

LOP 469 File

CAMBRIA

**Fax**

To:	Ms. Susan Hugo
Organization:	ACHCSA
Fax:	(510) 337-9335
Phone:	(510) 567-6780
From:	Bob Schultz
Phone:	(510) 420-3341
Pages (Incl. cover):	
Date:	March 30, 2000
Re:	Connell Auto Dealership

Dear Ms. Hugo:

Please find Cambria's report summarizing the potential receptor and preferential pathway surveys performed at Connell Automobile Dealership, 3093 Broadway, Oakland, CA. I look forward to meeting with you on Monday.

Thank you,

Bob Schultz
Project Geologist

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Cambria Environmental Technology, Inc. 1144 65th Street Suite B Oakland CA 94608 Tel (510) 420-0700 Fax (510) 420-9170

C A M B R I A

ENVIRONMENTAL
PROTECTION

March 30, 2000

Ms. Susan Hugo
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

00 MAR 34 PM 3:17

Re: **Potential Receptor and
Preferential Pathway Survey Report**
Connell Automobile Dealership
3093 Broadway
Oakland, California
StID #469

LOP 469



Dear Ms. Hugo:

On behalf of Messrs. George Hill and Gordon Linden and as required by the Alameda County Health Care Services Agency (ACHCSA), Cambria Environmental Technology, Inc. (Cambria) has prepared this potential receptor and preferential pathway survey report for the above-referenced site. This report was prepared as described in the ACHCSA-approved April 15, 1999 *Work Plan* prepared by Subsurface Consultants, Inc. The site background, potential receptor survey procedures and results, preferential pathway survey procedures and results, and Cambria's conclusions are presented below.

SITE BACKGROUND

Three underground storage tanks (USTs) which previously contained gasoline, diesel, and waste oil were removed from the subject site in December 1989. Soil and groundwater investigation has been ongoing since 1990. Between October 1996 and March 1998 operation of a soil vapor extraction (SVE) remediation system removed approximately 1,421 lbs of hydrocarbons. Manual removal of hydrocarbons from site monitoring wells has been ongoing since 1991.

POTENTIAL RECEPTOR SURVEY

Cambria conducted a survey to identify any water-producing wells within 2,000 ft of the site, to assess the potential for conduits to exist between the shallow and deeper water-bearing zones, and to identify surface water bodies in the site vicinity.

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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Well Documentation Review

Cambria reviewed Alameda County Public Works Agency (ACPWA) data for permitted wells and borings in the area. The ACPWA data indicate that twenty-nine wells/borings are located near the site (Table 1). Twenty of the 29 wells/borings identified by the ACPWA are located within 2,000 ft of the subject site. Three of the 29 wells/borings are non-monitoring wells; these wells are cathodic protection wells owned by Pacific Gas & Electric Co. (PG&E). The locations of the cathodic protection wells are shown on Figure 1. No domestic or municipal supply wells were identified within 2,000 ft of the site.



Surface Water Bodies

Cambria reviewed the USGS topographic maps for the site vicinity and conducted a site reconnaissance visit to identify surface water bodies in the site vicinity. Former Glen Echo Creek, an ephemeral water body that is fully contained by concrete culverts or concrete channels in the area surrounding the site, is located approximately 1,000 ft east of the subject site (Figure 1). Lake Merritt, a tidally-influenced, dredged estuary that connects to San Francisco Bay, is located approximately 3,700 ft south of the subject site.

PREFERENTIAL PATHWAY SURVEY

As described in the April 15, 1999 *Work Plan*, Cambria researched the potential presence of subsurface contaminant migration pathways beneath the site. Cambria investigated the potential presence of anthropogenic and hydrogeologic pathways.


Utility Conduits

To identify the locations of underground utility conduits adjacent to the site, Cambria reviewed the City of Oakland utility maps, marked Hawthorne Street (adjacent to the former UST location) for Underground Service Alert (USA), and conducted a site reconnaissance visit to map utilities identified by USA and site utility laterals.

Storm drains and sanitary sewers adjacent to the site parallel Hawthorne Street and Broadway at depths of approximately 8 and 10 ft below ground surface (bgs), respectively. Electrical, water, telephone, and cable television utility conduits also parallel Hawthorne Street and Broadway; the depth of these utilities is estimated at less than 5 ft bgs. Figure 2 presents the locations and flow directions of storm drains and sanitary sewers for the area surrounding the site. Also presented on Figure 2 are the locations of other shallow utilities in Hawthorne Street and Broadway.

Historical Geologic Map Review

To investigate the potential presence of higher permeability hydrogeologic units underlying the site, Cambria reviewed the following geological/hydrological maps:

- 
- Keith L. Knudsen, Jay S. Noller, Janet M. Sowers and William R. Lettis. Quaternary Geologic Map of the San Francisco Bay Area. in USGS Open File Report 97-715, Quaternary Geology and Liquefaction Susceptibility, San Francisco, California. 1999.
 - Geologic Map of the Flatland Deposits of the Southern Part of the San Francisco Bay Region. in USGS Professional Paper 943, Plate 3, Flatland deposits of the San Francisco Bay Region, California - their geology and engineering properties, and their importance to comprehensive planning. 1973.
 - Wagner, D.L., Bortugno, E.J., and McJunkin, R.D. Geologic Map of the San Francisco-San Jose Quadrangle, California, 1:250:000. Map No. 5a (Geology). California Division of Mines and Geology. 1991.
 - Sowers, Janet M. of William Lettis & Associates, Inc. Creek and Watershed Map of Oakland and Berkeley. Oakland Museum. 1995.

