Atlantic Richfield Company

Shannon Couch
Operations Project Manager

PO Box 1257
San Ramon, CA 94583
Phone: (925) 275-3804
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E-Mail: shannon.couch@bp.com

April 29, 2013

RECEIVED
By Alameda County Environmental Health at 10:39 am, May 01, 2013

Re: First Quarter 2013 Monitoring Report
Atlantic Richfield Company Station #2107
3310 Park Boulevard, Oakland, California
ACEH Case #RO0002526

"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.

Submitted by,

Shannon Couch
Operations Project Manager

Attachment:

BROADBENT
875 Cotting Ln., Suite G, Vacaville, CA 95688
[T] 707-455-7290 [F] 707-455-7295
broadbentinc.com

Creating Solutions, Building Trust.

April 29, 2013

Project No. 06-88-614

Atlantic Richfield Company
P.O. Box 1257
San Ramon, CA 94583
Submitted via ENFOS

Attn.: Ms. Shannon Couch

Re: First Quarter 2013 Monitoring Report, Atlantic Richfield Company Station #2107, 3310 Park Boulevard, Oakland, California; ACEH Case #RO0002526

Dear Ms. Couch:

Attached is the *First Quarter 2013 Monitoring Report* for Atlantic Richfield Company (a BP affiliated company) Station #2107 located at, 3310 Park Boulevard, Oakland, Alameda County, California. This report presents results of groundwater monitoring conducted at the Site during the Third Quarter of 2012.

Should you have questions regarding the work performed or results obtained, please do not hesitate to contact us at (707) 455-7290.

Sincerely,
BROADBENT & ASSOCIATES

Alexander J. Martinez
Senior Staff Geologist

Kristene Tidwell, P.G., C.H.G.
Senior Geologist

PROFESSIONAL GEOLOGIST
KRISTENE TIDWELL
No. 969
CERTIFIED HYDRO GEOLOGIST
STATE OF CALIFORNIA
Exp 1/31/14

Enclosures

cc: Ms. Dilan Roe, Alameda County Environmental Health (Submitted via ACEH ftp site)
Electronic copy uploaded to GeoTracker

FIRST QUARTER 2013
MONITORING REPORT
ATLANTIC RICHFIELD COMPANY STATION #2107
OAKLAND, CALIFORNIA

Broadbent and Associates, Inc. (Broadbent) is pleased to present this *First Quarter 2013 Monitoring Report* on behalf of Atlantic Richfield Company (ARC, a BP affiliated company) for Station #2107 located at 3310 Park Boulevard in Oakland, Alameda County, California (the Site). Monitoring activities at the Site were performed in accordance with an agency directive issued by the Alameda County Environmental Health (ACEH). Details of work performed, discussion of results, and recommendations are provided below.

Facility Name / Address:	Station #2107 / 3310 Park Blvd., Oakland, California; Drawing 1
Client Project Manager / Title:	Ms. Shannon Couch / Operations Project Manager
Broadbent Contact:	Ms. Kristene Tidwell, (707) 455-7290
Broadbent Project No.:	06-88-614
Primary Regulatory Agency / ID No.:	ACEH / Case # RO0002526
Current phase of project:	Monitoring
List of Acronyms / Abbreviations:	See end of report text for list of acronyms/abbreviations used in report.

WORK PERFORMED THIS QUARTER (First Quarter 2013):

1. Submitted *Fourth Quarter 2012 Status Report* on January 21, 2013.
2. Conducted groundwater monitoring/sampling for First Quarter 2013 on March 26, 2013.

WORK SCHEDULED FOR NEXT QUARTER (Second Quarter 2013):

1. Submit *First Quarter 2013 Monitoring Report* (contained herein).
2. No other environmental work is scheduled for the Second Quarter 2013.
3. Submit Addendum to the November 6, 2012 *Work Plan for Groundwater Investigation.*

QUARTERLY MONITORING PLAN SUMMARY:

Groundwater level gauging:	MW-11A, MW-11B, MW-12A, MW-12B, MW-13A, MW-13B	(Semi-Annually, 1Q &3Q)
Groundwater sample collection:	MW-11A, MW-11B, MW-12A, MW-12B, MW-13A, MW-13B	(Semi-Annually, 1Q & 3Q)
Biodegradation indicator parameter monitoring:	None	(Quarterly)

QUARTERLY RESULTS SUMMARY:

LNAPL

LNAPL observed this quarter:	No	(yes\no)
LNAPL recovered this quarter:	None	(gal)
Cumulative LNAPL recovered:	None	(gal)

Groundwater Elevation and Gradient:

Depth to groundwater:	2.74 ft (MW-13A) to 13.70 ft (MW-11A)	(ft below TOC)
Gradient direction:	North-Northwest	(compass direction)
Gradient magnitude:	0.01	(ft/ft)
Average change in elevation:	0.72	(ft since last measurement)

Laboratory Analytical Data

Summary:

Analytical Results are as follows:

- GRO was detected in one well with a concentration 260 µg/L in well MW-11A
- TAME was detected in one well with a concentration of 3.9 µg/L in well MW-11A
- Toluene was detected in one well with a concentration of 4.2 µg/L in well MW-11A
- MTBE was detected in all six wells with a maximum concentration of 330 µg/L in well MW-11A

ACTIVITIES CONDUCTED & RESULTS:

First Quarter 2013 groundwater monitoring and sampling activities were conducted on March 26, 2013 by Broadbent personnel in accordance with the First Quarter monitoring plan. No irregularities were noted during gauging. Light Non-Aqueous Phase Liquid (LNAPL) was not present in the wells monitored during this event. Depth to groundwater ranged from 2.74 ft in MW-13A to 13.70 ft in MW-11A. As shown on Drawing 2, groundwater gradient on March 26, 2013 was 0.01 ft/ft in a north-northwest direction. The elevation from well MW-11A was not used for contouring because the data appears anomalous. Current and historic groundwater elevations and groundwater sample analytical data are provided in Tables 1 and 2. Historical groundwater gradient information is provided in Table 3. Drawing 2 is presents a groundwater elevation contours and analytical summary map for September 11, 2012. Field procedures used during groundwater monitoring are provided in Appendix A. Field data sheets and the Non-Hazardous Waste Disposal Form are included in Appendix B.

Groundwater samples were collected on March 26, 2013. No irregularities were reported during sampling. Samples were submitted to Test America Laboratories, Inc. (Test America) of Irvine, California for analyses of GRO, by EPA Method 8015B; for BTEX, MTBE, ETBE, TAME, DIPE, TBA, EDB, 1,2-DCA and Ethanol by EPA Method 8260B. No irregularities were encountered during analysis of the samples. Laboratory analytical report and chain of custody record are 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.

Results of the sampling event are included in the laboratory analytical data summary above. These results indicate that the highest concentrations of petroleum hydrocarbons are present in well MW-11A. The remaining analytes detected this quarter appear to be generally consistent with previous data. Further discussion of these results is presented below.

DISCUSSION:

Review of historical groundwater gradient data indicates that levels were between historic minimum and maximum elevations for all wells while groundwater elevations yielded a potentiometric groundwater gradient to the north-northwest at 0.01 ft/ft, consistent with the historic gradient data presented in Table 3.

Review of historical groundwater results indicate that well MW-11A contains the highest residual petroleum compounds at the Site. Well MW-11A however, has indicated a slight increase in concentration of GRO and MTBE, and a decrease in benzene, toluene and ethylbenzene relative to the Third Quarter 2012. The remaining monitoring wells onsite are downgradient of well MW-11A and continue to indicate no detections of GRO and

benzene. However, each well had detections of MTBE, which decreased slightly in wells ME-11B, MW-12A, MW-12B, MW-13A and MW-13B relative to the Third Quarter 2012.

RECOMMENDATIONS:

No environmental work activities are scheduled to be conducted at the Site during the Second Quarter 2012. The next quarterly monitoring event is scheduled for the Third Quarter 2013. Due to the concentrations of MTBE in offsite wells, and the fact that the extent of MTBE offsite is not defined, a work plan for additional downgradient groundwater assessment was submitted November 6, 2012. An addendum to this Work Plan is currently being prepared. This addendum will discuss vertical groundwater gradients in offsite wells, and recommend any necessary changes to the previously-proposed scope of work based on the vertical gradient evaluation.

