

C A M B R I A

ENVIRONMENTAL
PROTECTION December 2, 1999

Mr. Larry Seto
Alameda County Department of
Environmental Health
UST Local Oversight Program
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

99 DEC 13 PM 4:54

STID 3749

Re: **Third Quarter 1999 Monitoring Report**
Former Arco Service Station
706 Harrison Street
Oakland, California
STID 3749
Cambria Project #230-0116-112



Dear Mr. Seto:

On behalf of Mr. Bo K. Gin, Cambria Environmental Technology, Inc. (Cambria) is submitting this third quarter 1999 groundwater monitoring report for the site referenced above. Presented below are the third quarter 1999 activities, the current hydrocarbon distribution in groundwater, recommendations, and the anticipated fourth quarter 1999 activities.

THIRD QUARTER 1999 ACTIVITIES

Quarterly Groundwater Sampling: On August 27, 1999 Cambria gauged and sampled all onsite and offsite groundwater monitoring wells. Cambria coordinated field activities with Aqua Science Engineers Inc (Aqua Science) of Danville, California, who complete quarterly monitoring for the adjacent Former Shell Service Station (upgradient site) at 726 Harrison Street. The samples from both sites were sent together to McCampbell Analytical of Pacheco, California. Table 1 summarizes groundwater elevation data and analytical results for the subject site. Figure 1 presents the groundwater elevation contours and benzene and methyl tert-butyl ether (MTBE) concentrations for both sites. Cambria's groundwater sampling laboratory analytical results are included as Attachment A, and water sampling field sheets are included as Attachment B. Included as Attachment C is Aqua Science's laboratory analytical report, groundwater elevation contour map, and groundwater elevation data table for the neighboring site.


Remediation System: The system has operated continuously since the beginning of May. Cambria is conducting monthly site visits for monitoring and operations and maintenance (O&M).

Oakland, CA
Sonoma, CA
Portland, OR
Seattle, WA

**Cambria
Environmental
Technology, Inc.**

1144 65th Street
Suite B
Oakland, CA 94608
Tel (510) 420-0700
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HYDROCARBON DISTRIBUTION IN GROUNDWATER



No measurable liquid-phase hydrocarbons (LPH) were detected in any of the site wells. Hydrocarbon concentrations remained consistent with historic data with a maximum benzene concentration of 7,400 parts per billion (ppb) in source area well MW-2 and a maximum MTBE concentration of 2,100 ppb in source area well MW-1. Downgradient wells MW-5, MW-6 and MW-7 remained below detection limits for benzene and MTBE, consistent with historical data, as did crossgradient well MW-3. The hydrocarbon plume is well defined by upgradient well MW-4, crossgradient well MW-3 and downgradient wells MW-5 and MW-6. The current benzene and MTBE distribution in groundwater for both the neighboring site and the subject site is shown on Figure 1.

The maximum MTBE concentration in groundwater beneath the upgradient neighboring site is 14,000 ppb in monitoring well MW-1, located approximately 5 feet downgradient of the extent of excavation of the former underground storage tank pit. This is one order of magnitude greater than historic concentrations for the subject site. Figure 2 shows MTBE isoconcentration contours for both sites. MTBE from the neighboring site appears to be impacting groundwater beneath the subject site.

MTBE DISCUSSION

The MTBE EPA Method 8260 analytic results from the combined sampling show that the source area for the MTBE plume emanates from 726 Harrison Street, the upgradient property. The concentration increase from MW-2 to MW-1 on the subject site is not atypical for the migration of MTBE. Therefore, Cambria does not recommend evaluating the subject site's closure candidacy based on MTBE concentrations, but rather on the TPHg/BTEX concentrations detected historically beneath the site.

ANTICIPATED FOURTH QUARTER 1999 ACTIVITIES

Quarterly Groundwater Sampling: As requested by the ACDEH, Cambria will gauge each monitoring well, measure the thickness of any detected LPH, and collect groundwater samples from selected wells. Cambria will tabulate the data and prepare a quarterly monitoring report.

Remediation System: Cambria will continue to operate the SVE system and conduct monthly visits for monitoring and O&M. However, as soon as the groundwater table rises above the vadose zone well screens, Cambria will recommend shutting down and removing the remediation system.

CLOSURE REQUEST


After shutting down the SVE system, Cambria will prepare a package summarizing the site data and petitioning ACDEH for regulatory closure.


CLOSING

We appreciate the opportunity to provide environmental services on behalf of Mr. Bo K. Gin. Please call David Elias at (510) 420-0700 if you have any questions or comments.



Sincerely,
Cambria Environmental Technology, Inc.


Jacquelyn Jones
Staff Geologist


David Elias, RG
Senior Geologist



H:\SB-2004\Oakl-116 - Bo Gin\QM\QM-3-99.WPD

- Attachments: A - Analytical Results for Groundwater Sampling
B - Water Sampling Field Sheets
C - Aqua Science Data

cc: Mr. Bo K. Gin, 288 11th Street, Oakland, CA 94706

EXPLANATION

- Monitoring Well Location
- ⊕ Dual Well, SVE/Sparging Well
- ⊙ SVE Well
- ⊛ Well Sampled by Aqua Science

14.00 — Groundwater Elevation Contour, Dashed Where Inferred

NS Not Sampled; well inaccessible

* Anomalous groundwater elevation; not used in contouring

← 0.006 Groundwater Flow Direction and Gradient (ft/ft)

Well Identification

ID	ELEV.	Benz. - Date	MTBE - Date
MW-4	14.88	4.7	1,700
MW-3	14.21	<0.5	1,800
MW-4	13.97	870	3,300
MW-2	NS	NS	NS
MW-3	13.72	7,400	1,200
MW-3	13.62	<0.5	<5.0
MW-1	13.31	5,800	1,800
MW-7	13.32	<0.5	<5.0
MW-6	13.46*	<0.5	<5.0
MW-5	12.61	<0.5	<5.0

Groundwater elevation, in feet above mean sea level (msl).
Benzene and MTBE concentrations are in parts per billion (ppb). Date is most recent sampling unless otherwise indicated.