No former creeks or drainages were identified in the site vicinity. The site is located on a hillslope approximately 1,000 ft west of former Glen Echo Creek.

CONCLUSIONS

The existing network of monitoring wells adequately defines the peripheral extent of the groundwater contaminant plumes. Sensitive receptors do not appear to be at risk and it is highly unlikely that contaminant migration via preferential pathways is occurring.

Sensitive Receptors: The three PG&E cathodic protection wells identified in Figure 1 are not at risk of being impacted by contaminants originating at the subject site. Monitoring well MW-13, located downgradient of the subject site adequately defines the downgradient extent of the contaminant plumes. MW-13 is also located approximately 200 ft upgradient of the closest surface water body, former Glen Echo Creek. The former creek, now completely contained by a concrete channel, is not at risk of being impacted by the site contaminant plumes.

Preferential Pathways: The depth-to-groundwater in site monitoring wells has ranged from 16 to 34 ft since site groundwater monitoring began in 1991 (Table 2). In source area monitoring wells MW-1, MW-14, and MW-15, depth-to-groundwater has ranged from 20 to 28 ft. The depth-to-

groundwater in well MW-6 (impacted by separate phase hydrocarbons) has ranged from 23 to 29 ft. The maximum depth of utility conduits in the site vicinity is approximately 10 ft bgs. Since the groundwater table is usually 14 ft or greater below the utility conduits (the historical minimum distance between the utility conduits and the groundwater table was approximately 6 ft), it is highly unlikely that site releases are migrating via potentially higher permeability utility trench backfill. Also, it is also highly unlikely that hydrogeologic pathways, such as channel deposits, are present beneath the site.

CLOSING

If you have any questions or comments concerning this report, please call Bob Schultz at (510) 420-3341.

Sincerely,
Cambria Environmental Technology, Inc.

Robert W. Schultz

Robert W. Schultz
 Project Geologist

Bob Clark-Riddell

Bob Clark-Riddell, P.E.
 Principal Engineer



- Figures: 1 - Area Well Survey
 2 - Utility Conduit Locations

- Tables: 1 - Well Survey Summary
 2 - Groundwater Elevation and Analytical Data

cc: George Hill, 305 Sheridan Ave., Piedmont, CA 94611
 Gordon Linden, 101 Gleneden Ave., Oakland, CA 94611
 Paul Kibel, Fitzgerald, Abbott & Beardsley, LLP, 1221 Broadway, 21st Floor, Oakland, CA 94612

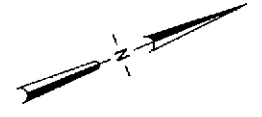


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Connell Automobile Dealership
 3093 Broadway
 Oakland, California



Area Well Survey
 (1/2-Mile Radius)



EXPLANATION	
	Glen Echo Creek Culvert
	Storm Drain
	Sanitary Sewer
	Shallow Utility Conduit
	Flow Direction
	Manholes
	Drain Inlet

