/2: _____(ft)

Maximum Allowable Drawdown = (a-b)/8: _____(ft)

Low-Flow Purge Rate: _____(Lpm)*

Comments:

**Low-flow purge rate should be within range of instruments used but should not exceed 0.25 gpm. Drawdown should not exceed Maximum Allowable Drawdown.*

GROUNDWATER STABILIZATION PARAMETER RECORD

Time (24:00)	Cumulative Vol. gal or L	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
Previous Stabilized Parameters								

PURGE COMPLETION RECORD X Low Flow & Parameters Stable ___ 3 Casing Volumes & Parameters Stable ___ 5 Casing Volumes

___ Other: Hydrasleeve

SAMPLE COLLECTION RECORD

Depth to Water at Sampling: _____(ft)

Sample Collected Via: ___ Disp. Bailer ___ Dedicated Pump Tubing

X Disp. Pump Tubing Other:

Sample ID: MW-3 Sample Collection Time: 0955 (24:00)

Containers (#): 3 VOA (X preserved or ___ unpreserved) ___ Liter Amber

___ Other: ___ Other:

___ Other: ___ Other:

GEOCHEMICAL PARAMETERS

Parameter	Time	Measurement
DO (mg/L)		
Ferrous Iron (mg/L)		
Redox Potential (mV)		
Alkalinity (mg/L)		
Other:		
Other:		

Signature: Amy Martin

BROADBENT

GROUNDWATER SAMPLING DATA SHEET

Project: Arcadis 11109 Project No.: 09-88-646 Date: 3/20/13

Field Representative: AM

Well ID: MW-4 Start Time: - End Time: - Total Time (minutes): -

PURGE EQUIPMENT ___ Disp. Bailer ___ 120V Pump X Flow Cell
X Disp. Tubing ___ 12V Pump X Peristaltic Pump Other/ID#:

WELL HEAD INTEGRITY (cap, lock, vault, etc.) Comments:
(Good) Improvement Needed *(circle one)*

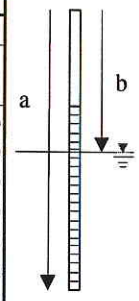
PURGING/SAMPLING METHOD Predetermined Well Volume (Low-Flow) Other: Hydrasleeve *(circle one)*

PREDETERMINED WELL VOLUME

Casing Diameter | Unit Volume (gal/ft) *(circle one)*

1" | (0.04) 1.25" | (0.08) 2" | (0.17) 3" | (0.38) Other:
4" | (0.66) 6" | (1.50) 8" | (2.60) 12" | (5.81) ___" | (___)

Total Well Depth (a): _____(ft)
Initial Depth to Water (b): _____(ft)
Water Column Height (WCH) = (a - b): _____(ft)
Water Column Volume (WCV) = WCH x Unit Volume: _____(gal)
Three Casing Volumes = WCV x 3: _____(gal)
Five Casing Volumes = WCV x 5: _____(gal)
Pump Depth (if pump used): _____(ft)



LOW-FLOW

Previous Low-Flow Purge Rate: _____(lpm)
Total Well Depth (a): _____(ft)
Initial Depth to Water (b): _____(ft)
Pump In-take Depth = b + (a-b)/2: _____(ft)
Maximum Allowable Drawdown = (a-b)/8: _____(ft)
Low-Flow Purge Rate: _____(Lpm)*
Comments:

**Low-flow purge rate should be within range of instruments used but should not exceed 0.25 gpm. Drawdown should not exceed Maximum Allowable Drawdown.*

GROUNDWATER STABILIZATION PARAMETER RECORD

Time (24:00)	Cumulative Vol. gal or L	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
Previous Stabilized Parameters								

PURGE COMPLETION RECORD X Low Flow & Parameters Stable ___ 3 Casing Volumes & Parameters Stable ___ 5 Casing Volumes
X Other: Hydrasleeve

SAMPLE COLLECTION RECORD

Depth to Water at Sampling: _____(ft)
Sample Collected Via: ___ Disp. Bailer ___ Dedicated Pump Tubing
X Disp. Pump Tubing Other:
Sample ID: MW-4 Sample Collection Time: 1025 (24:00)
Containers (#): 3 VOA (X preserved or ___ unpreserved) ___ Liter Amber
___ Other: ___ Other:
___ Other: ___ Other:

GEOCHEMICAL PARAMETERS

Parameter	Time	Measurement
DO (mg/L)		
Ferrous Iron (mg/L)		
Redox Potential (mV)		
Alkalinity (mg/L)		
Other:		
Other:		