LIMITATIONS:

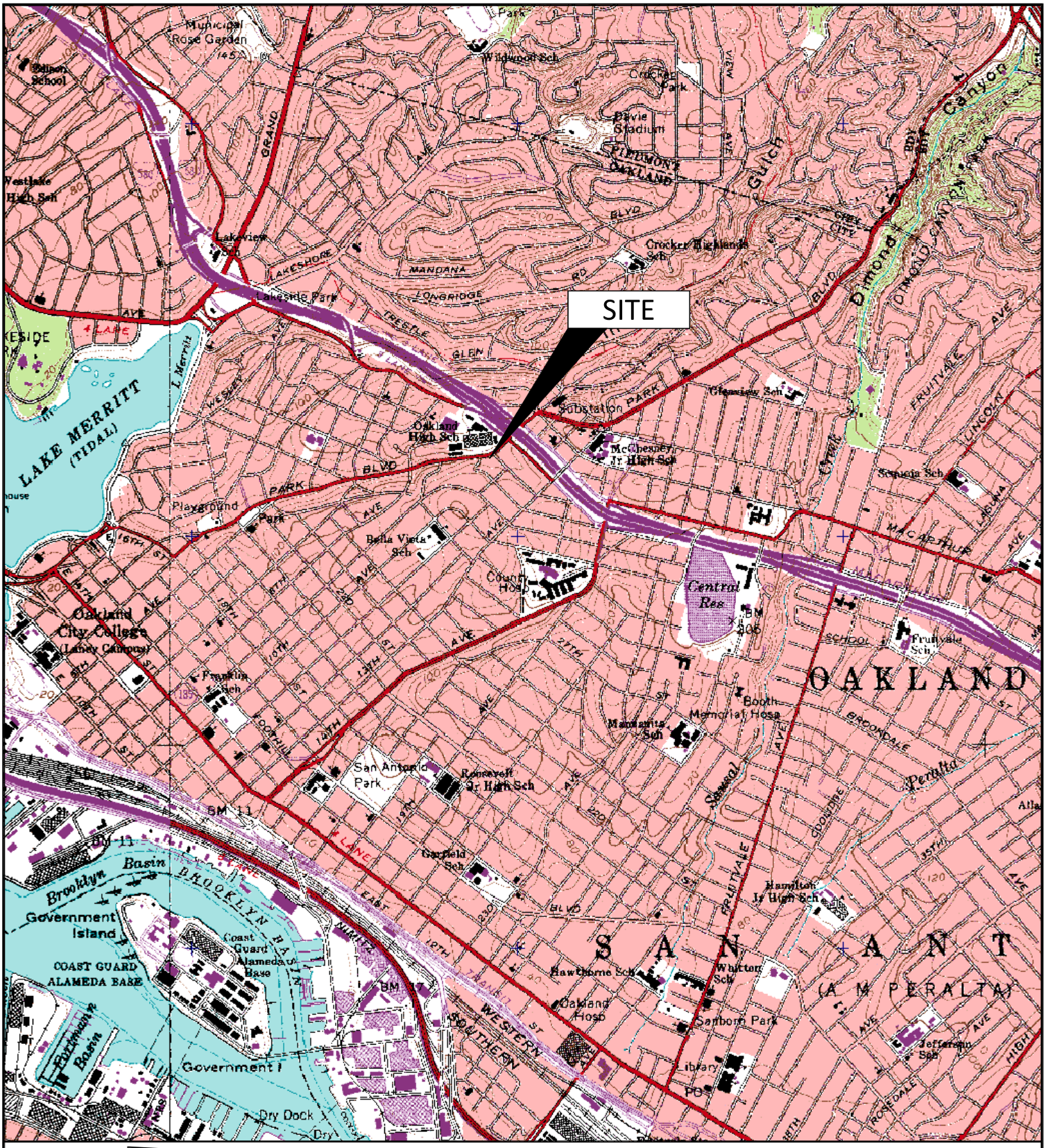
The findings presented in this report are based upon observations of field personnel, points investigated, results of laboratory tests performed by Calscience, and our understanding of ACEH guidelines. Our services were performed in accordance with the generally accepted standard of practice at the time this report was written. No other warranty, expressed or implied was made. This report has been prepared for the exclusive use of ARC. 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.

ATTACHMENTS:

Drawing 1:	Site Location Map
Drawing 2:	Groundwater Elevation Contour and Analytical Summary Map, March 26, 2013
Table 1:	Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses
Table 2:	Summary of Fuel Additive Analytical Data
Table 3:	Historical Groundwater Gradient - Direction and Magnitude
Appendix A:	Field Methods
Appendix B:	Field Data Sheets and Non-Hazardous Waste Data Form
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	gal:	gallons
ARC:	Atlantic Richfield Company	GRO:	Gasoline Range Organics (C6-12)
Broadbent	Broadbent & Associates	LNAPL:	Light Non-Aqueous Phase Liquid
BTEX:	Benzene, Toluene, Ethylbenzene, Total Xylenes	MTBE:	Methyl Tertiary Butyl Ether
	1,2-Dichloroethane	TAME:	Tert-Amyl Methyl Ether
1,2-DCA:	Di-Isopropyl Ether	TBA:	Tert-Butyl Alcohol
DIPE:	1,2-Dibromomethane	TOC:	Top of Casing
EDB:	feet per foot	μg/L:	Micrograms Per Liter
ft/ft:			

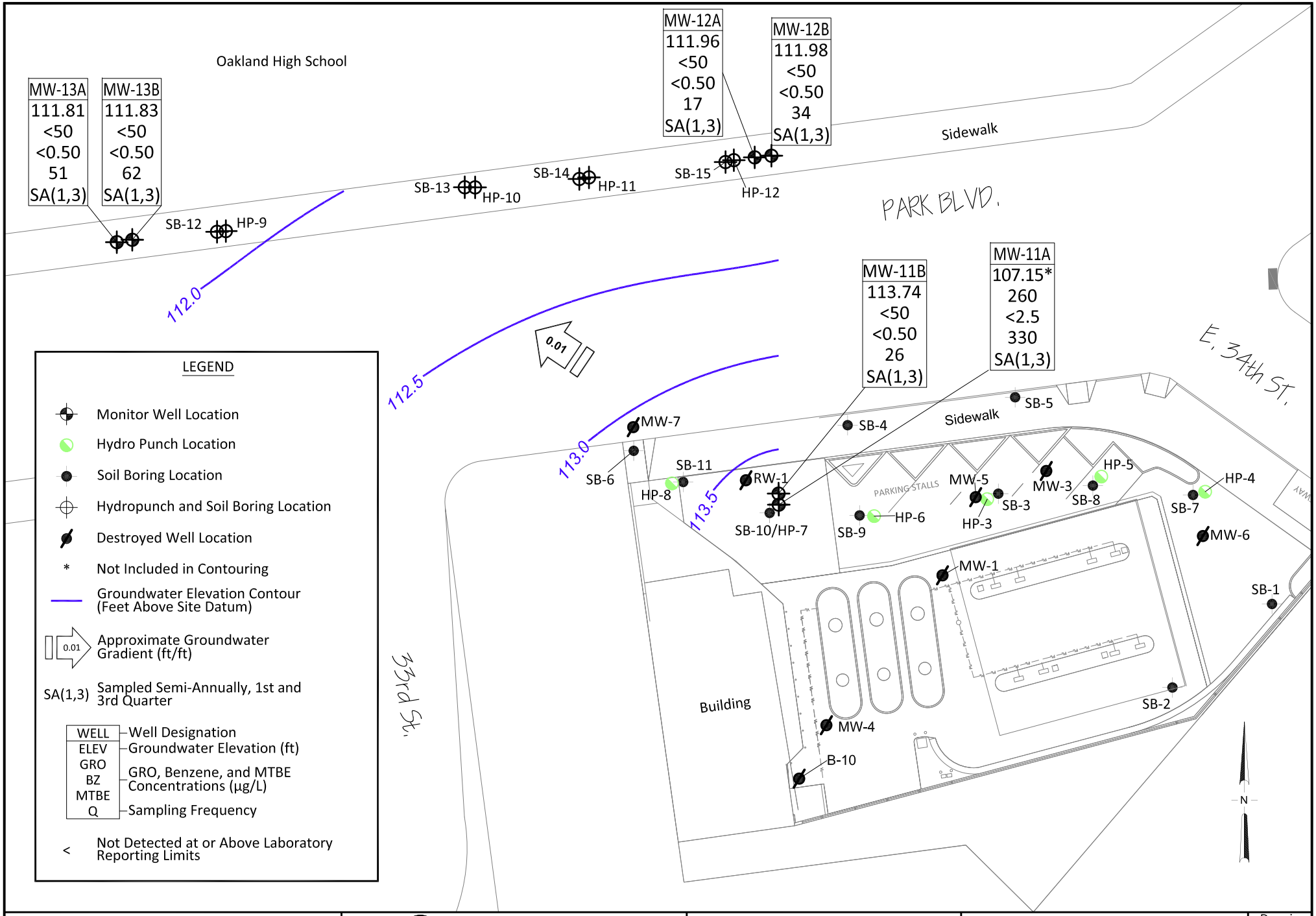


0 2000 4000

APPROXIMATE SCALE (ft)

IMAGE SOURCE: USGS

BROADBENT 1370 Ridgewood Dr., Suite 5 Chico, California 95973 Project No.: 06-88-614 Date: 4/16/2013	Station #2107 3310 Park Boulevard Oakland, California	Site Location Map	Drawing 1



0 30 60

SCALE (ft)