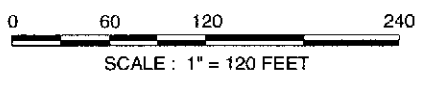
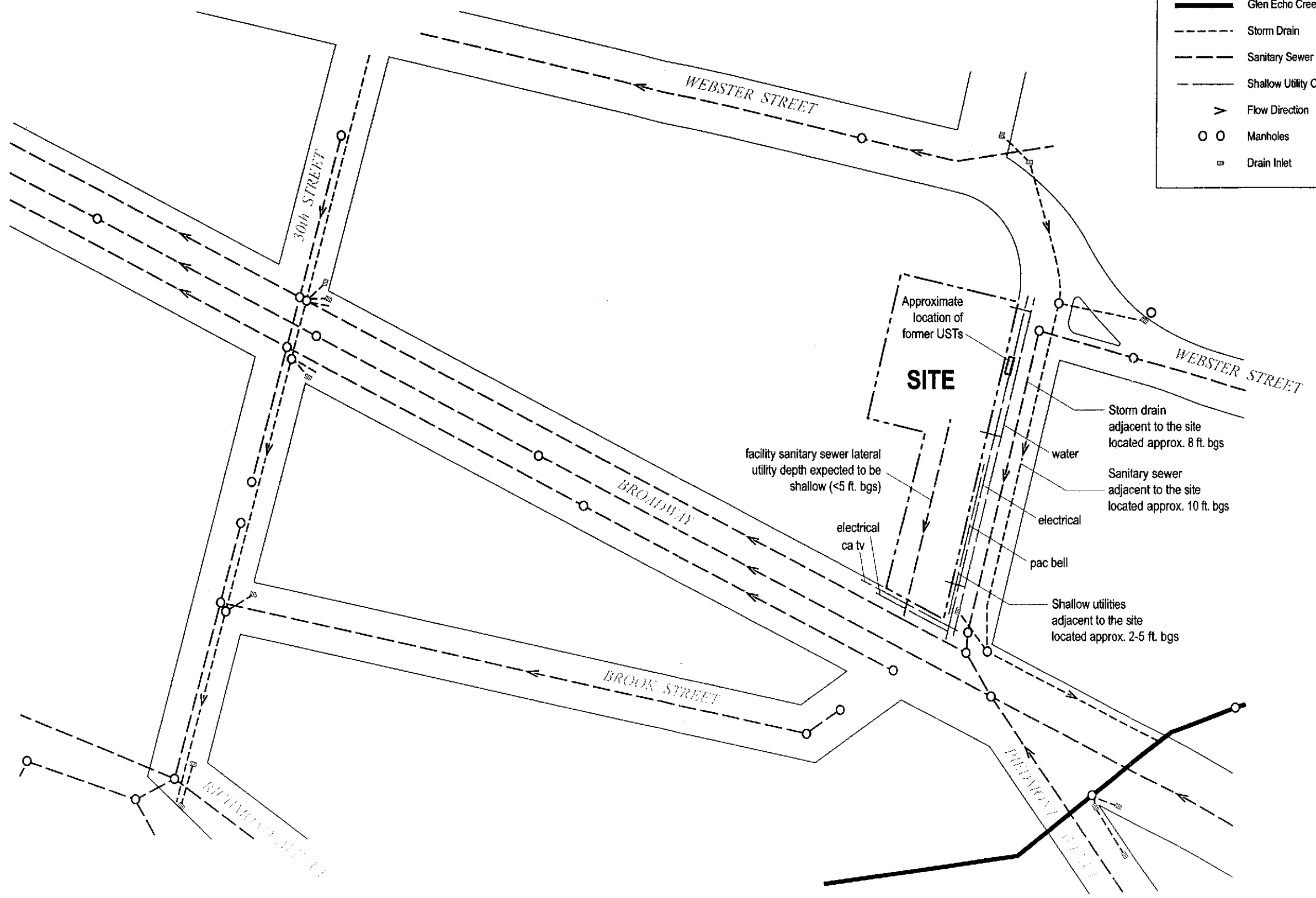


FIGURE
2

Utility Conduit Locations



C A M B R I A

Connell Automobile Dealership

3093 Broadway
Oakland, California

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Table 1. Well Survey Summary - Connell Automobile Dealership, 3093 Broadway, Oakland

Township, Range, and Section	Installation Date	Owner	Use	Total Depth (ft)	Well Location	Distance from site (ft)	Map
1S/4W 25D	Oct-92	Connell Oldsmobile	BOR	35	3093 Broadway	252	NM
1S/4W 25D 5	Oct-92	Connell Oldsmobile (B-13)	BOR	40	3093 Broadway	252	NM
1S/4W 23R 2	Apr-74	Merritt Hospital	GEO	345	Hawthorne Ave.	480	NM
1S/4W 23R 1	Mar-75	Merritt Hospital	GEO*	0	Hawthorne Ave.	480	NM
1S/4W 23R	May-89	Paul Faberman & Co.	BOR	24	3300 Webster St.	681	NM
1S/4W 23R	May-89	Paul Faberman & Co.	BOR	24	3300 Webster St.	681	NM
1S/4W 24N 7	Nov-90	Kaiser Foundation	BOR*	14	3505 Broadway	883	NM
1S/4W 24N15	Jan-92	Kaiser Health Fdn (LF-1)	DES	29	3505 Broadway	883	NM
1S/4W 24N16	Jan-92	Kaiser Health Fdn (LF-5)	DES	28	3505 Broadway	883	NM
1S/4W 24P	Jul-88	Shell Service Station	BOR	18	230 MacArthur Boulevard	1539	NM
1S/4W 24P	Aug-89	Shell Oil Company	BOR*	13	230 MacArthur Blvd	1539	NM
1S/4W 24N12	Dec-90	Kaiser Hospital	BOR	52	280 W. MacArthur	1560	NM
1S/4W 24N13	Feb-91	Kaiser Hospital	PIE	35	280 W. MacArthur	1560	NM
1S/4W 26A 1	?	Peralta Hospital	GEO*	0	450 30th	1593	NM
1S/4W 26H 1	?	Chrstn church home bldg	GEO*	0	28 & Valdez St.	1628	NM
1S/4W 24N 2	Jun-91	Chevron, USA	DES	0	3701 Broadway	1646	NM
1S/4W 26H14	Aug-91	Alan Rudy (B-2)	BOR	10	2827 Webster St.	1681	NM
1S/4W 26H	Aug-91	Alan Rudy (B-1)	BOR*	10	2827 Webster	1683	NM
1S/4W 25C 3	?	Five City Center	?	0	Crn of Clay & 14th St.	1825	NM
1S/4W 23R	Jun-88	Merritt Peralta Institute	BOR	30	34th & Elm Sts.	1892	NM
1S/4W 26H	Sep-92	MR & RB Assoc.	BOR	20	294 27th St.	2177	NM
1S/4W 26B 1	Apr-74	PG&E	CAT	0	29 & Telegraph St.	2183	M
1S/4W 24Q 1	Jun-74	PG&E	CAT	120	Moutell St.	2392	M
1S/4W 26G12	Apr-93	Shell Oil (S-2)	DES	29	2800 Telegraph Ave.	2463	NM
1S/4W 24P	Apr-86	Gettler-Ryan (Shell)	BOR	20	230 MacArthur Blvd	2502	NM