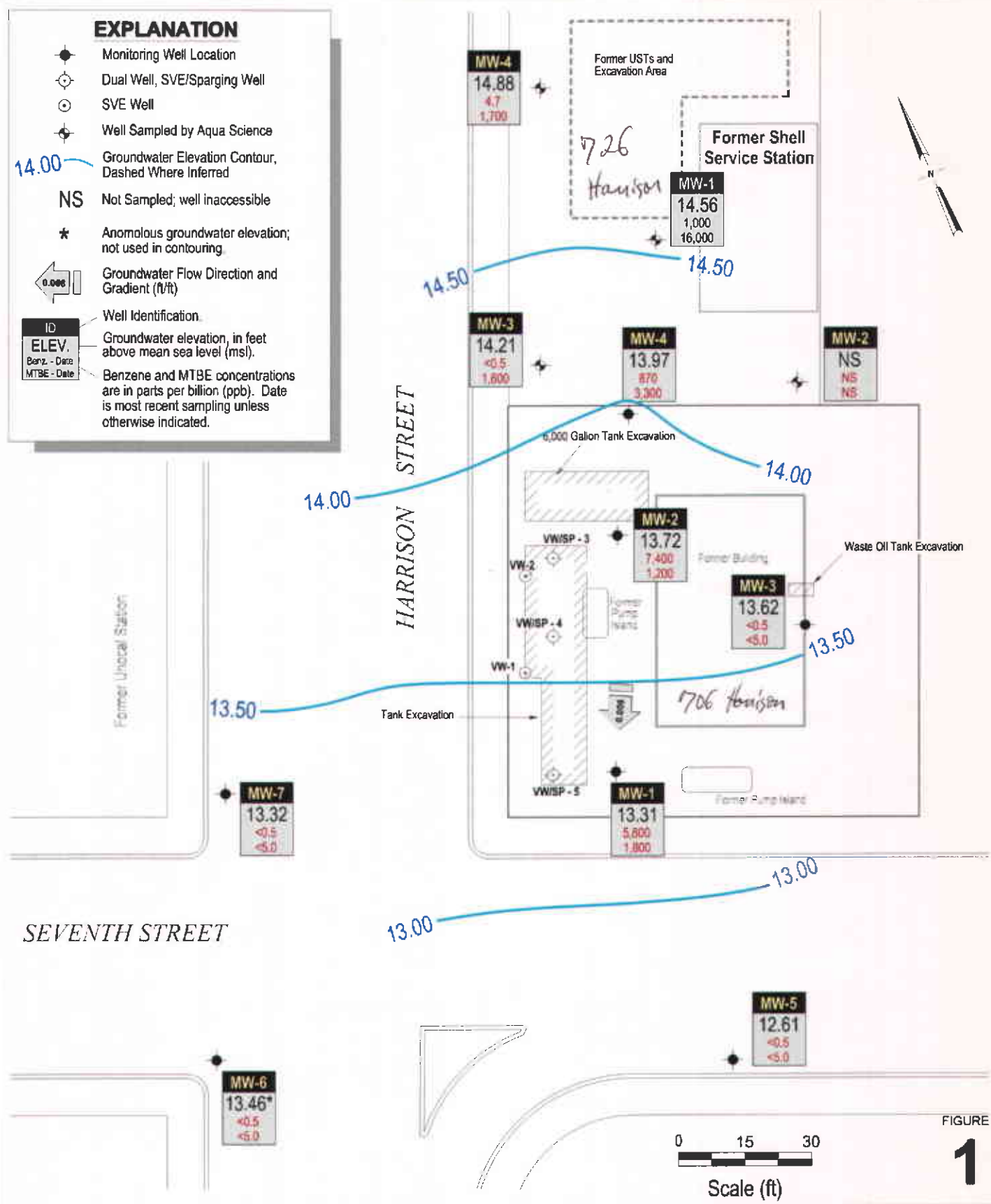


FIGURE
1

Former Arco Station

706 Harrison Street
Oakland, California



C A M B R I A

Groundwater Elevation Contour Map

August 27, 1999

M:\88-2004\CAK-1\FIGURE\GUC\GUP_AFP.dwg

EXPLANATION

- Monitoring Well Location
- ⊕ Dual Well, SVE/Sparging Well
- SVE Well
- ⊕ Well Sampled by Aqua Science

100 — MTBE concentration contour, dashed where inferred

NS Not Sampled, well inaccessible

Well ID — Well Identification.

MTBE — MTBE concentrations are in parts per billion (ppb).