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 06-88-614 Date: 4/16/2013

Station #2107
3310 Park Boulevard
Oakland, California

Groundwater Elevation Contour and Analytical Summary Map
March 26, 2013

Drawing
2

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #2107, 3310 Park Boulevard, Oakland, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-11A															
3/9/2009	P	120.85	16.00	20.00	12.41	108.44	1,000	1.5	<1.0	13	4.8	60	9.20	12.74	
6/18/2009	P		16.00	20.00	14.58	106.27	260	11	<5.0	6.8	<5.0	280	--	9.83	a
9/1/2009	P		16.00	20.00	8.75	112.10	1,400	28	20	61	6.7	340	1.40	7.84	
11/11/2009	--		16.00	20.00	10.40	110.45	--	--	--	--	--	--	1.55	12.5	
2/19/2010	P		16.00	20.00	8.90	111.95	1,300	20	17	25	<5.0	340	2.01	12.13	
7/23/2010	P		16.00	20.00	8.37	112.48	1,300	20	22	23	<5.0	350	1.11	12.0	
3/10/2011	P		16.00	20.00	--	--	250	<5.0	5.4	<5.0	<5.0	76	4.17	12.3	b, c (GRO)
8/8/2011	NP		16.00	20.00	14.88	105.97	730	7.3	16	11	<5.0	310	1.47	12.1	
1/16/2012	P		16.00	20.00	14.08	106.77	--	--	--	--	--	--	1.43	13.77	
9/11/2012	P		16.00	20.00	14.91	105.94	220	4.4	11	6.4	<2.0	280	1.36	12.76	
3/26/2013	**P**		**16.00**	**20.00**	**13.70**	**107.15**	**260**	**<2.5**	**4.2**	**<2.5**	**<5.0**	**330**	**5.03**	**12.75**	
MW-11B															
3/9/2009	P	121.31	26.00	30.00	7.33	113.98	280	1.3	1.3	7.6	<0.50	240	9.56	7.14	
6/18/2009	P		26.00	30.00	7.38	113.93	130	<5.0	<5.0	<5.0	<5.0	200	--	6.96	a
9/1/2009	P		26.00	30.00	7.66	113.65	69	<5.0	<5.0	<5.0	<5.0	210	1.01	7.01	
11/11/2009	P		26.00	30.00	7.70	113.61	55	<5.0	<5.0	<5.0	<5.0	200	0.38	6.7	
2/19/2010	P		26.00	30.00	7.59	113.72	68	<2.5	<2.5	<2.5	<2.5	180	2.38	7.44	
7/23/2010	P		26.00	30.00	7.42	113.89	<50	<2.5	<2.5	<2.5	<2.5	110	1.57	7.02	
3/10/2011	P		26.00	30.00	7.25	114.06	<50	<1.0	<1.0	<1.0	<1.0	58	1.86	6.8	
8/8/2011	P		26.00	30.00	7.24	114.07	<50	<1.0	<1.0	<1.0	<1.0	60	1.33	7.8	
1/16/2012	P		26.00	30.00	7.96	113.35	<50	<1.0	<1.0	<1.0	<1.0	47	4.33	8.8	
9/11/2012	P		26.00	30.00	7.61	113.70	<50	<0.50	<0.50	<0.50	<1.0	27	1.17	7.07	
3/26/2013	**P**		**26.00**	**30.00**	**7.57**	**113.74**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**26**	**1.95**	**6.85**	
MW-12A															
3/9/2009	P	120.64	13.00	18.00	8.70	111.94	<50	<0.50	<0.50	<0.50	<0.50	41	4.62	6.76	
6/18/2009	P		13.00	18.00	8.58	112.06	<50	<1.0	<1.0	<1.0	<1.0	40	--	7.92	a
9/1/2009	P		13.00	18.00	9.21	111.43	<50	<0.50	<0.50	<0.50	<0.50	39	1.06	6.97	
11/11/2009	P		13.00	18.00	9.15	111.49	<50	<1.0	<1.0	<1.0	<1.0	41	0.51	6.2	
2/19/2010	P		13.00	18.00	9.13	111.51	<50	<0.50	<0.50	<0.50	<0.50	32	0.38	6.58	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #2107, 3310 Park Boulevard, Oakland, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-12A Cont.															
7/23/2010	P	120.64	13.00	18.00	9.18	111.46	<50	<0.50	<0.50	<0.50	<0.50	34	0.68	7.6	
3/10/2011	P		13.00	18.00	8.43	112.21	<50	<0.50	<0.50	<0.50	<0.50	27	1.66	6.7	
8/8/2011	P		13.00	18.00	8.33	112.31	<50	<0.50	<0.50	<0.50	<0.50	32	3.40	7.5	
1/16/2012	P		13.00	18.00	9.12	111.52	<50	<0.50	<0.50	<0.50	<0.50	18	0.84	7.32	
9/11/2012	P		13.00	18.00	8.95	111.69	<50	<0.50	<0.50	<0.50	<1.0	22	1.20	6.99	
3/26/2013	**P**		**13.00**	**18.00**	**8.68**	**111.96**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**17**	**1.07**	**6.76**	
MW-12B															
3/9/2009	P	120.84	27.00	30.00	14.89	105.95	<50	<0.50	0.55	<0.50	<0.50	150	5.87	7.74	
6/18/2009	P		27.00	30.00	13.51	107.33	140	<2.5	<2.5	<2.5	<2.5	380	--	8.60	a
9/1/2009	P		27.00	30.00	9.54	111.30	89	<10	<10	<10	<10	460	0.99	6.88	
11/11/2009	P		27.00	30.00	11.53	109.31	<50	<5.0	<5.0	<5.0	<5.0	600	1.00	6.46	
2/19/2010	P		27.00	30.00	11.07	109.77	52	<5.0	<5.0	<5.0	<5.0	620	3.32	6.89	
7/23/2010	P		27.00	30.00	10.75	110.09	<50	<10	<10	<10	<10	510	1.70	7.54	
3/10/2011	P		27.00	30.00	10.05	110.79	<50	<10	<10	<10	<10	700	2.71	6.9	
8/8/2011	P		27.00	30.00	9.35	111.49	<50	<10	<10	<10	<10	510	1.70	6.9	
1/16/2012	P		27.00	30.00	9.45	111.39	<50	<12	<12	<12	<12	840	3.36	7.0	
9/11/2012	P		27.00	30.00	9.31	111.53	<50	<5.0	<5.0	<5.0	<10	790	1.13	7.13	
3/26/2013	**p**		**27.00**	**30.00**	**8.86**	**111.98**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**34**	**4.93**	**7.03**	
MW-13A															
3/9/2009	P	114.55	11.50	16.50	9.53	105.02	<50	<0.50	<0.50	<0.50	<0.50	13	9.39	7.64	
6/18/2009	P		11.50	16.50	2.88	111.67	<50	<0.50	<0.50	<0.50	<0.50	23	--	7.21	a
9/1/2009	P		11.50	16.50	3.31	111.24	<50	<0.50	<0.50	<0.50	<0.50	34	0.96	6.90	
11/11/2009	P		11.50	16.50	3.66	110.89	<50	<0.50	<0.50	<0.50	<0.50	21	1.79	6.5	
2/19/2010	P		11.50	16.50	3.43	111.12	<50	<0.50	<0.50	<0.50	<0.50	15	0.92	6.69	
7/23/2010	P		11.50	16.50	3.22	111.33	<50	<0.50	<0.50	<0.50	<0.50	24	1.4	7.0	
3/10/2011	P		11.50	16.50	2.57	111.98	<50	<0.50	<0.50	<0.50	<0.50	12	0.76	6.7	
8/8/2011	P		11.50	16.50	8.43	106.12	<50	<0.50	<0.50	<0.50	<0.50	29	3.59	7.2	
1/16/2012	P		11.50	16.50	3.11	111.44	<50	<0.50	<0.50	<0.50	<0.50	37	1.25	7.08	
9/11/2012	P		11.50	16.50	3.03	111.52	<50	<0.50	<0.50	<0.50	<1.0	64	1.50	6.98	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #2107, 3310 Park Boulevard, Oakland, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-13A Cont.															
3/26/2013	**p**	**114.55**	**11.50**	**16.50**	**2.74**	**111.81**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**51**	**1.19**	**6.76**	
MW-13B															
3/9/2009	P	114.75	18.50	22.50	2.96	111.79	<50	<0.50	<0.50	<0.50	<0.50	13	8.44	6.99	
6/18/2009	P		18.50	22.50	2.85	111.90	<50	<0.50	<0.50	<0.50	<0.50	12	--	6.92	a
9/1/2009	P		18.50	22.50	3.36	111.39	<50	<0.50	<0.50	<0.50	<0.50	17	0.96	7.29	
11/11/2009	P		18.50	22.50	3.49	111.26	<50	<0.50	<0.50	<0.50	<0.50	21	2.45	6.39	
2/19/2010	P		18.50	22.50	3.10	111.65	<50	<0.50	<0.50	<0.50	<0.50	19	1.46	6.50	
7/23/2010	P		18.50	22.50	2.74	112.01	<50	<0.50	<0.50	<0.50	<0.50	15	1.16	7.19	
3/10/2011	P		18.50	22.50	3.72	111.03	<50	<0.50	<0.50	<0.50	<0.50	31	0.72	6.6	
8/8/2011	P		18.50	22.50	2.48	112.27	<50	<0.50	<0.50	<0.50	<0.50	32	1.51	6.8	
1/16/2012	P		18.50	22.50	3.47	111.28	<50	<0.50	<0.50	<0.50	<0.50	49	0.86	6.8	
9/11/2012	P		18.50	22.50	3.15	111.60	<50	<0.50	<0.50	<0.50	<1.0	63	1.62	7.05	
3/26/2013	**p**		**18.50**	**22.50**	**2.92**	**111.83**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**62**	**1.37**	**6.86**	