Signature: Alex Martin

Revision: 3/15/2013

BROADBENT

GROUNDWATER SAMPLING DATA SHEET

Project: Arcadis 11109 Project No.: 09-88-646 Date: 3/20/13

Field Representative: AM

Well ID: MW-6 Start Time: — End Time: — Total Time (minutes): —

PURGE EQUIPMENT ___ Disp. Bailer ___ 120V Pump X Flow Cell
X Disp. Tubing ___ 12V Pump X Peristaltic Pump Other/ID#:

WELL HEAD INTEGRITY (cap, lock, vault, etc.) Comments:
(Good) Improvement Needed *(circle one)*

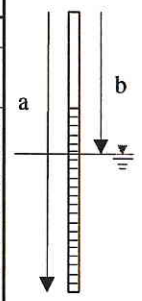
PURGING/SAMPLING METHOD Predetermined Well Volume (Low-Flow) Other: Hydrasleeve *(circle one)*

PREDETERMINED WELL VOLUME

Casing Diameter | Unit Volume (gal/ft) *(circle one)*

1" | (0.04)	1.25" | (0.08)	2" | (0.17)	3" | (0.38)	Other:
4" | (0.66)	6" | (1.50)	8" | (2.60)	12" | (5.81)	____" | (____)

Total Well Depth (a): _____(ft)
Initial Depth to Water (b): _____(ft)
Water Column Height (WCH) = (a - b): _____(ft)
Water Column Volume (WCV) = WCH x Unit Volume: _____(gal)
Three Casing Volumes = WCV x 3: _____(gal)
Five Casing Volumes = WCV x 5: _____(gal)
Pump Depth (if pump used): _____(ft)



LOW-FLOW

Previous Low-Flow Purge Rate: _____(lpm)
Total Well Depth (a): _____(ft)
Initial Depth to Water (b): _____(ft)
Pump In-take Depth = b + (a-b)/2: _____(ft)
Maximum Allowable Drawdown = (a-b)/8: _____(ft)
Low-Flow Purge Rate: _____(Lpm)*
Comments:

**Low-flow purge rate should be within range of instruments used but should not exceed 0.25 gpm. Drawdown should not exceed Maximum Allowable Drawdown.*

GROUNDWATER STABILIZATION PARAMETER RECORD

Time (24:00)	Cumulative Vol. gal or L	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
Previous Stabilized Parameters								

PURGE COMPLETION RECORD ___ Low Flow & Parameters Stable ___ 3 Casing Volumes & Parameters Stable ___ 5 Casing Volumes
___ Other: Hydrasleeve

SAMPLE COLLECTION RECORD

Depth to Water at Sampling: — (ft)
Sample Collected Via: ___ Disp. Bailer ___ Dedicated Pump Tubing
___ Disp. Pump Tubing Other:
Sample ID: MW-6 Sample Collection Time: 0935 (24:00)
Containers (#): 3 VOA (X preserved or ___ unpreserved) ___ Liter Amber
___ Other: ___ Other:
___ Other: ___ Other:

GEOCHEMICAL PARAMETERS

Parameter	Time	Measurement
DO (mg/L)		
Ferrous Iron (mg/L)		
Redox Potential (mV)		
Alkalinity (mg/L)		
Other:		
Other:		

Signature: Alex Martin

BROADBENT

GROUNDWATER SAMPLING DATA SHEET

Project: Arcadis 111109 Project No.: 09-88-646 Date: 3/20/13

Field Representative: AM

Well ID: MW-7 Start Time: - End Time: - Total Time (minutes): -

PURGE EQUIPMENT ___ Disp. Bailer ___ 120V Pump ___ Flow Cell
___ Disp. Tubing ___ 12V Pump ___ Peristaltic Pump Other/ID#: Hydrasleeve

WELL HEAD INTEGRITY (cap, lock, vault, etc.) Comments:
(Good) Improvement Needed *(circle one)*

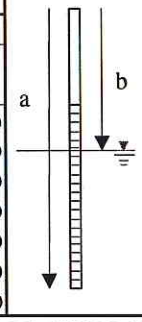
PURGING/SAMPLING METHOD Predetermined Well Volume Low-Flow Other: *(circle one)*

PREDETERMINED WELL VOLUME

Casing Diameter | Unit Volume (gal/ft) *(circle one)*

1" | (0.04) 1.25" | (0.08) 2" | (0.17) 3" | (0.38) Other:
4" | (0.66) 6" | (1.50) 8" | (2.60) 12" | (5.81) ____" | (____)