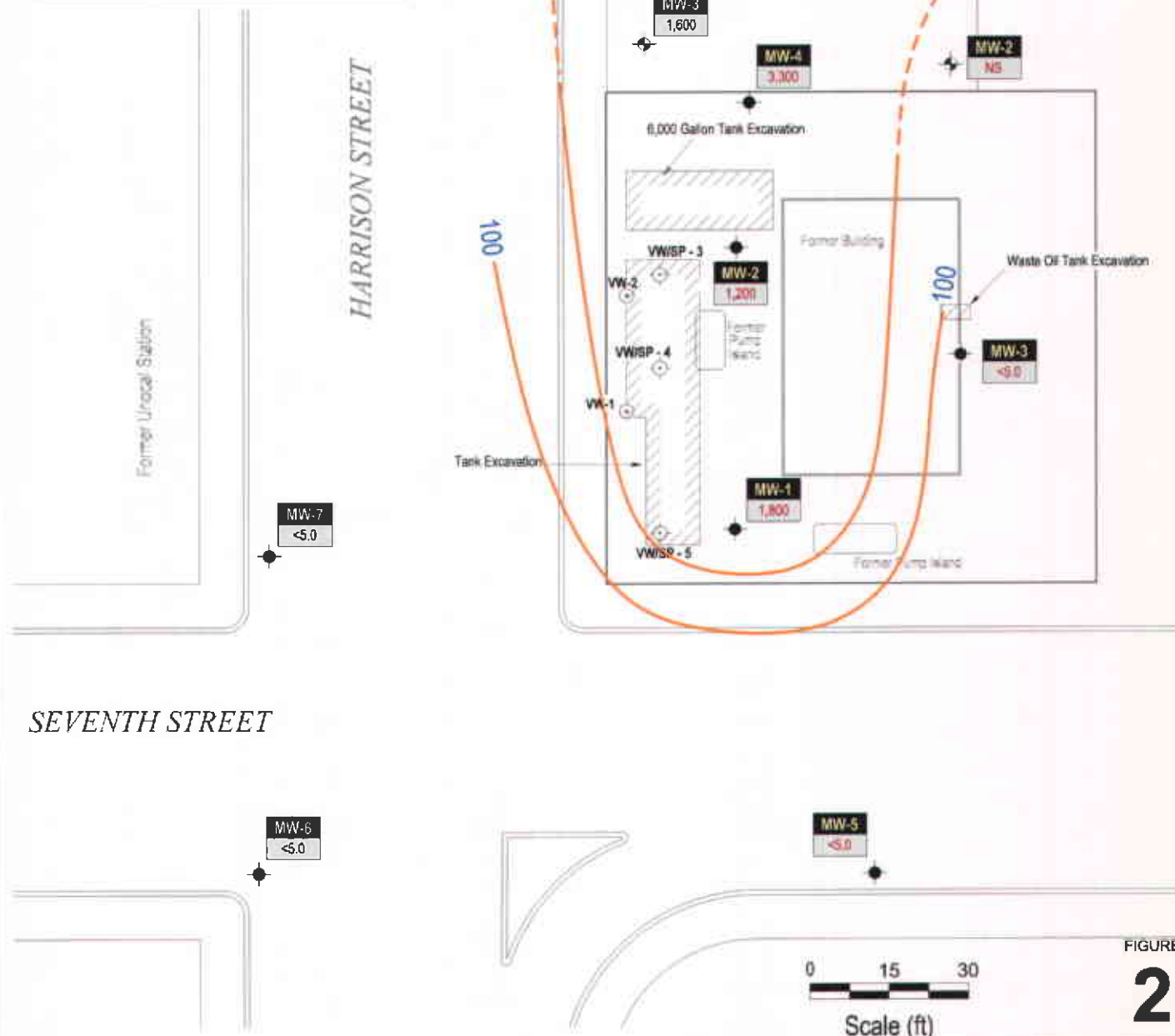


FIGURE 2

Former Arco Station

706 Harrison Street
Oakland, California



C A M B R I A

MTBE Isoconcentration Map

August 27, 1999

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CAMBRIA

Table 1. Groundwater Analytical Data - Former Arco Station - 706 Harrison Street, Oakland, California

Well ID TOC	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft)	Concentrations in parts per billion (µg/L)						Notes
				TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE ^a	
MW-1	8/13/93	17.40	11.75	20,000	8,500	640	280	440	-	
29.15	12/14/93	17.27	11.88	17,000	9,200	1,200	4,400	540	-	
	4/15/94	17.00	12.15	9,500	3,600	530	160	280	-	
	12/29/94	16.40	12.75	-	-	-	-	-	-	
	7/19/96	15.83	13.32	17,000	5,200	1,100	330	530	-	sheen/odor
	1/27/97	13.58	15.57	30,000	9,800	1,300	790	880	400	b, sheen/odor
	6/18/97	16.11	13.04	19,000	5,600	1,400	510	770	1,200 (800)	a, b
	9/18/97	16.62	12.53	48,000	18,000	4,400	1,000	1,700	<640	b
	12/10/97	15.93	13.22	22,000	4,900	1,300	580	650	460 (260)	a, b, odor
	2/18/98	11.56	17.59	16,000	5,000	750	400	780	1,800	b
	5/12/98	13.53	15.62	19,000	4,600	810	450	770	5,500	b, c
	8/18/98	15.19	13.96	12,000	3,600	1,300	300	570	5,100(3,700)	a, b
	11/24/98	15.67	13.48	13,000	3,600	890	330	380	6,100	b
	2/4/99	15.31	13.84	20,000	5,900	830	450	500	4,900	b
	5/18/99	14.95	14.20	23,000	7,000	1,600	520	830	6,100	b
	8/27/99	15.84	13.31	19,000	5,800	1,700	410	710	1,800 (2,100)	a, b
MW-2	8/13/93	17.05	13.46	34,000	6,800	10,000	740	3,900	-	
30.51	12/14/93	18.28	12.23	16,000	3,200	4,200	500	1,700	-	
	4/15/94	18.10	12.41	23,000	2,500	4,200	470	1,800	-	
	12/29/94	17.40	13.11	-	-	-	-	-	-	
	7/19/96	16.72	13.79	90,000	7,300	14,000	1,600	7,300	-	odor
	1/27/97	14.89	15.62	63,000	7,100	13,000	1,600	7,100	500	b, odor
	6/18/97	17.12	13.39	52,000	5,100	10,000	1,400	6,000	<200	b
	9/18/97	17.63	12.88	110,000	9,400	23,000	2,600	13,000	<890	b, sheen/odor