Symbols & Abbreviations:
-- = Not measured/applicable/analyzed/sampled
µg/L = Micrograms per liter
DO = Dissolved oxygen
DTW = Depth to water in ft below TOC
GRO = Gasoline range organics
mg/L = Milligrams per liter
MTBE = Methyl tert butyl ether
< = Not detected at or above specified laboratory reporting limit
NP = Well not purged prior to sampling
P = Well purged prior to sampling
TOC = Top of casing in ft above NAVD88 datum

Footnotes:
a = DO meter not working
b = Well full of water
c = Quantitation of unknown hydrocarbons(s) in sample based on gasoline

Notes:
Values for DO and pH were obtained through field measurements

Table 2. Summary of Fuel Additives Analytical Data

ARCO Service Station #2107, 3310 Park Boulevard, Oakland, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-11A									
3/9/2009	--	<20	60	<1.0	<1.0	<1.0	--	--	
6/18/2009	<3,000	<100	280	<5.0	<5.0	<5.0	<5.0	<5.0	
9/1/2009	<3,000	<100	340	<5.0	<5.0	5.3	<5.0	<5.0	
2/19/2010	<3,000	<100	340	<5.0	<5.0	6.1	<5.0	<5.0	
7/23/2010	<3,000	<100	350	<5.0	<5.0	6.5	<5.0	<5.0	
3/10/2011	<6,000	<100	76	<5.0	<5.0	<5.0	<5.0	<5.0	
8/8/2011	<3,000	<100	310	<5.0	<5.0	<5.0	<5.0	<5.0	
9/11/2012	<300	<20	280	<1.0	<1.0	4.1	<1.0	<1.0	
3/26/2013	**<750**	**<50**	**330**	**<2.5**	**<2.5**	**3.9**	**<2.5**	**<2.5**	
MW-11B									
3/9/2009	--	<10	240	<0.50	<0.50	3.1	--	--	
6/18/2009	<3,000	<100	200	<5.0	<5.0	<5.0	<5.0	<5.0	
9/1/2009	<3,000	<100	210	<5.0	<5.0	<5.0	<5.0	<5.0	
11/11/2009	<3,000	<100	200	<5.0	<5.0	<5.0	<5.0	<5.0	
2/19/2010	<1,500	<50	180	<2.5	<2.5	<2.5	<2.5	<2.5	
7/23/2010	<1,500	<50	110	<2.5	<2.5	<2.5	<2.5	<2.5	
3/10/2011	<600	<20	58	<1.0	<1.0	<1.0	<1.0	<1.0	
8/8/2011	<600	<20	60	<1.0	<1.0	<1.0	<1.0	<1.0	
1/16/2012	<600	33	47	<1.0	<1.0	<1.0	<1.0	<1.0	
9/11/2012	<150	<10	27	<0.50	<0.50	<0.50	<0.50	<0.50	
3/26/2013	**<150**	**<10**	**26**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-12A									
3/9/2009	--	<10	41	<0.50	<0.50	<0.50	--	--	
6/18/2009	<600	<20	40	<1.0	<1.0	<1.0	<1.0	<1.0	
9/1/2009	<300	<10	39	<0.50	<0.50	<0.50	<0.50	<0.50	
11/11/2009	<600	<20	41	<1.0	<1.0	<1.0	<1.0	<1.0	
2/19/2010	<300	<10	32	<0.50	<0.50	<0.50	<0.50	<0.50	
7/23/2010	<300	<10	34	<0.50	<0.50	<0.50	<0.50	<0.50	
3/10/2011	<300	<10	27	<0.50	<0.50	<0.50	<0.50	<0.50	
8/8/2011	<300	<10	32	<0.50	<0.50	<0.50	<0.50	<0.50	

Table 2. Summary of Fuel Additives Analytical Data

ARCO Service Station #2107, 3310 Park Boulevard, Oakland, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-12A Cont.									
1/16/2012	<300	19	18	<0.50	<0.50	<0.50	<0.50	<0.50	
9/11/2012	<150	<10	22	<0.50	<0.50	<0.50	<0.50	<0.50	
3/26/2013	**<150**	**<10**	**17**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-12B									
3/9/2009	--	<10	150	<0.50	<0.50	<0.50	--	--	
6/18/2009	<1,500	<50	380	<2.5	<2.5	<2.5	<2.5	<2.5	
9/1/2009	<6,000	<200	460	<10	<10	<10	<10	<10	
11/11/2009	<3,000	<100	600	<5.0	<5.0	<5.0	<5.0	<5.0	
2/19/2010	<3,000	<100	620	<5.0	<5.0	5.1	<5.0	<5.0	
7/23/2010	<6,000	<200	510	<10	<10	<10	<10	<10	
3/10/2011	<6,000	<200	700	<10	<10	<10	<10	<10	
8/8/2011	<6,000	<200	510	<10	<10	<10	<10	<10	
1/16/2012	<7,500	320	840	<12	<12	<12	<12	<12	
9/11/2012	<1,500	<100	790	<5.0	<5.0	8.7	<5.0	<5.0	
3/26/2013	**<150**	**<10**	**34**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-13A									
3/9/2009	--	<10	13	<0.50	<0.50	<0.50	--	--	
6/18/2009	<300	<10	23	<0.50	<0.50	<0.50	<0.50	<0.50	
9/1/2009	<300	<10	34	<0.50	<0.50	<0.50	<0.50	<0.50	
11/11/2009	<300	<10	21	<0.50	<0.50	<0.50	<0.50	<0.50	
2/19/2010	<300	<10	15	<0.50	<0.50	<0.50	<0.50	<0.50	
7/23/2010	<300	<10	24	<0.50	<0.50	<0.50	<0.50	<0.50	
3/10/2011	<300	<10	12	<0.50	<0.50	<0.50	<0.50	<0.50	
8/8/2011	<300	<10	29	<0.50	<0.50	<0.50	<0.50	<0.50	
1/16/2012	<300	26	37	<0.50	<0.50	<0.50	<0.50	<0.50	
9/11/2012	<150	<10	64	<0.50	<0.50	<0.50	<0.50	<0.50	
3/26/2013	**<150**	**<10**	**51**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-13B									
3/9/2009	--	<10	13	<0.50	<0.50	<0.50	--	--	
6/18/2009	<300	<10	12	<0.50	<0.50	<0.50	<0.50	<0.50	

Table 2. Summary of Fuel Additives Analytical Data

ARCO Service Station #2107, 3310 Park Boulevard, Oakland, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-13B Cont.									
9/1/2009	<300	<10	17	<0.50	<0.50	<0.50	<0.50	<0.50	
11/11/2009	<300	<10	21	<0.50	<0.50	<0.50	<0.50	<0.50	
2/19/2010	<300	<10	19	<0.50	<0.50	<0.50	<0.50	<0.50	
7/23/2010	<300	<10	15	<0.50	<0.50	<0.50	<0.50	<0.50	
3/10/2011	<300	<10	31	<0.50	<0.50	<0.50	<0.50	<0.50	
8/8/2011	<300	<10	32	<0.50	<0.50	<0.50	<0.50	<0.50	
1/16/2012	<300	19	49	<0.50	<0.50	<0.50	<0.50	<0.50	
9/11/2012	<150	<10	63	<0.50	<0.50	<0.50	<0.50	<0.50	
3/26/2013	**<150**	**<10**	**62**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	

Symbols & Abbreviations:
-- = Not analyzed/applicable/measurable
< = Not detected above reported detection limit
1,2-DCA = 1,2-Dichloroethane
µg/L = Micrograms per Liter
DIPE = Diisopropyl ether
EDB = 1, 2-Dibromoethane
ETBE = Ethyl tert-butyl ether
MTBE = Methyl tert-butyl ether
TAME = tert-Amyl methyl ether
TBA = tert-Butyl alcohol

Notes:
All volatile organic compounds analyzed using EPA Method 8260B

Table 3. Historical Groundwater Gradient - Direction and Magnitude

ARCO Service Station #2107, 3310 Park Boulevard, Oakland, CA

Date Measured	Approximate Gradient Direction	Approximate Gradient Magnitude (ft/ft)
3/9/2009	Northeast	0.06
6/18/2009	Northeast	0.06
9/1/2009	North-Northwest	0.03
11/11/2009	North	0.05
2/19/2010	North	0.03
7/23/2010	North	0.05
3/10/2011	North-Northwest	0.04
8/8/2011	North	0.03
1/16/2012	North-Northwest	0.02
9/11/2012	North-Northwest	0.03
3/26/2013	**North-Northwest**	**0.01**

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

[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.

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.

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.

---

[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.