Total Well Depth (a): _____(ft)
Initial Depth to Water (b): _____(ft)
Water Column Height (WCH) = (a - b): _____(ft)
Water Column Volume (WCV) = WCH x Unit Volume: _____(gal)
Three Casing Volumes = WCV x 3: _____(gal)
Five Casing Volumes = WCV x 5: _____(gal)
Pump Depth (if pump used): _____(ft)



LOW-FLOW

Previous Low-Flow Purge Rate: _____(lpm)
Total Well Depth (a): _____(ft)
Initial Depth to Water (b): _____(ft)
Pump In-take Depth = b + (a-b)/2: _____(ft)
Maximum Allowable Drawdown = (a-b)/8: _____(ft)
Low-Flow Purge Rate: _____(Lpm)*
Comments:

**Low-flow purge rate should be within range of instruments used but should not exceed 0.25 gpm. Drawdown should not exceed Maximum Allowable Drawdown.*

GROUNDWATER STABILIZATION PARAMETER RECORD

Time (24:00)	Cumulative Vol. gal or L	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
Previous Stabilized Parameters								

PURGE COMPLETION RECORD ___ Low Flow & Parameters Stable ___ 3 Casing Volumes & Parameters Stable ___ 5 Casing Volumes
___ Other: Hydrasleeve

SAMPLE COLLECTION RECORD

Depth to Water at Sampling: - (ft)
Sample Collected Via: ___ Disp. Bailer ___ Dedicated Pump Tubing
___ Disp. Pump Tubing Other: Hydrasleeve
Sample ID: MW-7 Sample Collection Time: 1010 (24:00)
Containers (#): 3 VOA (X preserved or ___ unpreserved) ___ Liter Amber
___ Other: ___ Other:
___ Other: ___ Other:

GEOCHEMICAL PARAMETERS

Parameter	Time	Measurement
DO (mg/L)		
Ferrous Iron (mg/L)		
Redox Potential (mV)		
Alkalinity (mg/L)		
Other:		
Other:		

Signature: Alex Martin

BROADBENT

GROUNDWATER SAMPLING DATA SHEET

Project: Arcadis 11109 Project No.: 09-88-646 Date: 3/20/13

Field Representative: AM

Well ID: MW-11 Start Time: _____ End Time: _____ Total Time (minutes): _____

PURGE EQUIPMENT ___ Disp. Bailer ___ 120V Pump ___ Flow Cell ___ Disp. Tubing ___ 12V Pump ___ Peristaltic Pump Other/ID#: Hydrasleeve

WELL HEAD INTEGRITY (cap, lock, vault, etc.) Comments: _____

Good Improvement Needed *(circle one)*

PURGING/SAMPLING METHOD Predetermined Well Volume Low-Flow Other: *(circle one)*

PREDETERMINED WELL VOLUME

Casing Diameter | Unit Volume (gal/ft) *(circle one)*

1" | (0.04) 1.25" | (0.08) 2" | (0.17) 3" | (0.38) Other:

4" | (0.66) 6" | (1.50) 8" | (2.60) 12" | (5.81) ____" | (____)

Total Well Depth (a): _____(ft)

Initial Depth to Water (b): _____(ft)

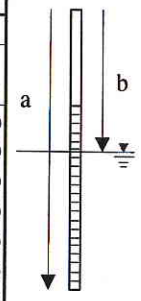
Water Column Height (WCH) = (a - b): _____(ft)

Water Column Volume (WCV) = WCH x Unit Volume: _____(gal)

Three Casing Volumes = WCV x 3: _____(gal)

Five Casing Volumes = WCV x 5: _____(gal)

Pump Depth (if pump used): _____(ft)



LOW-FLOW

Previous Low-Flow Purge Rate: _____(lpm)

Total Well Depth (a): _____(ft)

Initial Depth to Water (b): _____(ft)

Pump In-take Depth = b + (a-b)/2: _____(ft)

Maximum Allowable Drawdown = (a-b)/8: _____(ft)

Low-Flow Purge Rate: _____(Lpm)*

Comments: _____

**Low-flow purge rate should be within range of instruments used but should not exceed 0.25 gpm. Drawdown should not exceed Maximum Allowable Drawdown.*

GROUNDWATER STABILIZATION PARAMETER RECORD

Time (24:00)	Cumulative Vol. gal or L	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
								Moderate hydro-carbon odor.
Previous Stabilized Parameters								