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Table 1. Groundwater Analytical Data - Former Arco Station - 706 Harrison Street, Oakland, California

Well ID TOC	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft)	Concentrations in parts per billion (µg/L)						Notes
				TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE ^a	
	12/10/97	16.98	13.53	39,000	2,600	5,300	940	3,900	780 (320)	b, odor
	2/18/98	12.61	17.90	85,000	9,000	19,000	2,300	11,000	2,400	b
	5/12/98	14.45	16.06	110,000	9,500	21,000	2,500	12,000	<1,200	b
	8/18/98	16.14	14.37	64,000	6,000	13,000	1,700	7,800	2,000(1,300)	a, b
	11/24/98	16.70	13.81	78,000	5,300	14,000	2,300	11,000	<2,000	b, g
	2/4/99	18.39	12.12	66,000	5,800	16,000	2,600	12,000	3,000	b, g
	5/18/99	15.90	14.61	78,000	6,700	17,000	2,400	10,000	4,300	b
	8/27/99	16.79	13.72	91,000	7,400	17,000	2,300	11,000	1,200 (1,000)	a, b
MW-3	8/13/93	17.05	12.72	<50	<0.50	<0.50	<0.50	<1.5	-	
29.77	12/14/93	17.70	12.07	<50	<0.50	<0.50	<0.50	<1.5	-	
	4/15/94	17.40	12.37	<50	<0.5	<0.5	<0.5	<0.5	-	
	12/29/94	16.80	12.97	-	-	-	-	-	-	
	7/19/96	16.28	13.49	<50	<0.5	<0.5	<0.5	<0.5	-	
	1/27/97	13.83	15.94	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	6/18/97	16.53	13.24	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	9/18/97	17.07	12.70	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	12/10/97	16.15	13.62	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	2/18/98	11.80	17.97	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	5/12/98	13.85	15.92	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	8/18/98	15.57	14.20	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	11/24/98	16.04	13.73	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	2/4/99	17.80	11.97	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	5/18/99	15.29	14.48	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	8/27/99	16.15	13.62	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
MW-4	12/16/94	18.10	13.08	2,500	32	6.5	4.5	17	-	

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Table 1. Groundwater Analytical Data - Former Arco Station - 706 Harrison Street, Oakland, California

Well ID 70C	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft)	Concentrations in parts per billion (µg/L)						MTBE ^a	Notes
				TPHg	Benzene	Toluene	Ethylbenzene	Xylenes			
31.18	12.29/94	17.95	13.23	-	-	-	-	-	-		
	7/19/96	17.38	13.80	3,300	520	39	67	60	-		
	1/27/97	15.25	15.93	4,500	860	55	100	91	1,100		b
	6/18/97	17.61	13.57	2,700	700	52	81	76	2,200 (2,300)		a, b
	9/18/97	18.01	13.17	3,900	760	38	56	64	<170		b
	12/10/97	17.45	13.73	12,000	1,800	120	210	210	2,900 (2,600)		a, b
	2/18/98	13.09	18.09	1,700	210	8.0	6.7	16	200		b
	5/12/98	14.78	16.40	2,100	300	15	36	34	920		b, c
	8/18/98	16.59	14.59	4,700	1,000	130	110	150	5,200(4,900)		a, b
	11/24/98	17.18	14.00	3,000	810	44	76	94	4,800		b
	2/4/99	18.90	12.28	2,800	770	50	69	69	3,100		b
	5/18/99	16.30	14.88	4,000	780	57	7.7	79	4,800		b
8/27/99	17.21	13.97	4,100	870	51	74	99	3,300 (4,100)		a, b	
MW-5	12/16/94	16.07	11.97	<50	1.1	<0.5	<0.5	2.4	-		
28.04	12/29/94	16.10	11.94	-	-	-	-	-	-		
	7/19/96	15.49	12.55	<50	<0.5	<0.5	<0.5	<0.5	-		
	1/27/97	13.60	14.44	<50	<0.5	<0.5	<0.5	<0.5	<5.0		
	6/18/97	15.55	12.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0		
	9/18/97	16.16	11.88	<50	<0.5	<0.5	<0.5	<0.5	<5.0		
	12/10/97	15.41	12.63	<50	<0.5	<0.5	<0.5	<0.5	<5.0		
	2/18/98	10.93	17.11	<50	<0.5	<0.5	<0.5	<0.5	<5.0		
	5/12/98	13.25	14.79	<50	<0.5	<0.5	<0.5	<0.5	<5.0		
	8/18/98	14.75	13.29	<50	<0.5	<0.5	<0.5	<0.5	<5.0		
	11/24/98	15.15	12.89	<50	<0.5	<0.5	<0.5	<0.5	<5.0		
	2/4/99	14.61	13.43	<50	<0.5	<0.5	<0.5	<0.5	<5.0		
	5/18/99	14.15	13.89	<50	<0.5	<0.5	<0.5	<0.5	<5.0		

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Table 1. Groundwater Analytical Data - Former Arco Station - 706 Harrison Street, Oakland, California