APPENDIX B

FIELD DATA SHEETS
AND NON-HAZARDOUS WASTE DATA FORM

BROADBENT

DAILY REPORT

Page 1 of 1

Project: BP 2107 Project No.: 06-88-614

Field Representative(s): A. Martinez / J. Ramos Day: Tuesday Date: 3/26/13

Time Onsite: From: 0830 To: 1200 ; 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: Sunny; ≈65° F

Equipment In Use: LEL meter, peristaltic pump, tubing (1/4" & silicone), water level meter

Visitors: _____

TIME:	WORK DESCRIPTION:
0830	Arrived onsite; proceeded w/ safety meeting & documents
0910	Finished safety meeting; setup on MW-13A & MW-13B
1005	Setup on MW-12A & MW-12B
1055	Setup on MW-11A & MW-11B
	Kristene arrives on site; induct her w/ safety meeting
~~1225~~	~~Finished sam~~
1140	Kristene leaves site
1230	Finished sampling / Packed up / left site

Signature: _____

Revision: 1/24/2012

BROADBENT

GROUNDWATER MONITORING SITE SHEET

Project: BP 2107 Project No.: 06-88-614 Date: 3-26-13

Field Representative: AM/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					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-11A	6			14.91	1125			13.70	18.30	
MW-11B	5			7.61	1100			7.57	30.00	
MW-12A	3			8.95	1010			8.68	18.00	
MW-12B	4			9.31	1027			8.86	30.00	
MW-13A	2			3.03	0942			2.74	16.53	
MW-13B	1			3.15	0924			2.92	22.60	

* 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: _____

Revision: 8/19/11

BROADBENT

GROUNDWATER SAMPLING DATA SHEET

Project: BP 2107 Project No.: 06-88-614 Date: 3/26/13

Field Representative: AM/JR

Well ID: MW-11A 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)*

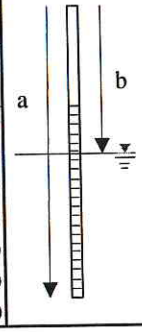
PURGING/SAMPLING METHOD Predetermined Well Volume (Low-Flow) Other: *(circle one)*

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): 18.80 (ft)
Initial Depth to Water (b): 13.70 (ft)
Pump In-take Depth = b + (a-b)/2: 16.25 (ft)
Maximum Allowable Drawdown = (a-b)/8: 0.64 (ft)
Low-Flow Purge Rate: 0.17 (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 Volume (L)	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
1136	0	21.98	9.98	7.66	5.71	-3	84.7	
1139	0.5	21.98	12.50	8.04	5.32	-96	—	
1142	1.0	21.75	12.69	8.09	5.18	-119	—	
1145	1.5	21.87	12.75	8.11	5.03	-175	96.0	~~Below~~ Low water level ∴ took sample
~~1148~~	~~2.0~~							
Previous Stabilized Parameters								

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

SAMPLE COLLECTION RECORD

Depth to Water at Sampling: 16.15 (ft)
Sample Collected Via: ___ Disp. Bailer ___ Dedicated Pump Tubing
X Disp. Pump Tubing Other:
Sample ID: MW-11A Sample Collection Time: 1150 (24:00)
Containers (#): 6 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: _____

BROADBENT

GROUNDWATER SAMPLING DATA SHEET

Project: BP 2107 Project No.: 06-88-614 Date: 3/26/13

Field Representative: AM / JR

Well ID: MW-11B 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)*

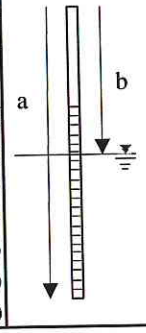
PURGING/SAMPLING METHOD Predetermined Well Volume (Low-Flow) Other: *(circle one)*

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): 30.00 (ft)
Initial Depth to Water (b): 7.57 (ft)
Pump In-take Depth = b + (a-b)/2: 18.79 (ft)
Maximum Allowable Drawdown = (a-b)/8: 2.80 (ft)
Low-Flow Purge Rate: 0.25 (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 Volume (L)	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
1109	0	21.20	7.09	0.697	2.60	~~184~~ 154	86.8	
1111	0.5	21.60	6.90	0.701	2.18	161	—	
1113	1.0	20.89	6.87	0.703	2.06	167	—	
1115	1.5	20.83	6.86	0.705	1.99	175	—	
1117	2.0	20.83	6.85	0.705	1.95	179	77.4	
Previous Stabilized Parameters								

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

SAMPLE COLLECTION RECORD

Depth to Water at Sampling: 8.65 (ft)
Sample Collected Via: ___ Disp. Bailer ___ Dedicated Pump Tubing
X Disp. Pump Tubing Other:
Sample ID: MW-11B Sample Collection Time: 1120 (24:00)
Containers (#): 6 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: _____

BROADBENT

GROUNDWATER SAMPLING DATA SHEET

Project: BP 2107 Project No.: 06-88-614 Date: 3/26/13

Field Representative: AM/JR

Well ID: MW-12A 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)*

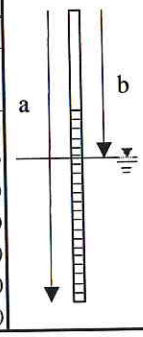
PURGING/SAMPLING METHOD Predetermined Well Volume (Low-Flow) Other: *(circle one)*

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): 18.00 (ft)
Initial Depth to Water (b): 8.68 (ft)
Pump In-take Depth = b + (a-b)/2: 13.34 (ft)
Maximum Allowable Drawdown = (a-b)/8: 1.17 (ft)
Low-Flow Purge Rate: 0.25 (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 Volume (L)	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
1014	0	20.27	7.00	0.735	1.89	125	70.7	
1016	0.5	20.40	6.79	0.732	1.37	116	—	
1018	1.0	20.41	6.76	0.732	1.21	112	—	
1020	1.5	20.44	6.76	0.732	1.10	106	—	
1022	2.0	20.43	6.76	0.732	1.07	104	69.1	
Previous Stabilized Parameters								

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

SAMPLE COLLECTION RECORD

Depth to Water at Sampling: 8.85 (ft)
Sample Collected Via: ___ Disp. Bailer ___ Dedicated Pump Tubing
X Disp. Pump Tubing Other:
Sample ID: MW-12A Sample Collection Time: 1025 (24:00)
Containers (#): 6 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: _____

BROADBENT

GROUNDWATER SAMPLING DATA SHEET

Project: BP 2107 Project No.: 06-88-614 Date: 3/26/13

Field Representative: AM / JR

Well ID: MW-12B 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)*

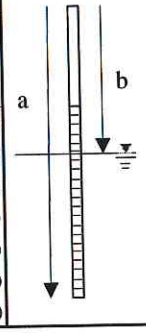
PURGING/SAMPLING METHOD Predetermined Well Volume (Low-Flow) Other: *(circle one)*

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): 30.00 (ft)
Initial Depth to Water (b): 8.86 (ft)
Pump In-take Depth = b + (a-b)/2: 19.43 (ft)
Maximum Allowable Drawdown = (a-b)/8: 2.64 (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 Volume (L)	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
1031	0	20.26	7.04	1.06	5.83	133	69.9	
1033	0.5	20.77	6.99	1.06	5.20	138	—	
1035	1.0	20.79	7.01	1.06	5.05	139	—	
1037	1.5	20.89	7.02	1.06	4.95	140	—	
1039	2.0	20.98	7.03	1.06	4.23	143	72.5	
Previous Stabilized Parameters								

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

SAMPLE COLLECTION RECORD

Depth to Water at Sampling: 9.10 (ft)
Sample Collected Via: ___ Disp. Bailer ___ Dedicated Pump Tubing
X Disp. Pump Tubing Other:
Sample ID: MW-12B Sample Collection Time: 1040 (24:00)
Containers (#): 6 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: _____

BROADBENT

GROUNDWATER SAMPLING DATA SHEET

Project: BP 2107 Project No.: 06-88-614 Date: 3/26/13

Field Representative: AM / JR

Well ID: MW-13A 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)*

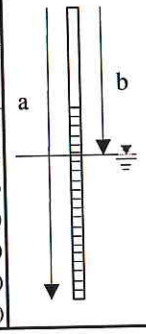
PURGING/SAMPLING METHOD Predetermined Well Volume (Low-Flow) Other: *(circle one)*

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): 16.53 (ft)
Initial Depth to Water (b): 2.74 (ft)
Pump In-take Depth = b + (a-b)/2: 9.64 (ft)
Maximum Allowable Drawdown = (a-b)/8: 1.72 (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 Volume (L)	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
0948	0	19.50	7.07	0.964	2.04	109	115	
0950	0.5	19.89	6.85	0.959	1.54	105	—	
0952	1.0	19.98	6.78	0.957	1.34	99	—	
0954	1.5	20.04	6.77	0.957	1.23	96	—	
0956	2.0	20.06	6.76	0.956	1.19	94	78.7	
Previous Stabilized Parameters								

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

SAMPLE COLLECTION RECORD

Depth to Water at Sampling: 2.96 (ft)
Sample Collected Via: ___ Disp. Bailer ___ Dedicated Pump Tubing
X Disp. Pump Tubing Other:
Sample ID: MW-13A Sample Collection Time: 1000 (24:00)
Containers (#): 6 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: _____