PURGE COMPLETION RECORD ___ Low Flow & Parameters Stable ___ 3 Casing Volumes & Parameters Stable ___ 5 Casing Volumes

___ Other: Hydrasleeve

SAMPLE COLLECTION RECORD

Depth to Water at Sampling: — (ft)

Sample Collected Via: ___ Disp. Bailer ___ Dedicated Pump Tubing

___ Disp. Pump Tubing Other:

Sample ID: MW-11 Sample Collection Time: 1045 (24:00)

Containers (#): 3 VOA (X preserved or ___ unpreserved) ___ Liter Amber

___ Other: _____ ___ Other: _____

___ Other: _____ ___ Other: _____

GEOCHEMICAL PARAMETERS

Parameter	Time	Measurement
DO (mg/L)		
Ferrous Iron (mg/L)		
Redox Potential (mV)		
Alkalinity (mg/L)		
Other:		
Other:		

Signature: _____

San Francisco
~~West Sacramento~~
880 Riverside Parkway
West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Kristene Tidwell	Site Contact: Alex Martinez	Date:	COC No:
Broadbent & Associates, Inc.	Tel/Fax: 707-455-7290 / 707-445-7295	Lab Contact: Dimple Sharma	Carrier:	____ of ____ COCs
875 Cotting Lane, Suite G	Analysis Turnaround Time			Job No.
Vacaville, CA 95688	Calendar (C) or Work Days (W) ____			
Phone: 707-455-7290	TAT if different from Below ____			SDG No.
Fax: 707-455-7295	☐ 2 weeks			
Project Name: Arcadis 11109	☐ 1 week			
4280 Foothill Blvd., Oakland, CA	☐ 2 days			
P O # GP09BPNA.C106	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	GRO by 8260	BTEX/5 FO + EDB, 1,2-DCA by 8260	Ethanol by 8260	MTBE by 8260B	Sample Specific Notes:
MW-3	3/20/2013	0955	GRAB	AQ	3					X	
MW-4	3/20/2013	1025	GRAB	AQ	3		X			X	
MW-6	3/20/2013	0935	GRAB	AQ	3		X	X	X		
MW-7	3/20/2013	1010	GRAB	AQ	3					X	
~~MW-10~~	~~3/20/2013~~	—	~~GRAB~~	~~AQ~~	~~3~~		~~X~~	~~X~~	~~X~~		
MW-11	3/20/2013	1045	GRAB	AQ	3		X	X	X		
TB-11109-03202013	--	--	--	AQ	1						On Hold

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other ____

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* ☐

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*

Special Instructions/QC Requirements & Comments: All samples collected via Hydrasleeves

0.4°C

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Alex Martinez	Broadbent	3/20/13 1325		~~TA~~ Amri	3-20-13 1325
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

ARCADIS

Appendix C

Laboratory Report and Chain-of-Custody Documentation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

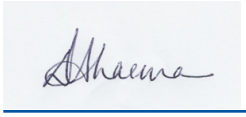
ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-48437-1
Client Project/Site: BP #11109, Oakland

For:
ARCADIS U.S., Inc.
100 Montgomery Street
Suite 300
San Francisco, California 94104

Attn: Hollis Phillips



Authorized for release by:
3/26/2013 2:25:50 PM

Dimple Sharma
Project Manager I
dimple.sharma@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-48437-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-48437-1

Comments
No additional comments.

Receipt
The samples were received on 3/20/2013 1:25 PM; the samples arrived in good condition, properly preserved and, where required, on ice.
The temperature of the cooler at receipt was 0.4° C.

GC/MS VOA
No analytical or quality issues were noted.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #11109, Oakland

TestAmerica Job ID: 720-48437-1

Client Sample ID: MW-3 — Lab Sample ID: 720-48437-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methyl tert-butyl ether	2.6		0.50		ug/L	1		8260B/CA_LUFT MS	Total/NA

Client Sample ID: MW-4 — Lab Sample ID: 720-48437-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methyl tert-butyl ether	17		0.50		ug/L	1		8260B/CA_LUFT MS	Total/NA

Client Sample ID: MW-6 — Lab Sample ID: 720-48437-3

No Detections.