Well ID TOC	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft)	Concentrations in parts per billion (µg/L)						Notes
				TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE ³	
	8/27/99	15.43	12.61	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
MW-6 29.10	12/16/94	17.74	11.36	<50	<0.5	<0.5	<0.5	<0.5	-	
	12/29/94	17.40	11.70	-	-	-	-	-	-	
	7/19/96	16.60	12.50	<50	<0.5	<0.5	<0.5	<0.5	-	
	1/27/97	14.88	14.22	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	6/18/97	16.73	12.37	51	22	<0.5	<0.5	<0.5	<5.0	c
	9/18/97	17.24	11.86	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	12/10/97	16.56	12.54	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	2/18/98	12.93	16.17	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	5/12/98	14.35	14.75	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	8/18/98	15.94	13.16	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	11/24/98	16.46	12.64	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	2/4/99	18.25	10.85	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	5/18/99	15.73	13.37	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	8/27/99	15.64	13.46	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
MW-7 29.67	12/16/94	17.07	12.60	<50	<0.5	<0.5	<0.5	<0.5	-	
	12/29/94	17.65	12.02	-	-	-	-	-	-	
	7/19/96	16.44	13.23	<50	<0.5	<0.5	<0.5	<0.5	-	
	1/27/97	15.09	14.58	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	6/18/97	16.59	13.08	73	<0.5	0.55	<0.5	<0.5	<5.0	d
	9/18/97	17.06	12.61	94	<0.5	<0.5	<0.5	<0.5	<5.0	e, f
	12/10/97	16.58	13.09	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	2/18/98	12.60	17.07	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	5/12/98	14.81	14.86	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	8/18/98	15.67	14.00	<50	<0.5	<0.5	<0.5	<0.5	<5.0	

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Table 1. Groundwater Analytical Data - Former Arco Station - 706 Harrison Street, Oakland, California

Well ID TOC	Date Sampled	Depth to Water (ft)	Groundwater Elevation (ft)	Concentrations in parts per billion (µg/L)						Notes
				TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE ^a	
	11/24/98	16.30	13.37	200	<0.5	<0.5	<0.5	<0.5	<5.0	d
	2/4/99	15.99	13.68	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	5/18/99	15.42	14.25	200	<0.5	<0.5	<0.5	<0.5	<5.0	d
	8/27/99	16.35	13.32	140	<0.5	<0.5	<0.5	<0.5	<5.0 (1.5)	a, d

Abbreviations and Analyses:

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015
 Benzene, ethylbenzene, toluene and xylenes by EPA Method 8020.
 MTBE = Methyl tert-butyl ether by EPA Method 8020
 µg/L = Micrograms per liter
 TOC = Top of casing elevation with respect to mean sea level

Notes:

a = Result in parentheses indicates MTBE by EPA Method 8260.
 b = Analytical laboratory notes that unmodified or weakly modified gasoline is significant.
 c = Analytical laboratory notes that lighter gasoline range compounds are significant.
 d = Analytical laboratory notes that isolated peaks are present.
 e = Analytical laboratory notes that heavier gasoline range compounds are significant.
 f = Analytical laboratory notes hydrocarbons with no recognizable patterns are present.
 g = Analytical laboratory notes lighter than water immiscible sheen is present.
 Data prior to 12/16/94 provided by previous consultant.

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ATTACHMENT A

Analytical Results for Groundwater Sampling



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
 Telephone : 925-798-1620 Fax : 925-798-1622
<http://www.mccampbell.com> E-mail: main@mccampbell.com

Cambria Environmental Technology 1144 65 th Street, Suite C Oakland, CA 94608	Client Project ID: #230-0116; Bo Gin	Date Sampled: 08/27/99
	Client Contact: Jacquelyn Jones	Date Received: 08/27/99
	Client P.O:	Date Extracted: 08/28-09/07/99
		Date Analyzed: 08/28-09/07/99

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*


EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) ⁺	MTBE	Benzene	Toluene	Ethylben- zene	Xylenes	% Recovery Surrogate
18134	MW-1	W	19,000,a	1800	5800	1700	410	710	106
18135	MW-2	W	91,000,a	1200	7400	17,000	2300	11,000	101
18136	MW-3	W	ND	ND	ND	ND	ND	ND	92
18137	MW-4	W	4100,a	3300	870	51	74	99	111
18138	MW-5	W	ND	ND	ND	ND	ND	ND	96
18139	MW-6	W	ND	ND	ND	ND	ND	ND	96
18140	MW-7	W	140,f	ND	ND	ND	ND	ND	--- [#]
18141	Trip Blank	W	ND	ND	ND	ND	ND	ND	96
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

cluttered chromatogram; sample peak coelutes with surrogate peak

*The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

 Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
<http://www.mccampbell.com> E-mail: main@mccampbell.com

Cambria Environmental Technology 1144 65 th Street, Suite C Oakland, CA 94608	Client Project ID: #230-0116; Bo Gin	Date Sampled: 08/27/99
	Client Contact: Jacquelyn Jones	Date Received: 08/27/99
	Client P.O:	Date Extracted: 09/01-09/03/99
		Date Analyzed: 09/01-09/03/99

Methyl tert-Butyl Ether *

EPA method 8260 modified

Lab ID	Client ID	Matrix	MTBE*	% Recovery Surrogate
18134	MW-1	W	2100	113
18135	MW-2	W	1000	109
18137	MW-4	W	4100	114
18140	MW-7	W	1.5	118
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W	1.0 ug/L		
	S	5.0 ug/kg		