Revision: 7/3/12

BROADBENT

GROUNDWATER SAMPLING DATA SHEET

Project: BP 2107 Project No.: 06-88-614 Date: 3/26/13

Field Representative: AM / JR

Well ID: MW-13B 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)*

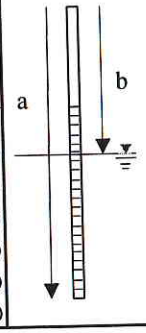
PURGING/SAMPLING METHOD Predetermined Well Volume (Low-Flow) Other: *(circle one)*

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): 22.60 (ft)
Initial Depth to Water (b): 2.92 (ft)
Pump In-take Depth = b + (a-b)/2: 12.76 (ft)
Maximum Allowable Drawdown = (a-b)/8: 2.46 (ft)
Low-Flow Purge Rate: 0.25 (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 Volume (L)	Temperature °C	pH	Conductivity µS or mS	DO mg/L	ORP mV	Turbidity NTU	NOTES Odor, color, sheen or other
0930	0	16.18	8.31	1.07	2.60	439	251	
0932	0.5	17.73	7.45	1.04	1.85	69	—	
0934	1.0	18.37	7.10	1.02	1.61	75	—	
0936	1.5	18.69	6.96	1.02	1.45	76	—	
0938	2.0	18.98	6.86	1.01	1.37	77	223	
Previous Stabilized Parameters								

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

SAMPLE COLLECTION RECORD

Depth to Water at Sampling: 2.95 (ft)
Sample Collected Via: ___ Disp. Bailer ___ Dedicated Pump Tubing
X Disp. Pump Tubing Other:
Sample ID: MW-13B Sample Collection Time: 0940 (24:00)
Containers (#): 6 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: _____

APPENDIX C

LABORATORY REPORT
AND CHAIN-OF-CUSTODY DOCUMENTATION

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

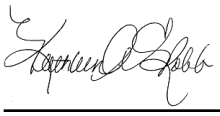
ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Irvine
17461 Derian Ave
Suite 100
Irvine, CA 92614-5817
Tel: (949)261-1022

TestAmerica Job ID: 440-41942-1
Client Project/Site: ARCO 2107, Oakland

For:
Broadbent & Associates, Inc.
875 Cotting Lane
Suite G
Vacaville, California 95688

Attn: Kristene Tidwell



Authorized for release by:
4/9/2013 4:30:13 PM

Kathleen Robb
Project Manager II
kathleen.robb@testamericainc.com

Table of Contents

Sample Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-41942-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-41942-1	MW-11A	Water	03/26/13 11:50	03/27/13 09:35
440-41942-2	MW-11B	Water	03/26/13 11:20	03/27/13 09:35
440-41942-3	MW-12A	Water	03/26/13 10:25	03/27/13 09:35
440-41942-4	MW-12B	Water	03/26/13 10:40	03/27/13 09:35
440-41942-5	MW-13A	Water	03/26/13 10:00	03/27/13 09:35
440-41942-6	MW-13B	Water	03/26/13 09:40	03/27/13 09:35

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-41942-1

Job ID: 440-41942-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative
440-41942-1

Comments
No additional comments.

Receipt
The samples were received on 3/27/2013 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.3º C.

Except:

For sample 440-41942-7 (TB-2107-03262013):
1) No date or time on the COC or sample label. The sample was logged in using the same sampling date as the other samples submitted and a sampling time of 12:01am.
2) 1 of 2 vials submitted was received broken.

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

GC VOA
Method(s) 8015B: Surrogate recovery for the following sample(s) was outside control limits: MW-11A (440-41942-1). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No other analytical or quality issues were noted.

VOA Prep
No analytical or quality issues were noted.

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-41942-1

Client Sample ID: MW-11A
Date Collected: 03/26/13 11:50
Date Received: 03/27/13 09:35

Lab Sample ID: 440-41942-1
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		2.5		ug/L			04/02/13 03:37	5
1,2-Dichloroethane	ND		2.5		ug/L			04/02/13 03:37	5
Benzene	ND		2.5		ug/L			04/02/13 03:37	5
Ethanol	ND		750		ug/L			04/02/13 03:37	5
Ethylbenzene	ND		2.5		ug/L			04/02/13 03:37	5
Ethyl-t-butyl ether (ETBE)	ND		2.5		ug/L			04/02/13 03:37	5
Isopropyl Ether (DIPE)	ND		2.5		ug/L			04/02/13 03:37	5
m,p-Xylene	ND		5.0		ug/L			04/02/13 03:37	5
Methyl-t-Butyl Ether (MTBE)	**330**		2.5		ug/L			04/02/13 03:37	5
o-Xylene	ND		2.5		ug/L			04/02/13 03:37	5
Tert-amyl-methyl ether (TAME)	**3.9**		2.5		ug/L			04/02/13 03:37	5
tert-Butyl alcohol (TBA)	ND		50		ug/L			04/02/13 03:37	5
Toluene	**4.2**		2.5		ug/L			04/02/13 03:37	5
Xylenes, Total	ND		5.0		ug/L			04/02/13 03:37	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*		*04/02/13 03:37*	*5*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*04/02/13 03:37*	*5*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/02/13 03:37*	*5*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	**260**		50		ug/L			04/03/13 18:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*151*	*LH*	*65 - 140*		*04/03/13 18:23*	*1*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-41942-1

Client Sample ID: MW-11B
Date Collected: 03/26/13 11:20
Date Received: 03/27/13 09:35

Lab Sample ID: 440-41942-2
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			04/02/13 02:05	1
1,2-Dichloroethane	ND		0.50		ug/L			04/02/13 02:05	1
Benzene	ND		0.50		ug/L			04/02/13 02:05	1
Ethanol	ND		150		ug/L			04/02/13 02:05	1
Ethylbenzene	ND		0.50		ug/L			04/02/13 02:05	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			04/02/13 02:05	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			04/02/13 02:05	1
m,p-Xylene	ND		1.0		ug/L			04/02/13 02:05	1
Methyl-t-Butyl Ether (MTBE)	**26**		0.50		ug/L			04/02/13 02:05	1
o-Xylene	ND		0.50		ug/L			04/02/13 02:05	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			04/02/13 02:05	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			04/02/13 02:05	1
Toluene	ND		0.50		ug/L			04/02/13 02:05	1
Xylenes, Total	ND		1.0		ug/L			04/02/13 02:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*04/02/13 02:05*	*1*
Dibromofluoromethane (Surr)	*92*		*80 - 120*		*04/02/13 02:05*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*04/02/13 02:05*	*1*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			04/03/13 18:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*113*		*65 - 140*		*04/03/13 18:52*	*1*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-41942-1

Client Sample ID: MW-12A
Date Collected: 03/26/13 10:25
Date Received: 03/27/13 09:35

Lab Sample ID: 440-41942-3
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			04/02/13 02:35	1
1,2-Dichloroethane	ND		0.50		ug/L			04/02/13 02:35	1
Benzene	ND		0.50		ug/L			04/02/13 02:35	1
Ethanol	ND		150		ug/L			04/02/13 02:35	1
Ethylbenzene	ND		0.50		ug/L			04/02/13 02:35	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			04/02/13 02:35	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			04/02/13 02:35	1
m,p-Xylene	ND		1.0		ug/L			04/02/13 02:35	1
Methyl-t-Butyl Ether (MTBE)	**17**		0.50		ug/L			04/02/13 02:35	1
o-Xylene	ND		0.50		ug/L			04/02/13 02:35	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			04/02/13 02:35	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			04/02/13 02:35	1
Toluene	ND		0.50		ug/L			04/02/13 02:35	1
Xylenes, Total	ND		1.0		ug/L			04/02/13 02:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*		*04/02/13 02:35*	*1*
Dibromofluoromethane (Surr)	*95*		*80 - 120*		*04/02/13 02:35*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/02/13 02:35*	*1*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			04/02/13 23:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*111*		*65 - 140*		*04/02/13 23:10*	*1*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-41942-1

Client Sample ID: MW-12B
Date Collected: 03/26/13 10:40
Date Received: 03/27/13 09:35

Lab Sample ID: 440-41942-4
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			04/02/13 03:06	1
1,2-Dichloroethane	ND		0.50		ug/L			04/02/13 03:06	1
Benzene	ND		0.50		ug/L			04/02/13 03:06	1
Ethanol	ND		150		ug/L			04/02/13 03:06	1
Ethylbenzene	ND		0.50		ug/L			04/02/13 03:06	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			04/02/13 03:06	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			04/02/13 03:06	1
m,p-Xylene	ND		1.0		ug/L			04/02/13 03:06	1
Methyl-t-Butyl Ether (MTBE)	**34**		0.50		ug/L			04/02/13 03:06	1
o-Xylene	ND		0.50		ug/L			04/02/13 03:06	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			04/02/13 03:06	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			04/02/13 03:06	1
Toluene	ND		0.50		ug/L			04/02/13 03:06	1
Xylenes, Total	ND		1.0		ug/L			04/02/13 03:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*04/02/13 03:06*	*1*
Dibromofluoromethane (Surr)	*96*		*80 - 120*		*04/02/13 03:06*	*1*
Toluene-d8 (Surr)	*107*		*80 - 120*		*04/02/13 03:06*	*1*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			04/02/13 23:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*112*		*65 - 140*		*04/02/13 23:38*	*1*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-41942-1