Client Sample ID: MW-7 — Lab Sample ID: 720-48437-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Methyl tert-butyl ether	3.4		0.50		ug/L	1		8260B/CA_LUFT MS	Total/NA

Client Sample ID: MW-11 — Lab Sample ID: 720-48437-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	250		10		ug/L	20		8260B/CA_LUFT MS	Total/NA
Ethylbenzene	680		10		ug/L	20		8260B/CA_LUFT MS	Total/NA
Toluene	620		10		ug/L	20		8260B/CA_LUFT MS	Total/NA
Xylenes, Total	2200		20		ug/L	20		8260B/CA_LUFT MS	Total/NA
Gasoline Range Organics (GRO) -C6-C12	16000		1000		ug/L	20		8260B/CA_LUFT MS	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: BP #11109, Oakland

TestAmerica Job ID: 720-48437-1

Client Sample ID: MW-3
Date Collected: 03/20/13 09:55
Date Received: 03/20/13 13:25

Lab Sample ID: 720-48437-1
Matrix: Water

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	2.6		0.50		ug/L			03/21/13 14:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*96*		*67 - 130*		*03/21/13 14:09*	*1*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 138*		*03/21/13 14:09*	*1*
Toluene-d8 (Surr)	*97*		*70 - 130*		*03/21/13 14:09*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #11109, Oakland

TestAmerica Job ID: 720-48437-1

Client Sample ID: MW-4
Date Collected: 03/20/13 10:25
Date Received: 03/20/13 13:25

Lab Sample ID: 720-48437-2
Matrix: Water

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	**17**		0.50		ug/L			03/21/13 14:35	1
Gasoline Range Organics (GRO) -C6-C12	ND		50		ug/L			03/21/13 14:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*99*		*67 - 130*		*03/21/13 14:35*	*1*
1,2-Dichloroethane-d4 (Surr)	*120*		*75 - 138*		*03/21/13 14:35*	*1*
Toluene-d8 (Surr)	*97*		*70 - 130*		*03/21/13 14:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #11109, Oakland

TestAmerica Job ID: 720-48437-1

Client Sample ID: MW-6
Date Collected: 03/20/13 09:35
Date Received: 03/20/13 13:25

Lab Sample ID: 720-48437-3
Matrix: Water

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
MTBE	ND		0.50		ug/L			03/26/13 01:29	1
Benzene	ND		0.50		ug/L			03/26/13 01:29	1
EDB	ND		0.50		ug/L			03/26/13 01:29	1
1,2-DCA	ND		0.50		ug/L			03/26/13 01:29	1
Ethylbenzene	ND		0.50		ug/L			03/26/13 01:29	1
Toluene	ND		0.50		ug/L			03/26/13 01:29	1
Xylenes, Total	ND		1.0		ug/L			03/26/13 01:29	1
Gasoline Range Organics (GRO) -C6-C12	ND		50		ug/L			03/26/13 01:29	1
TBA	ND		4.0		ug/L			03/26/13 01:29	1
Ethanol	ND		250		ug/L			03/26/13 01:29	1
DIPE	ND		0.50		ug/L			03/26/13 01:29	1
TAME	ND		0.50		ug/L			03/26/13 01:29	1
Ethyl t-butyl ether	ND		0.50		ug/L			03/26/13 01:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*103*		*67 - 130*		*03/26/13 01:29*	*1*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 138*		*03/26/13 01:29*	*1*
Toluene-d8 (Surr)	*98*		*70 - 130*		*03/26/13 01:29*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #11109, Oakland

TestAmerica Job ID: 720-48437-1

Client Sample ID: MW-7
Date Collected: 03/20/13 10:10
Date Received: 03/20/13 13:25

Lab Sample ID: 720-48437-4
Matrix: Water

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	3.4		0.50		ug/L			03/21/13 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*100*		*67 - 130*		*03/21/13 15:01*	*1*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 138*		*03/21/13 15:01*	*1*
Toluene-d8 (Surr)	*101*		*70 - 130*		*03/21/13 15:01*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #11109, Oakland

TestAmerica Job ID: 720-48437-1

Client Sample ID: MW-11
Date Collected: 03/20/13 10:45
Date Received: 03/20/13 13:25