* water samples are reported in ug/L, soil and sludge samples in ug/kg, wipe samples in ug/wipe and all TCLP / STLC / SPLP extracts in ug/L
h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

QC REPORT FOR HYDROCARBON ANALYSES

Date: 08/27/99-08/28/99

Matrix: WATER

Analyte	Concentration (ug/L)			Amount Spiked	% Recovery		
	Sample (#17000)	MS	MSD		MS	MSD	RPD
TPH (gas)	0.0	100.0	97.9	100.0	100.0	97.9	2.1
Benzene	0.0	9.2	9.2	10.0	92.0	92.0	0.0
Toluene	0.0	9.1	9.1	10.0	91.0	91.0	0.0
Ethyl Benzene	0.0	9.3	9.2	10.0	93.0	92.0	1.1
Xylenes	0.0	27.8	27.5	30.0	92.7	91.7	1.1
TPH(diesel)	0.0	8564	8457	7500	114	113	1.3
TRPH (oil & grease)	0	19400	19100	23700	82	81	1.6

* Rec. = (MS - Sample) / amount spiked x 100

RPD = ((MS - MSD) / (MS + MSD)) x 2 x 100

McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553
 Tele: 925-798-1620 Fax: 925-798-1622

QC REPORT FOR VOCs (EPA 8240/8260)

Date: 09/01/99-09/02/99

Matrix: WATER

Analyte	Concentration (ug/kg, u Sample (#18613)			Amount Spiked	% Recovery		RPD
	MS	MSD			MS	MSD	
1,1-Dichloroethene	0	97	101	100	97	101	4.0
Trichloroethene	0	87	115	100	87	115	27.7
EDB	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chlorobenzene	0	106	120	100	106	120	12.4
Benzene	0	102	115	100	102	115	12.0
Toluene	0	103	123	100	103	123	17.7

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

16515 ZC 58

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553

Telephone: (925) 798-1620

Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME

RUSH 24 HOUR 48 HOUR 5 DAY

Report To: Jacquelyn Jones Bill To: Cambria
Company: Cambria Environmental Technology
1144 65th Street, Suite C
Oakland, CA 94608
Tele: (510) 420-0700 Fax: (510) 420-9170
Project #: 230-0116 Project Name: Bo Gin
Project Location: 706 Harrison Street Oakland CA
Sampler Signature: [Signature]

Analysis Request

Other

Comments

SAMPLE ID	LOCATION	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED				BTEX & TPH as Gas (602/8020 + 8015) / MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Other	Comments				
		Date	Time			Water	Soil	Air	Sludge	Other	Ice	HCl	HNO ₃	Other																					
+ MW1		8/27/99	1253	4	VOAS	X					X	X																							18134
+ MW2			105																																18135
+ MW3			1235																																18136
+ MW4			1245																																18137
+ MWS			1015																																18138
+ MW6			1040																																18139
+ MW7		✓	1110																																18140
✓ Trip Blank		-	-	1	WA																														18141

MTBE confirmation by 8240 on hiB only

Relinquished By: [Signature] Date: 8/27/99 Time: 1207M Received By: [Signature]
Relinquished By: [Signature] Date: 8/27/99 Time: 1400 Received By: [Signature]
Relinquished By: [Signature] Date: 8/27/99 Time: 1555 Received By: [Signature]

Remarks:
ICE GOOD CONDITION HEAD SPACE ABSENT PRESERVATION APPROPRIATE CONTAINERS
VOAS O&G METALS OTHER

C A M B R I A



ATTACHMENT B
Water Sampling Field Sheets

Bo 6214

230-0116

WELL DEPTH MEASUREMENTS

Well ID	Time	Product Depth	Water Depth	Product Thickness	Well Depth	Comments
MW 5	955	—	15.43	—	28.13	
MW 6	1020	—	15.64	—	26.10	
MW-7	1029	—	16.35		28.80	
MW-1	1040	—	15.84		25.82	
MW-2	1043	—	16.79		25.55	
MW-3	1046	—	16.15		27.77	
MW-4	1048	—	17.21		29.12	

Measured By: JJ/SR

Date: 8/27/99

WELL SAMPLING FORM

Project Name: Bo Gin	Cambria Mgr: DCE	Well ID: MW1
Project Number: 230-0116	Date: 8/27/99	Well Yield: ---
Site Address: 706 Harrison Street Oakland, California	Sampling Method:	Well Diameter: 2 " pvc
	Disposable bailer	Technician(s): JR
Initial Depth to Water: 15.84'	Total Well Depth: 25.82'	Water Column Height: 9.98
Volume/ft: 0.16	1 Casing Volume: 1.60 gal	3 Casing Volumes: 4.80 gal
Purging Device: sub pump disposable bailer	Did Well Dewater?: NO	Total Gallons Purged: 5 gal
Start Purge Time: 1201	Stop Purge Time: 1205	Total Time: 4 min

1 Casing Volume = Water column height x Volume/ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. °C	pH	Cond. <u>uS</u>	Comments
1201	1	19.7	6.5	897	
1203	2	19.5	6.4	889	
1205	3	19.5	6.4	848	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW1	8/27/99	1253	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015

WELL SAMPLING FORM

Project Name: Bo Gin	Cambria Mgr: DCE	Well ID: MW-2
Project Number: 230-0116	Date: 8/27/99	Well Yield: —
Site Address: 706 Harrison Street Oakland, California	Sampling Method: Disposable bailer	Well Diameter: 2 " pvc
		Technician(s): JR
Initial Depth to Water: 16.79'	Total Well Depth: 25.55'	Water Column Height: 8.76'
Volume/ft: 0.16	1 Casing Volume: 1.40 gal	3 Casing Volumes: 4.20 gal
Purging Device: sub pump disposable bailer	Did Well Dewater?: NO	Total Gallons Purged: 5 gal
Start Purge Time: 1213	Stop Purge Time: 1217	Total Time: 4 min