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Table 1. Well Survey Summary - Connell Automobile Dealership, 3093 Broadway, Oakland

Township, Range, and Section	Installation Date	Owner	Use	Total Depth (ft)	Well Location	Distance from site (ft)	Map
1S/4W 25L80	Aug-74	PG&E	CAT	120	Adams & Lee St.	2642	M
1S/4W 24L 7	Oct-90	Unocal Corporation	TES	55	3943 Broadway	2658	NM
1S/4W 24L20	Jun-92	Unocal Corp (RW1)	BOR	18	3943 Broadway	2659	NM
1S/4W 24L	Jul-92	Erma Delluchi	BOR	25	14 Glen Ave.	2993	NM

Abbreviations:

BOR = boring (may be geotechnical) GEO = boring (may be geotechnical or geoprobe boring)
CAT = Cathodic protection well M = Well location shown on map
DES = Destroyed Well NM = Not mapped, well is not a potential sensitive receptor
PJE = Piezometer * = unspecified note added by ACPWA
TES = Test Well
? = information not available

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Table 2. Groundwater Elevation and Analytical Data: Volatile Hydrocarbons and HVOCs

Connell Automobile Dealership, 3093 Broadway, Oakland, California

Well ID TOC Elev. (ft)	Sampling Date	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TVH	TPHg	Benzene	Toluene	Ethyl -		MTBE	1,2-DCA	Other HVOCs
								benzene	Xylenes			
-----> ug/l <-----												
MW-1	10/5/90	26.40	68.08	620,000	--	33,000	50,000	7,900	41,000	--	2,900	ND
94.48	3/1/91	27.46	67.02	FP	--	--	--	--	--	**	--	--
	10/12/92	26.44	68.04	490,000	--	51,000	59,000	5,000	27,000	--	1,300	--
	11/24/92	26.63	67.85	320,000	--	35,000	43,000	4,200	22,000	--	1,600	ND
	4/5/93	23.77	70.71	270,000	--	50,000	58,000	4,600	25,000	--	1,800	ND
	7/21/93	24.51	69.97	FP	--	--	--	--	--	--	--	--
	11/9/93	26.06	68.42	FP	--	--	--	--	--	--	--	--
	8/30/95	21.73	72.75	FP	--	--	--	--	--	--	--	--
	12/4/95	21.94	72.54	FP	--	--	--	--	--	<200	--	--
	5/2/96	20.65	73.83	340,000	--	57,000	73,000	7,200	38,000	--	1,200	--
	11/5/96	24.29	70.19	270,000	--	43,000	56,000	4,500	34,000	--	--	--
	5/9/97	22.79	71.69	240,000	--	36,000	45,000	3,300	17,900	--	930	--
	11/5/97	25.06	69.42	240,000	--	42,000	48,000	3,600	18,800	<1,000	1,200	--
	2/9/98	22.64	71.84	220,000	--	47,000	60,000	5,200	29,800	<1,000	1,500	ND
	5/1/98	19.95	74.53	160,000	--	35,000	42,000	2,800	16,000	<1,000	1,100	ND
	11/3/98	23.29	71.19	200,000	--	39,000	49,000	4,400	26,000	<500	1,200	ND
	3/24/99	22.30	72.18	FP	--	--	--	--	--	--	--	--
	7/1/99	22.70	71.78	FP	--	--	--	--	--	--	--	--
	9/21/99	23.81	70.67	FP	--	--	--	--	--	--	--	--
	2/9/00	23.95	70.59	FP	--	--	--	--	--	--	--	--
MW-2	3/1/91	27.86	66.95	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
94.81	11/24/92	27.91	66.90	<50	--	<0.5	1.1	<0.5	1.5	--	<1.0	ND
	4/5/93	25.95	68.86	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	7/21/93	25.59	69.22	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	11/10/93	26.72	68.09	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	8/30/95	25.75	69.06	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	--
	5/3/96	23.28	71.53	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	5/8/97	24.58	70.23	<50	--	<0.5	0.7	<0.5	<0.5	--	<1.0	--
	4/29/98	22.18	72.63	<50	--	<0.5	<0.5	<0.5	<0.5	<2	<1.0	ND

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Table 2. Groundwater Elevation and Analytical Data: Volatile Hydrocarbons and HVOCs