Lab Sample ID: 720-48437-5
Matrix: Water

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
MTBE	ND		10		ug/L			03/26/13 01:57	20
Benzene	**250**		10		ug/L			03/26/13 01:57	20
EDB	ND		10		ug/L			03/26/13 01:57	20
1,2-DCA	ND		10		ug/L			03/26/13 01:57	20
Ethylbenzene	**680**		10		ug/L			03/26/13 01:57	20
Toluene	**620**		10		ug/L			03/26/13 01:57	20
Xylenes, Total	**2200**		20		ug/L			03/26/13 01:57	20
Gasoline Range Organics (GRO) -C6-C12	**16000**		1000		ug/L			03/26/13 01:57	20
TBA	ND		80		ug/L			03/26/13 01:57	20
Ethanol	ND		5000		ug/L			03/26/13 01:57	20
DIPE	ND		10		ug/L			03/26/13 01:57	20
TAME	ND		10		ug/L			03/26/13 01:57	20
Ethyl t-butyl ether	ND		10		ug/L			03/26/13 01:57	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*107*		*67 - 130*		*03/26/13 01:57*	*20*
1,2-Dichloroethane-d4 (Surr)	*121*		*75 - 138*		*03/26/13 01:57*	*20*
Toluene-d8 (Surr)	*101*		*70 - 130*		*03/26/13 01:57*	*20*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Lab Sample ID: MB 720-132758/5
Matrix: Water
Analysis Batch: 132758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl tert-butyl ether	ND		0.50		ug/L			03/21/13 08:55	1
Gasoline Range Organics (GRO) -C6-C12	ND		50		ug/L			03/21/13 08:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*97*		*67 - 130*		*03/21/13 08:55*	*1*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 138*		*03/21/13 08:55*	*1*
Toluene-d8 (Surr)	*96*		*70 - 130*		*03/21/13 08:55*	*1*

Lab Sample ID: LCS 720-132758/6
Matrix: Water
Analysis Batch: 132758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methyl tert-butyl ether	25.0	30.1		ug/L		120	62 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*106*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 138*
Toluene-d8 (Surr)	*99*		*70 - 130*

Lab Sample ID: LCS 720-132758/8
Matrix: Water
Analysis Batch: 132758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline Range Organics (GRO) -C6-C12	500	470		ug/L		94	58 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*103*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 138*
Toluene-d8 (Surr)	*98*		*70 - 130*

Lab Sample ID: LCSD 720-132758/7
Matrix: Water
Analysis Batch: 132758

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methyl tert-butyl ether	25.0	32.3		ug/L		129	62 - 130	7	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*107*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*115*		*75 - 138*
Toluene-d8 (Surr)	*100*		*70 - 130*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCSD 720-132758/9
Matrix: Water
Analysis Batch: 132758

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12	500	485		ug/L		97	58 - 120	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*103*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 138*
Toluene-d8 (Surr)	*98*		*70 - 130*

Lab Sample ID: MB 720-133020/5
Matrix: Water
Analysis Batch: 133020

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
MTBE	ND		0.50		ug/L			03/25/13 19:55	1
Benzene	ND		0.50		ug/L			03/25/13 19:55	1
EDB	ND		0.50		ug/L			03/25/13 19:55	1
1,2-DCA	ND		0.50		ug/L			03/25/13 19:55	1
Ethylbenzene	ND		0.50		ug/L			03/25/13 19:55	1
Toluene	ND		0.50		ug/L			03/25/13 19:55	1
Xylenes, Total	ND		1.0		ug/L			03/25/13 19:55	1
Gasoline Range Organics (GRO) -C6-C12	ND		50		ug/L			03/25/13 19:55	1
TBA	ND		4.0		ug/L			03/25/13 19:55	1
Ethanol	ND		250		ug/L			03/25/13 19:55	1
DIPE	ND		0.50		ug/L			03/25/13 19:55	1
TAME	ND		0.50		ug/L			03/25/13 19:55	1
Ethyl t-butyl ether	ND		0.50		ug/L			03/25/13 19:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*105*		*67 - 130*		*03/25/13 19:55*	*1*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 138*		*03/25/13 19:55*	*1*
Toluene-d8 (Surr)	*99*		*70 - 130*		*03/25/13 19:55*	*1*

Lab Sample ID: LCS 720-133020/6
Matrix: Water
Analysis Batch: 133020

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
MTBE	25.0	26.1		ug/L		105	62 - 130
Benzene	25.0	21.9		ug/L		88	79 - 130
EDB	25.0	24.5		ug/L		98	70 - 130
1,2-DCA	25.0	25.1		ug/L		100	61 - 132
Ethylbenzene	25.0	22.2		ug/L		89	80 - 120
Toluene	25.0	21.7		ug/L		87	78 - 120
m-Xylene & p-Xylene	50.0	46.3		ug/L		93	70 - 142
o-Xylene	25.0	25.2		ug/L		101	70 - 130
TBA	500	473		ug/L		95	70 - 130
Ethanol	500	542		ug/L		108	31 - 216

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-133020/6
Matrix: Water
Analysis Batch: 133020