Client Sample ID: MW-13A
Date Collected: 03/26/13 10:00
Date Received: 03/27/13 09:35

Lab Sample ID: 440-41942-5
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			04/01/13 22:16	1
1,2-Dichloroethane	ND		0.50		ug/L			04/01/13 22:16	1
Benzene	ND		0.50		ug/L			04/01/13 22:16	1
Ethanol	ND		150		ug/L			04/01/13 22:16	1
Ethylbenzene	ND		0.50		ug/L			04/01/13 22:16	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			04/01/13 22:16	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			04/01/13 22:16	1
m,p-Xylene	ND		1.0		ug/L			04/01/13 22:16	1
Methyl-t-Butyl Ether (MTBE)	**51**		0.50		ug/L			04/01/13 22:16	1
o-Xylene	ND		0.50		ug/L			04/01/13 22:16	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			04/01/13 22:16	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			04/01/13 22:16	1
Toluene	ND		0.50		ug/L			04/01/13 22:16	1
Xylenes, Total	ND		1.0		ug/L			04/01/13 22:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*04/01/13 22:16*	*1*
Dibromofluoromethane (Surr)	*87*		*80 - 120*		*04/01/13 22:16*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/01/13 22:16*	*1*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			04/03/13 00:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*115*		*65 - 140*		*04/03/13 00:06*	*1*

Client Sample ID: MW-13B
Lab Sample ID: 440-41942-6
Date Collected: 03/26/13 09:40
Matrix: Water
Date Received: 03/27/13 09:35

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			04/02/13 04:07	1
1,2-Dichloroethane	ND		0.50		ug/L			04/02/13 04:07	1
Benzene	ND		0.50		ug/L			04/02/13 04:07	1
Ethanol	ND		150		ug/L			04/02/13 04:07	1
Ethylbenzene	ND		0.50		ug/L			04/02/13 04:07	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			04/02/13 04:07	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			04/02/13 04:07	1
m,p-Xylene	ND		1.0		ug/L			04/02/13 04:07	1
Methyl-t-Butyl Ether (MTBE)	**62**		0.50		ug/L			04/02/13 04:07	1
o-Xylene	ND		0.50		ug/L			04/02/13 04:07	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			04/02/13 04:07	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			04/02/13 04:07	1
Toluene	ND		0.50		ug/L			04/02/13 04:07	1
Xylenes, Total	ND		1.0		ug/L			04/02/13 04:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*04/02/13 04:07*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*04/02/13 04:07*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*04/02/13 04:07*	*1*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			04/03/13 00:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*111*		*65 - 140*		*04/03/13 00:34*	*1*

Method Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-41942-1

Method	Method Description	Protocol	Laboratory
8260B/5030B	Volatile Organic Compounds (GC/MS)	SW846	TAL IRV
8015B/5030B	Gasoline Range Organics (GC)	SW846	TAL IRV

Protocol References:

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

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Client Sample ID: MW-11A — **Lab Sample ID: 440-41942-1**
Date Collected: 03/26/13 11:50 — **Matrix: Water**
Date Received: 03/27/13 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		5	10 mL	10 mL	95484	04/02/13 03:37	LB	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	95730	04/03/13 18:23	IM	TAL IRV

Client Sample ID: MW-11B — **Lab Sample ID: 440-41942-2**
Date Collected: 03/26/13 11:20 — **Matrix: Water**
Date Received: 03/27/13 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	95484	04/02/13 02:05	LB	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	95730	04/03/13 18:52	IM	TAL IRV

Client Sample ID: MW-12A — **Lab Sample ID: 440-41942-3**
Date Collected: 03/26/13 10:25 — **Matrix: Water**
Date Received: 03/27/13 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	95484	04/02/13 02:35	LB	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	95662	04/02/13 23:10	TL	TAL IRV

Client Sample ID: MW-12B — **Lab Sample ID: 440-41942-4**
Date Collected: 03/26/13 10:40 — **Matrix: Water**
Date Received: 03/27/13 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	95484	04/02/13 03:06	LB	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	95662	04/02/13 23:38	TL	TAL IRV

Client Sample ID: MW-13A — **Lab Sample ID: 440-41942-5**
Date Collected: 03/26/13 10:00 — **Matrix: Water**
Date Received: 03/27/13 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	95484	04/01/13 22:16	LB	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	95662	04/03/13 00:06	TL	TAL IRV

Client Sample ID: MW-13B — **Lab Sample ID: 440-41942-6**
Date Collected: 03/26/13 09:40 — **Matrix: Water**
Date Received: 03/27/13 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	95484	04/02/13 04:07	LB	TAL IRV

Lab Chronicle

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-41942-1

Client Sample ID: MW-13B
Date Collected: 03/26/13 09:40
Date Received: 03/27/13 09:35

Lab Sample ID: 440-41942-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	95662	04/03/13 00:34	TL	TAL IRV

Laboratory References:

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 440-95484/4
Matrix: Water
Analysis Batch: 95484

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			04/01/13 20:45	1
1,2-Dichloroethane	ND		0.50		ug/L			04/01/13 20:45	1
Benzene	ND		0.50		ug/L			04/01/13 20:45	1
Ethanol	ND		150		ug/L			04/01/13 20:45	1
Ethylbenzene	ND		0.50		ug/L			04/01/13 20:45	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			04/01/13 20:45	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			04/01/13 20:45	1
m,p-Xylene	ND		1.0		ug/L			04/01/13 20:45	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50		ug/L			04/01/13 20:45	1
o-Xylene	ND		0.50		ug/L			04/01/13 20:45	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			04/01/13 20:45	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			04/01/13 20:45	1
Toluene	ND		0.50		ug/L			04/01/13 20:45	1
Xylenes, Total	ND		1.0		ug/L			04/01/13 20:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/01/13 20:45*	*1*
Dibromofluoromethane (Surr)	*90*		*80 - 120*		*04/01/13 20:45*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*04/01/13 20:45*	*1*

Lab Sample ID: LCS 440-95484/5
Matrix: Water
Analysis Batch: 95484

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,2-Dibromoethane (EDB)			25.0	24.6		ug/L		98	75 - 125		
1,2-Dichloroethane			25.0	23.4		ug/L		94	60 - 140		
Benzene			25.0	22.2		ug/L		89	70 - 120		
Ethanol			250	254		ug/L		102	40 - 155		
Ethylbenzene			25.0	23.4		ug/L		94	75 - 125		
Ethyl-t-butyl ether (ETBE)			25.0	23.0		ug/L		92	65 - 135		
Isopropyl Ether (DIPE)			25.0	23.2		ug/L		93	60 - 135		
m,p-Xylene			50.0	47.7		ug/L		95	75 - 125		
Methyl-t-Butyl Ether (MTBE)			25.0	23.0		ug/L		92	60 - 135		
o-Xylene			25.0	24.2		ug/L		97	75 - 125		
Tert-amyl-methyl ether (TAME)			25.0	23.8		ug/L		95	60 - 135		
tert-Butyl alcohol (TBA)			125	119		ug/L		96	70 - 135		
Toluene			25.0	24.0		ug/L		96	70 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*
Dibromofluoromethane (Surr)	*93*		*80 - 120*
Toluene-d8 (Surr)	*105*		*80 - 120*

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-41942-5 MS
Matrix: Water
Analysis Batch: 95484

Client Sample ID: MW-13A
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane (EDB)	ND		25.0	24.7		ug/L		99	70 - 130
1,2-Dichloroethane	ND		25.0	22.6		ug/L		90	60 - 140
Benzene	ND		25.0	21.4		ug/L		86	65 - 125
Ethanol	ND		250	245		ug/L		98	40 - 155
Ethylbenzene	ND		25.0	23.2		ug/L		93	65 - 130
Ethyl-t-butyl ether (ETBE)	ND		25.0	22.6		ug/L		91	60 - 135
Isopropyl Ether (DIPE)	ND		25.0	22.2		ug/L		89	60 - 140
m,p-Xylene	ND		50.0	47.4		ug/L		95	65 - 130
Methyl-t-Butyl Ether (MTBE)	51		25.0	73.2		ug/L		89	55 - 145
o-Xylene	ND		25.0	24.1		ug/L		96	65 - 125
Tert-amyl-methyl ether (TAME)	ND		25.0	23.4		ug/L		94	60 - 140
tert-Butyl alcohol (TBA)	ND		125	118		ug/L		95	65 - 140
Toluene	ND		25.0	23.4		ug/L		93	70 - 125

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*
Dibromofluoromethane (Surr)	*90*		*80 - 120*
Toluene-d8 (Surr)	*105*		*80 - 120*