Connell Automobile Dealership, 3093 Broadway, Oakland, California

Well ID TOC Elev. (ft)	Sampling Date	Depth to Groundwater (ft)	Groundwater Elevation (ft)	←-----ug/l----->								
				TVH	TPHg	Benzene	Toluene	Ethyl - benzene	Xylenes	MTBE	1,2-DCA	Other HVOCs
MW-3 90.08	3/1/91	23.17	66.91	<50	--	<50	0.6	<0.5	<0.5	--	<1.0	ND
	11/25/92	23.01	67.07	50	--	<0.5	0.9	<0.5	2	--	<1.0	ND
	4/5/93	22.11	67.97	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	7/21/93	23.93	66.15	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	11/10/93	23.14	66.94	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	8/30/95	20.61	69.47	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	--
	5/3/96	18.43	71.65	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	5/8/97	19.77	70.31	<50	--	<0.5	0.7	<0.5	<0.5	--	<1.0	--
	4/29/98	17.92	72.16	<50	--	<0.5	<0.5	<0.5	<0.5	<2	<1.0	ND
MW-4 88.84	3/1/91	23.79	65.05	150,000	--	20,000	38,000	2,800	14,000	**	610	ND
	10/12/92	22.48	66.36	230,000	--	15,000	32,000	2,500	14,000	--	430	--
	11/24/92	22.60	66.24	210,000	--	14,000	31,000	2,500	14,000	--	500	ND
	4/2/93	20.11	68.73	FP	--	--	--	--	--	--	--	--
	7/21/93	20.48	68.36	FP	--	--	--	--	--	--	--	--
	11/9/93	21.71	67.13	FP	--	--	--	--	--	--	--	--
	8/30/95	19.90	68.94	FP	--	--	--	--	--	--	--	--
	12/1/95	19.40	69.44	FP	--	--	--	--	--	--	--	--
	5/2/96	17.50	71.34	140,000	--	24,000	50,000	3,000	15,100	--	420	ND
	11/4/96	20.13	68.71	160,000	--	16,000	38,000	2,700	14,000	--	380	ND
	5/8/97	18.63	70.21	170,000	--	16,000	37,000	2,400	15,900	--	290	--
	11/5/97	20.19	68.65	190,000	--	15,000	31,000	2,200	14,600	<400	290	--
	2/9/98	18.28	70.56	110,000	--	19,000	42,000	2,500	18,300	<500	300	--
	5/1/98	16.11	72.73	130,000	--	15,000	31,000	2,000	13,400	<1,000	260	ND
	8/4/98	17.54	71.30	130,000	--	16,000	34,000	2,400	15,700	<400	240	ND
	11/2/98	19.21	69.63	140,000	--	16,000	32,000	2,300	15,500	<400	230	ND
	3/26/99	17.51	71.33	110,000	--	15,000	30,000	1,600	15,000	450 ⁴	210	⁵
	7/1/99	18.80	70.04	110,000	--	13,000	23,000	1,600	12,000	<83	170	⁵
	9/21/99	19.85	68.99	140,000	--	16,000	31,000	2,400	14,800	ND	<1000	⁵
	2/9/00	19.76	69.08	--	140,000	16,000	28,000	2,100	14,000	<400	100	DCB: 5.9, MCB: 5.9

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Table 2. Groundwater Elevation and Analytical Data: Volatile Hydrocarbons and HVOCs

Connell Automobile Dealership, 3093 Broadway, Oakland, California

Well ID	Sampling Date	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TVH	TPHg	Benzene	Toluene	Ethyl - benzene	Xylenes	MTBE	1,2-DCA	Other HVOCs
TOC Elev. (ft)				-----ug/l----->								
MW-5	3/15/91	26.31	58.53	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
84.84	11/10/92	26.83	58.01	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	4/2/93	26.62	58.22	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	7/21/93	26.60	58.24	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	11/9/93	27.24	57.60	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	8/30/95	27.46	57.38	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	--
	5/3/96	26.02	58.82	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	5/8/97	26.76	58.08	<50	--	<0.5	0.5	<0.5	<0.5	--	<1.0	--
	4/29/98	26.55	58.29	<50	--	<0.5	0.5	<0.5	<0.5	<2	<1.0	ND
MW-6	3/15/91	25.82	59.80	80,000	--	12,000	13,000	1,100	5,400	--	1,400	DBCM: 160
85.62	10/12/92	25.02	60.60	19,000	--	3,200	1,400	200	560	--	840	--
	12/1/92	28.87	56.75	FP	--	--	--	--	--	--	--	--
	4/2/93	26.96	58.66	FP	--	--	--	--	--	--	--	--
	7/21/93	26.17	59.45	FP	--	--	--	--	--	--	--	--
	11/9/93	27.51	58.11	FP	--	--	--	--	--	--	--	--
	8/30/95	28.00	57.62	FP	--	--	--	--	--	--	--	--
	12/1/95	27.58	58.04	FP	--	--	--	--	--	<8,000,000	71	--
	86.94	5/3/96	28.15	58.79	130,000	--	37,000	50,000	3,200	14,200	--	2,400
85.82	5/9/97	26.54	60.40	1,700,000	--	14,000	27,000	4,000	28,200	--	1,200	--
	11/5/97	26.16	60.78	160,000	--	13,000	19,000	1,900	14,300	<200	790	--
	5/1/98	22.96	62.86	130,000	--	15,000	23,000	1,700	13,200	<500	1,100	ND
85.82	11/3/98	24.35	61.47	110,000	--	17,000	21,000	1,800	10,700	<200	990	ND
	3/26/99	23.82	62.00	FP	--	--	--	--	--	--	--	--
	7/1/99	24.45	61.37	FP	--	--	--	--	--	--	--	--
	9/21/99	24.58	61.24	FP	--	--	--	--	--	--	--	--
	2/9/00	24.93	61.24	FP	--	--	--	--	--	--	--	--