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
DIPE			25.0	23.7		ug/L		95	69 - 134		
TAME			25.0	27.7		ug/L		111	79 - 130		
Ethyl t-butyl ether			25.0	27.0		ug/L		108	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*104*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 138*
Toluene-d8 (Surr)	*101*		*70 - 130*

Lab Sample ID: LCS 720-133020/8
Matrix: Water
Analysis Batch: 133020

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			500	423		ug/L		85	58 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*107*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 138*
Toluene-d8 (Surr)	*101*		*70 - 130*

Lab Sample ID: LCSD 720-133020/7
Matrix: Water
Analysis Batch: 133020

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
MTBE			25.0	25.8		ug/L		103	62 - 130	1	20
Benzene			25.0	22.1		ug/L		88	79 - 130	1	20
EDB			25.0	24.2		ug/L		97	70 - 130	1	20
1,2-DCA			25.0	24.7		ug/L		99	61 - 132	2	20
Ethylbenzene			25.0	22.6		ug/L		90	80 - 120	2	20
Toluene			25.0	22.2		ug/L		89	78 - 120	2	20
m-Xylene & p-Xylene			50.0	47.2		ug/L		94	70 - 142	2	20
o-Xylene			25.0	25.6		ug/L		102	70 - 130	1	20
TBA			500	483		ug/L		97	70 - 130	2	20
Ethanol			500	560		ug/L		112	31 - 216	3	30
DIPE			25.0	23.4		ug/L		93	69 - 134	2	20
TAME			25.0	27.2		ug/L		109	79 - 130	2	20
Ethyl t-butyl ether			25.0	26.3		ug/L		105	70 - 130	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*103*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 138*
Toluene-d8 (Surr)	*100*		*70 - 130*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCSD 720-133020/9
Matrix: Water
Analysis Batch: 133020

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12			500	441		ug/L		88	58 - 120	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*107*		*67 - 130*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 138*
Toluene-d8 (Surr)	*100*		*70 - 130*

GC/MS VOA

Analysis Batch: 132758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-48437-1	MW-3	Total/NA	Water	8260B/CA_LUFT MS	
720-48437-2	MW-4	Total/NA	Water	8260B/CA_LUFT MS	
720-48437-4	MW-7	Total/NA	Water	8260B/CA_LUFT MS	
LCS 720-132758/6	Lab Control Sample	Total/NA	Water	8260B/CA_LUFT MS	
LCS 720-132758/8	Lab Control Sample	Total/NA	Water	8260B/CA_LUFT MS	
LCSD 720-132758/7	Lab Control Sample Dup	Total/NA	Water	8260B/CA_LUFT MS	
LCSD 720-132758/9	Lab Control Sample Dup	Total/NA	Water	8260B/CA_LUFT MS	
MB 720-132758/5	Method Blank	Total/NA	Water	8260B/CA_LUFT MS	

Analysis Batch: 133020

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-48437-3	MW-6	Total/NA	Water	8260B/CA_LUFT MS	
720-48437-5	MW-11	Total/NA	Water	8260B/CA_LUFT MS	
LCS 720-133020/6	Lab Control Sample	Total/NA	Water	8260B/CA_LUFT MS	
LCS 720-133020/8	Lab Control Sample	Total/NA	Water	8260B/CA_LUFT MS	
LCSD 720-133020/7	Lab Control Sample Dup	Total/NA	Water	8260B/CA_LUFT MS	
LCSD 720-133020/9	Lab Control Sample Dup	Total/NA	Water	8260B/CA_LUFT MS	
MB 720-133020/5	Method Blank	Total/NA	Water	8260B/CA_LUFT MS	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: BP #11109, Oakland

TestAmerica Job ID: 720-48437-1

Client Sample ID: MW-3

Lab Sample ID: 720-48437-1

Date Collected: 03/20/13 09:55

Matrix: Water

Date Received: 03/20/13 13:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	132758	03/21/13 14:09	AC	TAL SF

Client Sample ID: MW-4

Lab Sample ID: 720-48437-2

Date Collected: 03/20/13 10:25

Matrix: Water

Date Received: 03/20/13 13:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	132758	03/21/13 14:35	AC	TAL SF

Client Sample ID: MW-6

Lab Sample ID: 720-48437-3

Date Collected: 03/20/13 09:35

Matrix: Water

Date Received: 03/20/13 13:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	133020	03/26/13 01:29	AC	TAL SF