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. °C	pH	Cond. μS	Comments
1213	1	20.7	6.5	602	
1215	2	20.6	6.4	570	
1217	3	20.6	6.4	525	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW2	8/27/99	105	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015

WELL SAMPLING FORM

Project Name: Bo Gin	Cambria Mgr: DCE	Well ID: MW3
Project Number: 230-0116	Date: 8/27/99	Well Yield: ---
Site Address: 706 Harrison Street Oakland, California	Sampling Method: Disposable bailer	Well Diameter: 2 " pvc
		Technician(s): JR/RR
Initial Depth to Water: 16.15'	Total Well Depth: 27.77'	Water Column Height: 11.62'
Volume/ft: 0.16	1 Casing Volume: 1.86 gal	3 Casing Volumes: 5.58 gal
Purging Device: ^{sub pump} disposable bailer	Did Well Dewater?: no	Total Gallons Purged: 6 gal
Start Purge Time: 1034	Stop Purge Time: 1039	Total Time: 5 min

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. °C	pH	Cond. μS	Comments
1034	1	19.6	7.5	343	
1037	2	19.5	6.9	510	
1038	2	19.4	6.9	540	
1039	3	19.4	6.9	534	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW3	8/27/99	1235	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015

WELL SAMPLING FORM

Project Name: Bo Gin	Cambria Mgr: DCE	Well ID: MW4
Project Number: 230-0116	Date: 8/27/99	Well Yield: ---
Site Address: 706 Harrison Street Oakland, California	Sampling Method: Disposable bailer	Well Diameter: 2 " pvc
		Technician(s): JR/82
Initial Depth to Water: 17.21'	Total Well Depth: 29.12'	Water Column Height: 11.91'
Volume/ft: 0.16	1 Casing Volume: 1.91 gal	3 Casing Volumes: 5.73 gal
Purging Device: sub pump disposable bailer	Did Well Dewater?: NO	Total Gallons Purged: 6 gal
Start Purge Time: 1147	Stop Purge Time: 1154	Total Time: 7min

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. °C	pH	Cond. μS	Comments
1147	1	19.8	6.5	312	
1149	2	19.6	6.4	624	
1152	3	19.6	6.4	615	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW4	8/27/99	1245	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015

WELL SAMPLING FORM

Project Name: Bo Gin	Cambria Mgr: DCE	Well ID: MWS
Project Number: 230-0116	Date: 8/27/99	Well Yield: ---
Site Address: 706 Harrison Street Oakland, California	Sampling Method: Disposable bailer	Well Diameter: 2 " pvc
		Technician(s): JR
Initial Depth to Water: 15.43	Total Well Depth: 28.13	Water Column Height: 12.70
Volume/ft: 0.16	1 Casing Volume: 2.03	3 Casing Volumes: 6.10 gal
Purging Device: disposable bailer	Did Well Dewater?: NO	Total Gallons Purged: 6.5 gals
Start Purge Time: 959	Stop Purge Time: 1010	Total Time: 11 min

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. °C	pH	Cond. μS	Comments
959	1	20.4	7.8	760	
1004	2	19.5	7.9	171	
1008	2	19.8	7.3	750	
1010	3	19.6	7.1	186	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
HIS MWS	8/27/99	1015	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015

WELL SAMPLING FORM

Project Name: Bo Gin	Cambria Mgr: DCE	Well ID: MW6
Project Number: 230-0116	Date: 8/27/99	Well Yield: —
Site Address: 706 Harrison Street Oakland, California	Sampling Method:	Well Diameter: 2 " pvc
	Disposable bailer	Technician(s): JR
Initial Depth to Water: 15.64'	Total Well Depth: 26.10'	Water Column Height: 10.46'
Volume/ft: 0.16	1 Casing Volume: 1.67 gal	3 Casing Volumes: 5.02 gal
Purging Device: disposable bailer	Did Well Dewater?: NO	Total Gallons Purged: 5.5 gal
Start Purge Time: 1023	Stop Purge Time: 1031	Total Time: 8 min

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. °C	pH	Cond. μS	Comments
1023	1	20.6	7.4	415	
1027	2	20.5	7.1	597	
1030	3	20.4	7.0	647	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW6	8/27/99	1040	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015

WELL SAMPLING FORM

Project Name: Bo Gin	Cambria Mgr: DCE	Well ID: MW7
Project Number: 230-0116	Date: 8/27/99	Well Yield: ---
Site Address: 706 Harrison Street Oakland, California	Sampling Method: Disposable bailer	Well Diameter: 2 " pvc
		Technician(s): JR/JR
Initial Depth to Water: 16.35	Total Well Depth: 28.80	Water Column Height: 12.45
Volume/ft: 0.16	1 Casing Volume: 1.99	3 Casing Volumes: 6 gal
Purging Device: disposable bailer	Did Well Dewater?: no	Total Gallons Purged: 6 gal
Start Purge Time: 1049	Stop Purge Time: 1059	Total Time: 10 min

1 Casing Volume = Water column height x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16
4"	0.65
6"	1.47

Time	Casing Volume	Temp. °C	pH	Cond. μS	Comments
1049	1	20.6	7.1	991	
1053	2	20.7	6.9	975	
1059	3	20.8	6.8	929	