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Table 2. Groundwater Elevation and Analytical Data: Volatile Hydrocarbons and HVOCs

Connell Automobile Dealership, 3093 Broadway, Oakland, California

Well ID TOC Elev. (ft)	Sampling Date	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TVH	TPHg	Benzene	Toluene	Ethyl -		MTBE	1,2-DCA	Other HVOCs
								benzene	Xylenes			
-----> ug/l <-----												
MW-7 85.41	3/15/91	21.63	63.78	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	11/24/91	21.52	63.89	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	4/2/93	20.08	65.33	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	7/21/93	19.59	65.82	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	11/9/93	20.65	64.76	<50	--	<0.5	1	<0.5	1.7	--	<1.0	ND
	8/30/95	18.78	66.63	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	--
	12/1/95	19.47	65.94	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	5/2/96	17.15	68.26	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	8/8/96	18.48	66.93	<50	--	<0.5	<0.5	<0.5	<0.5	<2	<1.0	ND
	11/4/96	18.69	66.72	<50	--	<1	<1	<1	<1	--	<1.0	ND
	2/6/97	17.44	67.97	<50	--	<0.5	<0.5	<0.5	<0.5	<2	<1.0	ND
	5/8/97	17.72	67.69	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	--
	8/7/97	18.49	66.92	<50	--	<0.5	<0.5	<0.5	<0.5	<2	<1.0	ND
	11/5/97	18.86	66.55	<50	--	<0.5	<0.5	<0.5	<0.5	<2	1	--
	2/9/98	17.56	67.85	<50	--	<0.5	<0.5	<0.5	<0.5	<2	<1.0	--
	4/29/98	16.23	69.18	<50	--	<0.5	<0.5	<0.5	<0.5	<2	<1.0	ND
	8/4/98	17.24	68.17	<50	--	<0.5	<0.5	<0.5	<0.5	<2	1.1	ND
	11/2/98	17.91	67.50	<50	--	<0.5	<0.5	<0.5	<0.5	<2	1.2	ND
	3/26/99	16.42	68.99	<50	--	<0.5	<0.5	<0.5	<0.5	<2	ND	ND
	7/1/99	17.90	67.51	85	--	<0.5	1.1	0.55	2.5	<0.5	1.0	⁵
	9/21/99	18.91	66.50	<50	--	0.7	1.8	<0.5	1.5	<5.0	<5.0	ND
	2/9/00	16.74	68.67	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<0.5
MW-8 85.50	10/12/92	27.70	57.80	70	--	20	1	1	3	--	210	--
	11/25/92	27.62	57.88	<50	--	<0.5	<0.5	<0.5	<0.5	--	200	ND
	4/8/93	26.64	58.86	490	--	15	45	5.1	73	--	210	ND
	7/21/93	26.60	58.90	180	--	2.5	3	<0.5	1.9	--	350	ND
	11/11/93	27.18	58.32	310	--	23	<0.5	<0.5	<0.5	--	240	ND
	8/31/95	26.35	59.15	660	--	360	6.8	13	2.8	--	130	--
	12/4/95	26.72	58.78	250	--	46	0.9	4.9	<0.5	--	94	ND

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Table 2. Groundwater Elevation and Analytical Data: Volatile Hydrocarbons and HVOCs

Connell Automobile Dealership, 3093 Broadway, Oakland, California

Well ID	Sampling Date	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TVH	TPHg	Benzene	Toluene	Ethyl - benzene	Xylenes	MTBE	1,2-DCA	Other HVOCs	
TOC Elev. (ft)				←-----ug/l----->									
	5/3/96	25.47	60.03	69	--	110	<0.5	<0.5	1.5	--	100	ND	
	8/8/96	26.41	59.09	120	--	11	<0.5	<0.5	<0.5	<2	93	ND	
	11/5/96	26.77	58.73	110	--	20	<1	1	<1	--	98	ND	
	2/6/97	25.84	59.66	67 ^{1,2}	--	51	<0.5	0.56	<0.5	<2	81	ND	
	5/9/97	26.39	59.11	110 ^{1,2}	--	59	<0.5	<0.5	<0.5	--	76	--	
	8/7/97	26.72	58.78	<50	--	12 ³	<0.5	<0.5	<0.5	<2	79	ND	
	11/5/97	26.82	58.68	<50	--	9.4	<0.5	<0.5	<0.5	<2	84	--	
	2/9/98	25.57	59.93	<50	--	6	<0.5	<0.5	<0.5	<2	85	--	
	5/1/98	25.64	59.86	430	--	490	7.1	27	26	<10	85	ND	
	8/5/98	25.96	59.54	140	--	19	<0.5	5.2	5.3	<2	69	ND	
	11/3/98	26.27	59.23	150	--	110	1.1	4.3	4.5	<2	67	ND	
	3/31/99	20.93	64.57	54	--	170	1.5	4.1	1.9	4.4 ⁴	5.9	1,1 DCA: 0.7	
	7/1/99	26.59	58.91	140	--	58	0.9	3	2.3	<0.5	55	⁵	
	9/21/99	26.89	58.61	670	--	170	2.6	11	7.9	<5	41	ND	
	2/9/00	26.60	58.90	--	300	60	1.2	4.8	1.2	<5.0	40	<0.5	
MW-9	11/24/92	23.51	66.86	19,000	--	180	590	23	2000	--	340	TCM: 15	
90.37	4/5/93	21.14	69.23	2,300	--	48	4	0.6	13	--	600	TCM: 2	
	7/21/93	21.54	68.83	2,300	--	170	8.1	15	<0.5	--	1100	ND	
	11/10/93	27.53	62.84	4,400	--	69	7.3	21	9.7	--	900	ND	
	8/30/95	19.59	70.78	3,200	--	3,900	49	80	22.8	--	960	--	
	12/4/95	20.65	69.72	--	--	--	--	--	--	<2	--	--	
	5/2/96	18.63	71.74	<1300	--	2,600	<13	200	<13	--	550	ND	
	11/5/96	20.69	69.68	1,800	--	280	<5	65	<5	--	770	ND	
	5/9/97	19.96	70.41	1,100	--	160	<0.5	42	<0.5	--	690	--	
	8/8/97	20.84	69.53	570 ^{1,2}	--	<0.5	<0.5	<0.5	0.78 ³	<2	680	ND	
	11/5/97	21.55	68.82	490 ¹	--	<0.5	<0.5	6	<0.5	<2	500	--	
	2/9/98	20.21	70.16	270 ¹	--	48	17	5.8	<0.5	<2	520	--	
	5/1/98	19.27	71.10	550	--	70	<0.5	22	2.2	<2	390	ND	
	8/5/98	19.35	71.02	550 ¹	--	88	<0.5	13	1.9 ³	<2	420	ND	