Client Sample ID: MW-7

Lab Sample ID: 720-48437-4

Date Collected: 03/20/13 10:10

Matrix: Water

Date Received: 03/20/13 13:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	132758	03/21/13 15:01	AC	TAL SF

Client Sample ID: MW-11

Lab Sample ID: 720-48437-5

Date Collected: 03/20/13 10:45

Matrix: Water

Date Received: 03/20/13 13:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		20	133020	03/26/13 01:57	AC	TAL SF

Laboratory References:

TAL SF = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #11109, Oakland

TestAmerica Job ID: 720-48437-1

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-14

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #11109, Oakland

TestAmerica Job ID: 720-48437-1

Method	Method Description	Protocol	Laboratory
8260B/CA_LUFTMS	8260B / CA LUFT MS	SW846	TAL SF

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SF = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #11109, Oakland

TestAmerica Job ID: 720-48437-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-48437-1	MW-3	Water	03/20/13 09:55	03/20/13 13:25
720-48437-2	MW-4	Water	03/20/13 10:25	03/20/13 13:25
720-48437-3	MW-6	Water	03/20/13 09:35	03/20/13 13:25
720-48437-4	MW-7	Water	03/20/13 10:10	03/20/13 13:25
720-48437-5	MW-11	Water	03/20/13 10:45	03/20/13 13:25

San Francisco
~~West Sacramento~~
880 Riverside Parkway
West Sacramento, CA 95605
phone 916.374.4378 fax 916.372.1059

Chain of Custody Record

720-48437

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
144694
TestAmerica Laboratories, Inc.

3/26/2013

Client Contact	Project Manager: Kristene Tidwell	Site Contact: Alex Martinez	Date:	COC No:
Broadbent & Associates, Inc.	Tel/Fax: 707-455-7290 / 707-445-7295	Lab Contact: Dimple Sharma	Carrier:	_____ of _____ COCs
875 Cotting Lane, Suite G	Analysis Turnaround Time			Job No.
Vacaville, CA 95688	Calendar (C) or Work Days (W) _____			
Phone: 707-455-7290	TAT if different from Below _____			
Fax: 707-455-7295	☐ 2 weeks			SDG No.
Project Name: Arcadis 11109	☐ 1 week			
4280 Foothill Blvd., Oakland, CA	☐ 2 days			
P O # GP09BPNA.C106	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	GRO by 8260	BTEX/5 FO + EDB, 1,2-DCA by 8260	Ethanol by 8260	MTBE by 8260B	Sample Specific Notes:
MW-3	3/20/2013	0955	GRAB	AQ	3					X	
MW-4	3/20/2013	1025	GRAB	AQ	3		X			X	
MW-6	3/20/2013	0935	GRAB	AQ	3		X	X	X		
MW-7	3/20/2013	1010	GRAB	AQ	3					X	
~~MW-10~~	~~3/20/2013~~	—	~~GRAB~~	~~AQ~~	~~3~~		X	X	X		
MW-11	3/20/2013	1045	GRAB	AQ	3		X	X	X		
TB-11109-03202013	--	--	--	AQ	1						On Hold

720-48437 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* *Poison B* ☐ *Unknown* ☐

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Special Instructions/QC Requirements & Comments: All samples collected via Hydrasleeves

0.4°C

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Alex Martinez	Broadbent	3/20/13 1325		~~test~~ Amri	3-20-13 1325
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 720-48437-1

Login Number: 48437

List Source: TestAmerica Pleasanton

List Number: 1

Creator: Mullen, Joan

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix D

GeoTracker Upload Confirmation Receipts

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	EDF
Report Title:	Fourth Quarter 2013 and First Quarter 2013 Semi-Annual Groundwater Monitoring Report
Report Type:	Monitoring Report - Semi-Annually
Facility Global ID:	T0600100217
Facility Name:	BP #11109
File Name:	720-48437-1.zip
Organization Name:	ARCADIS
Username:	ARCADISBP
IP Address:	216.207.98.101
Submittal Date/Time:	4/22/2013 10:29:48 AM
Confirmation Number:	7953622043

VIEW QC REPORT

VIEW DETECTIONS REPORT

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STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A GEO_WELL FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	GEO_WELL
Report Title:	BP 11109 GMR 1Q13
Facility Global ID:	T0600100217
Facility Name:	BP #11109
File Name:	GEO_WELL.zip
Organization Name:	ARCADIS
Username:	ARCADISBP
IP Address:	216.207.98.101
Submittal Date/Time:	4/1/2013 9:23:08 AM
Confirmation Number:	6981828212

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