Lab Sample ID: 440-41942-5 MSD
Matrix: Water
Analysis Batch: 95484

Client Sample ID: MW-13A
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)	ND		25.0	24.0		ug/L		96	70 - 130	3	25
1,2-Dichloroethane	ND		25.0	22.6		ug/L		90	60 - 140	0	20
Benzene	ND		25.0	21.6		ug/L		86	65 - 125	1	20
Ethanol	ND		250	251		ug/L		100	40 - 155	3	30
Ethylbenzene	ND		25.0	22.9		ug/L		92	65 - 130	1	20
Ethyl-t-butyl ether (ETBE)	ND		25.0	21.9		ug/L		88	60 - 135	3	25
Isopropyl Ether (DIPE)	ND		25.0	21.8		ug/L		87	60 - 140	2	25
m,p-Xylene	ND		50.0	47.2		ug/L		94	65 - 130	1	25
Methyl-t-Butyl Ether (MTBE)	51		25.0	70.6		ug/L		79	55 - 145	4	25
o-Xylene	ND		25.0	23.6		ug/L		95	65 - 125	2	20
Tert-amyl-methyl ether (TAME)	ND		25.0	22.7		ug/L		91	60 - 140	3	30
tert-Butyl alcohol (TBA)	ND		125	120		ug/L		96	65 - 140	2	25
Toluene	ND		25.0	23.3		ug/L		93	70 - 125	0	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*
Dibromofluoromethane (Surr)	*89*		*80 - 120*
Toluene-d8 (Surr)	*107*		*80 - 120*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Lab Sample ID: MB 440-95662/3
Matrix: Water
Analysis Batch: 95662

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			04/02/13 16:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*123*		*65 - 140*		*04/02/13 16:52*	*1*

Lab Sample ID: LCS 440-95662/2
Matrix: Water
Analysis Batch: 95662

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			800	869		ug/L		109	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*65 - 140*

Lab Sample ID: 440-41873-A-2 MS
Matrix: Water
Analysis Batch: 95662

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)	ND		800	818		ug/L		97	65 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*86*		*65 - 140*

Lab Sample ID: 440-41873-A-2 MSD
Matrix: Water
Analysis Batch: 95662

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	ND		800	801		ug/L		95	65 - 140	2	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*98*		*65 - 140*

Lab Sample ID: MB 440-95730/32
Matrix: Water
Analysis Batch: 95730

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			04/03/13 06:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*65 - 140*		*04/03/13 06:40*	*1*

Method: 8015B/5030B - Gasoline Range Organics (GC) (Continued)

Lab Sample ID: LCS 440-95730/31
Matrix: Water
Analysis Batch: 95730

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			800	792		ug/L		99	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*95*		*65 - 140*

Lab Sample ID: 440-41885-C-1 MS
Matrix: Water
Analysis Batch: 95730

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)	ND		800	748		ug/L		94	65 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*65 - 140*

Lab Sample ID: 440-41885-C-1 MSD
Matrix: Water
Analysis Batch: 95730

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	ND		800	760		ug/L		95	65 - 140	2	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*107*		*65 - 140*

GC/MS VOA

Analysis Batch: 95484

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41942-1	MW-11A	Total/NA	Water	8260B/5030B	
440-41942-2	MW-11B	Total/NA	Water	8260B/5030B	
440-41942-3	MW-12A	Total/NA	Water	8260B/5030B	
440-41942-4	MW-12B	Total/NA	Water	8260B/5030B	
440-41942-5	MW-13A	Total/NA	Water	8260B/5030B	
440-41942-5 MS	MW-13A	Total/NA	Water	8260B/5030B	
440-41942-5 MSD	MW-13A	Total/NA	Water	8260B/5030B	
440-41942-6	MW-13B	Total/NA	Water	8260B/5030B	
LCS 440-95484/5	Lab Control Sample	Total/NA	Water	8260B/5030B	
MB 440-95484/4	Method Blank	Total/NA	Water	8260B/5030B	

GC VOA

Analysis Batch: 95662

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41873-A-2 MS	Matrix Spike	Total/NA	Water	8015B/5030B	
440-41873-A-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8015B/5030B	
440-41942-3	MW-12A	Total/NA	Water	8015B/5030B	
440-41942-4	MW-12B	Total/NA	Water	8015B/5030B	
440-41942-5	MW-13A	Total/NA	Water	8015B/5030B	
440-41942-6	MW-13B	Total/NA	Water	8015B/5030B	
LCS 440-95662/2	Lab Control Sample	Total/NA	Water	8015B/5030B	
MB 440-95662/3	Method Blank	Total/NA	Water	8015B/5030B	

Analysis Batch: 95730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41885-C-1 MS	Matrix Spike	Total/NA	Water	8015B/5030B	
440-41885-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8015B/5030B	
440-41942-1	MW-11A	Total/NA	Water	8015B/5030B	
440-41942-2	MW-11B	Total/NA	Water	8015B/5030B	
LCS 440-95730/31	Lab Control Sample	Total/NA	Water	8015B/5030B	
MB 440-95730/32	Method Blank	Total/NA	Water	8015B/5030B	

Qualifiers

GC VOA

Qualifier	Qualifier Description
LH	Surrogate Recoveries were higher than QC limits

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)

Certification Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 2107, Oakland

TestAmerica Job ID: 440-41942-1

Laboratory: TestAmerica Irvine

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	CA01531	06-30-13
Arizona	State Program	9	AZ0671	10-13-13
California	LA Cty Sanitation Districts	9	10256	01-31-14
California	NELAP	9	1108CA	01-31-14
California	State Program	9	2706	06-30-14
Guam	State Program	9	Cert. No. 12.002r	03-28-13 *
Hawaii	State Program	9	N/A	01-31-14
Nevada	State Program	9	CA015312007A	07-31-13
Northern Mariana Islands	State Program	9	MP0002	01-31-14
Oregon	NELAP	10	4005	09-12-13
USDA	Federal		P330-09-00080	06-06-14
USEPA UCMR	Federal	1	CA01531	01-31-15

* Expired certification is currently pending renewal and is considered valid.

bp rm Laboratory Management Program LaMP Chain of Custody Record

Page 1 of 1

BP Site Node Path: 06-88-614 | Req Due Date (mm/dd/yy): | Rush TAT: Yes ___ No X

BP Facility No: 2107 | Lab Work Order Number: 440-41942

Lab Name: Test America	Facility Address: 3310 Park Blvd.	Consultant/Contractor: Broadbent and Associates, Inc.
Lab Address: 17461 Derian Suite #100, Irvine, CA 92641	City, State, ZIP Code: Oakland, CA	Consultant/Contractor Project No: 06-88-614
Lab PM: Kathleen Robb	Lead Regulatory Agency: ACEH	Address: 875 Cotting Lane, Ste. G, Vacaville, CA 95688
Lab Phone: 949-261-1022	California Global ID No.: T06019734306	Consultant/Contractor PM: Kristene Tidwell
Lab Shipping Accnt: 1103-6633-7	Enfos Proposal No: 005WT-0001	Phone: 707-455-7290 Fax: 707-455-7295
Lab Bottle Order No:	Accounting Mode: Provision X OOC-BU ___ OOC-RM ___	Email EDD To: ktidwell@broadbentinc.com and to lab.enfosdoc@bp.com
Other Info:	Stage: Execute (40) Activity: Project Spend (80)	Invoice To: BP x Contractor ___

BP Project Manager (PM): Shannon Couch

BP PM Phone: 925-275-3804

BP PM Email: shannon.couch@bp.com

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix: Is this location a well?	No. Containers / Preservative: Total Number of Containers	Unpreserved	H2SO4	HNO3	HCl	Methanol	Requested Analyses: GRO by 8015M	BTEX/5 FO + EDB by 8260	1,2-DCA by 8260	Ethanol by 8260	Report Type & QC Level / Comments
	MW-11A	3/26/2013	1150		x			6				6		x	x	x	x	
	MW-11B	3/26/2013	1120		x			6				6		x	x	x	x	
	MW-12A	3/26/2013	1035		x			6				6		x	x	x	x	
	MW-12B	3/26/2013	1040		x			6				6		x	x	x	x	
	MW-13A	3/26/2013	1000		x			6				6		x	x	x	x	
	MW-13B	3/26/2013	0940		x			6				6		x	x	x	x	
	TB-2107-03262013	--	--		x			2				X						On Hold

Standard x

Full Data Package ___

Comments

Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Sampler's Name: Alex Martinez & James Ramos	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Broadbent and Associates	BAB	3/26/13	1700			
Shipment Method: Fed EX Ship Date: 3/26/13		3-26-13	1700			
Shipment Tracking No:					3/27/13	0935

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 2.6/2.3 F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

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4/9/2013

Login Sample Receipt Checklist

Client: Broadbent & Associates, Inc.

Job Number: 440-41942-1

Login Number: 41942

List Source: TestAmerica Irvine

List Number: 1

Creator: Freitag, Kevin R

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.	True	
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	Alex M/James R
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.	False	Refer to Job Narrative for details.
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:	**1Q13 GW Monitoring**
Report Type:	**Monitoring Report - Semi-Annually**
Facility Global ID:	**T06019734306**
Facility Name:	**ARCO #2107**
File Name:	**440-41942-1_09 Apr 13 1730_EDF.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**4/22/2013 1:21:38 PM**
Confirmation Number:	**2593667209**

VIEW QC REPORT

VIEW DETECTIONS REPORT

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:	**1Q13 GEO_WELL 2107**
Facility Global ID:	**T06019734306**
Facility Name:	**ARCO #2107**
File Name:	**GEO_WELL.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**67.118.40.90**
Submittal Date/Time:	**4/22/2013 1:24:27 PM**
Confirmation Number:	**7514820158**