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Table 2. Groundwater Elevation and Analytical Data: Volatile Hydrocarbons and HVOCs

Connell Automobile Dealership, 3093 Broadway, Oakland, California

Well ID	Sampling Date	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TVH	TPHg	Benzene	Toluene	Ethyl - benzene ug/l	Xylenes	MTBE	1,2-DCA	Other HVOCs
	11/2/98	20.43	69.94	580	--	<0.5	<0.5	7.5 ³	1.6 ³	<2	430	ND
	3/25/99	18.46	71.91	1,100	--	160	<0.5	21	2.1 ³	5.7 ⁴	550	ND
	7/1/99	19.95	70.42	540	--	100	7.4	26	16.9	<1.3	400	⁵
	9/21/99	21.15	69.22	2,700	--	320	98	88	47	<20	540	ND
	2/9/00	21.08	69.29	--	1,600	81	3.6	19	18	<5.0	360	<0.5
MW-10	10/12/92	21.55	67.05	28,000	--	2,700	3,800	210	1,300	--	150	--
88.60	11/24/92	21.86	66.74	130,000	--	9,700	19,000	1,400	8,400	--	370	ND
	4/5/93	19.14	69.46	63,000	--	6,300	14,000	1,100	7,500	--	70	ND
	7/21/93	19.79	68.81	140,000	--	16,000	31,000	2,200	13,000	--	700	ND
	8/30/95	17.99	70.61	92,000	--	13,000	24,000	1,800	9,100	--	300	--
	5/3/96	17.04	71.56	81,000	--	17,000	29,000	2,100	8,500	--	320	ND
	5/9/97	18.36	70.24	63,000	--	7,400	13,000	940	4,100	--	150	--
	5/1/98	15.84	72.76	60,000	--	7,100	14,000	1100	5,300	<250	120	ND
MW-11	11/24/92	33.65	68.41	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
102.06	2/8/92**	33.37	68.69	<50	--	<0.1	<0.1	<0.1	<0.1	--	--	--
	12/8/92	33.37	68.69	<50	--	<0.5	<0.5	<0.5	<0.5	--	--	--
	4/5/93	31.03	71.03	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	7/21/93	31.90	70.16	160	--	<0.5	1.8	<0.5	<0.5	--	<1.0	ND
	11/9/93	32.60	69.46	80	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	8/30/95	28.92	73.14	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	--
	5/3/96	28.00	74.06	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	5/8/97	29.93	72.13	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	--
	4/29/98	27.22	74.84	<50	--	<0.5	<0.5	<0.5	<0.5	<2	<1.0	ND
MW-13	11/24/92	26.05	58.01	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
84.06	2/8/92**	25.08	58.98	<50	--	<0.1	<0.1	<0.1	<0.1	--	--	--
	12/8/92	25.08	58.98	<50	--	<0.5	<0.5	<0.5	<0.5	--	--	--
	4/5/93	24.64	59.42	<50	--	<0.5	0.9	<0.5	<0.5	--	<1.0	ND

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Table 2. Groundwater Elevation and Analytical Data: Volatile Hydrocarbons and HVOCs