Sample ID	Date	Time	Container Type	Preservative	Analytes	Analytic Method
MW7	8/27/99	1110	4 voa's	HCL	TPHg, BTEX, MTBE	8020 8015

C A M B R I A



ATTACHMENT C
Aqua Science Data



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
 Telephone: 925-798-1620 Fax: 925-798-1622
<http://www.mccampbell.com> E-mail: main@mccampbell.com

Aqua Science Engineers, Inc 2411 Old Crow Canyon Rd, #4 San Ramon, CA 94583	Client Project ID: #3412; Chan, Former Shell Station	Date Sampled: 08/27/99
	Client Contact: Ian T. Reed	Date Received: 08/27/99
	Client P.O:	Date Extracted: 08/27-09/03/99
		Date Analyzed: 08/27-09/03/99

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*
 EPA methods 5030, modified 801.5, and 8020 or 602; California RWQCB (SF Bay Region) method UCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) ^a	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Recovery Surrogate
18142	MW-1	W	6000,a	14,000	1000	97	190	230	108
18143	MW-3	W	230,j	1500	ND	0.51	ND	1.0	119
18144	MW-4	W	440,s	1600	4.7	1.1	0.58	1.3	108
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W	50 ug/L	5.0	0.5	0.5	0.5	0.5	0.5	
	S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	0.005	


* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L.

^a clustered chromatogram; sample peak overlaps with surrogate peak

The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant (aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~4 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

 McCAMPBELL ANALYTICAL INC.	110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622 http://www.mccampbell.com E-mail: main@mccampbell.com
	(Additional contact information or address lines)

Aqua Science Engineers, Inc 2411 Old Crow Canyon Rd, #4 San Ramon, CA 94583	Client Project ID: #3412, Chan, Former Shell Station	Date Sampled: 08/27/99
	Client Contact: Ian T. Reed	Date Received: 08/27/99
	Client P.O:	Date Extracted: 09/01/99
		Date Analyzed: 09/01/99

Methyl tert-Butyl Ether *

EPA method 8260 modified

Lab ID	Client ID	Matrix	MTBE*	% Recovery Surrogate
18142	MW-1	W	16,000	118
18143	MW-3	W	1600	118
18144	MW-4	W	1700	118
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	1.0 ug/L	
		S	5.0 ug/kg	

* water samples are reported (n) ug/L, soil and sludge samples (n) ug/kg, wipe samples in ug/wipe and all TCLP / STLC / SPLP extracts (n) ug/L
 h) lighter than water (miscible shown is present); i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

 Edward Hamilton, Lab Director

10510 ZASE 1

Aqua Science Engineers, Inc.
208 W. El Pintado Road
Danville, CA 94526
(925) 820-8391
FAX (925) 837-4853

Chain of Custody

PAGE 1 OF 1

SAMPLER (SIGNATURE) Lat Read (PHONE NO.) (925) 820-8391

PROJECT NAME CHAN, Former Silver Station JOB NO. 3412
ADDRESS 726 Harrison Street, Ukiah, CA DATE 8-27-94

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 8030/8015-8020)	TPH-GASOLINE (EPA 5030/8015)	TPH-DIESEL (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	PURGEABLE AROMATICS (EPA 602/8020)	VOLATILE ORGANICS (EPA 624/8240)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520)	LIGHT METALS (5) (EPA 6010-7000)	CAM 17 METALS (EPA 6010-7000)	PCPB & PESTICIDES (EPA 608/6080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140) (EPA 608/6080)	ORGANOCHLORINE HERBICIDES (EPA 8150)	FUEL OXYGENATES (EPA 8260)	MTBE USE ONLY EPA 8260 only 8/1/94	COMPOSITE	
																					OTHER
12 AL-1	8-27-94	1655	water	3	X																
12 ML-3	↓	1010	↓	3	X															X	18142
12 ML-4	↓	1050	↓	3	X															X	18143
																				X	18144
					VEAS / ORGANOMETALS OTHER																
GOOD CONDITION					PRESERVATION																
HEADSPACE ABSENT					APPROPRIATE CONTAINERS																

RELINQUISHED BY:
Lat Read 1400
(signature) (time)
ica T Read 8-27-94
(printed name) (date)
Company ASE

RECEIVED BY:
James Green et al
(signature) (time)
James Green et al
(printed name) (date)
Company

RELINQUISHED BY:
James Green et al
(signature) (time)
James Green et al
(printed name) (date)
Company

RECEIVED BY LABORATORY:
Gina Butler
(signature) (time)
Gina Butler
(printed name) (date)
Company

COMMENTS:
5-day TAT



NORTH

SCALE
1" = 30'

8TH STREET

Unocal
MW-7

Unocal
MW-8

HARRISON STREET

CHAN AUTO

MW-4
(14.88')

FORMER
USTS &
OVEREXCAVATION
BOUNDARY

14.75

MW-1
(14.56')

14.50

Estimated
Groundwater
Flow Direction

BUILDING

MW-3
(14.21')

14.25

MW-2

ARCO
MW-4

ARCO
MW-2

FORMER
USTS/
OVEREXCAVATION

ARCO
MW-3

FORMER
ARCO
SERVICE
STATION

ARCO
MW-1

SIDEWALK

ARCO
MW-7

MW-1 **LEGEND**

ASE Monitoring Well

(14.69') Groundwater elevation,
relative to MSL

Groundwater elevation contour

7TH STREET

GROUNDWATER ELEVATION
CONTOUR MAP - 8/27/00

726 HARRISON STREET
OAKLAND, CALIFORNIA

AQUA SCIENCE ENGINEERS

Figure 2