Connell Automobile Dealership, 3093 Broadway, Oakland, California

Well ID TOC Elev (ft)	Sampling Date	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TVH	TPHg	Benzene	Toluene	Ethyl - benzene	Xylenes	MTBE	1,2-DCA	Other HVOCs
	7/21/93	24.29	59.77	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	11/9/93	24.23	59.83	<50	--	<0.5	<0.5	<0.5	<0.5	--	<1.0	ND
	8/30/95	23.30	60.76	<50	--	49	<0.5	<0.5	<0.5	--	3.6	--
	12/1/95	23.80	60.26	<50	--	<0.5	<0.5	<0.5	<0.5	--	4.1	ND
	5/3/96	23.19	60.87	<50	--	<0.5	<0.5	<0.5	<0.5	--	4	ND
	8/8/96	23.44	60.62	<50	--	32	<0.5	<0.5	<0.5	<2	6.4	ND
	11/5/96	24.04	60.02	<50	--	<1	<1	<1	<1	--	5.7	ND
	2/6/97	23.24	60.82	<50	--	<0.5	<0.5	<0.5	<0.5	<2	3.5	ND
	5/8/97	23.46	60.60	<50	--	81	<0.5	<0.5	<0.5	--	5.5	--
	8/8/97	23.92	60.14	<50	--	<0.5	<0.5	<0.5	<0.5	<2	6.8	ND
	11/5/97	24.27	59.79	<50	--	<0.5	<0.5	<0.5	<0.5	<2	5.5	--
	2/9/98	22.89	61.17	<50	--	<0.5	<0.5	<0.5	<0.5	<2	2.9	--
	4/29/98	22.27	61.79	<50	--	24	<0.5	<0.5	<0.5	<2	5.7	ND
	8/4/98	22.75	61.31	120	--	200	<1	<1	<1	<4	6.2	ND
	11/3/98	23.90	60.16	59 ¹	--	33	<0.5	<0.5	<0.5	<2	6.1	ND
	3/31/99	23.11	60.95	130	--	0.56	<0.5	<0.5	<0.5	<2	1.4	ND
	7/1/99	23.40	60.66	160	--	370	19	1.2	3.5	<1	4.2	⁵
	9/21/99	21.91	62.15	370	--	150	1.0	0.8	0.8	<5.0	<5.0	ND
	2/9/00	23.84	60.22	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	2.1	<0.5
MW-14	5/26/98	21.67	72.99	41,000	--	7,100	11,000	720	3,900	<1000	440	ND
94.66	7/1/99	22.95	71.71	FP	--	--	--	--	--	--	--	--
	9/21/99	24.26	70.40	FP	--	--	--	--	--	--	--	--
	2/9/00	24.13	70.53	--	92,000	12,000	17,000	1,300	8,700	<140	450	<0.5
MW-15	5/26/98	21.87	72.89	130,000	--	30,000	38,000	2,500	12,600	<1000	1,200	ND
94.76	7/1/99	22.25	72.51	FP	--	--	--	--	--	--	--	--
	9/21/99	24.12	70.64	FP	--	--	--	--	--	--	--	--
	2/9/00	24.42	70.34	--	180,000	32,000	37,000	2,800	14,000	<200	1,100	<0.5

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Table 2. Groundwater Elevation and Analytical Data: Volatile Hydrocarbons and HVOCs

Connell Automobile Dealership, 3093 Broadway, Oakland, California

Well ID	Sampling	Depth to	Groundwater	TVH	TPHg	Benzene	Toluene	Ethyl -	Xylenes	MTBE	1,2-DCA	Other HVOCs
<i>TOC Elev.</i>	Date	Groundwater	Elevation					benzene				
<i>(ft)</i>		(ft)	(ft)					ug/l				

Abbreviations and Notes:

ug/l = micrograms per liter = parts per billion = ppb

TVH = Total Volatile Hydrocarbons

TEH = Total Extractable Hydrocarbons

MTBE = Methyl tert-butyl ether

* = Suspect laboratory contamination contributing to test result.

** = Fuel fingerprint analysis indicates MTBE is not present in the free product sample collected from this well.

*** = Duplicate sample sent to a different chemical laboratory.

DCB = 1, 3 Dichlorobenzene

MCB = Chlorobenzene

ND = none detected above laboratory reporting limit, see laboratory report for individual reporting limits.

1,2-DCA = 1,2 Dichloroethane

TPHg = Total petroleum hydrocarbons as gasoline

HVOCs = Halogenated volatile organic compounds by EPA Method 8010

TOC Elev. (ft) = Top of casing elevation in feet above mean sea level

DBCM = Dibromochloromethane

TCM = Chloroform = trichloromethane

<0.5 = Chemical not present at a concentration in excess of detection limit shown

MW-1 was initially referred to as Sample 5

-- = Sample not analyzed

FP = Free product encountered in well

1 = Sample exhibits fuel pattern which does not resemble standard

2 = Lighter hydrocarbons than indicated standard

3 = Presence of this compound confirmed by second column, however, the confirmation concentration differed from the reported result by more than a factor of two

4 = detection may potentially be a false positive, to be checked during the next event.

5 = One or more of the following substances found: Acetone, 1,2-Dibromoethane, Ethylbenzene, Styrene, Isopropylbenzene, Propylbenzene, 1,3,5-Trimethylbenzene, 2-Chlorotoluene, 1,2,4-Trimethylbenzene, n-Butylbenzene, and Naphthalene. See laboratory results for details.

1,1 DCA = 1,1 Dichloroethane

TOC Elev. (ft) = Top of casing elevation, surveyed to an arbitrary datum